



A shin guard to be proud of

Design by Asli Demir

Text by Pieter Desmet

The Philistine giant Goliath was an awe-inspiring sight. Standing nearly three meters tall, he towered over everyone else. His armour was formidable: a massive shield, a long spear, and a weighty sword. His bronze helmet, chainmail and shin guards glistened in the sunlight. In ancient Greece, warriors would wear such shin guards for protection during hand-to-hand combat. They were meticulously crafted and cost a fortune. The higher the status, the more exquisite the shin guards would be. And Goliath's were truly magnificent. Of course, it is well-known that he was ultimately defeated by the young David, but it should be noted that his shin guards were not to blame.



Image 1. Foot and leg prostheses

Vulnerable shins

In modern times, shin guards are no longer forged from copper, but they continue to be widely used. Think of high-risk professions like law enforcement, as well as contact sports like hockey, karate, and baseball. In professional football, they are even a mandatory accessory. The reason is evident: they protect the vulnerable shins against pain and injuries. But what if you have a prosthesis instead of a

living leg? Then a shin guard has nothing to offer – or so I thought. After all, a prosthesis doesn't have the vulnerability of a living shinbone. Designer Asli Demir (2022) proved me wrong. She designed shin guards specifically tailored for preteens with leg prostheses. Because, as she discovered, even for that group, unnecessary pain can be prevented with proper protection.

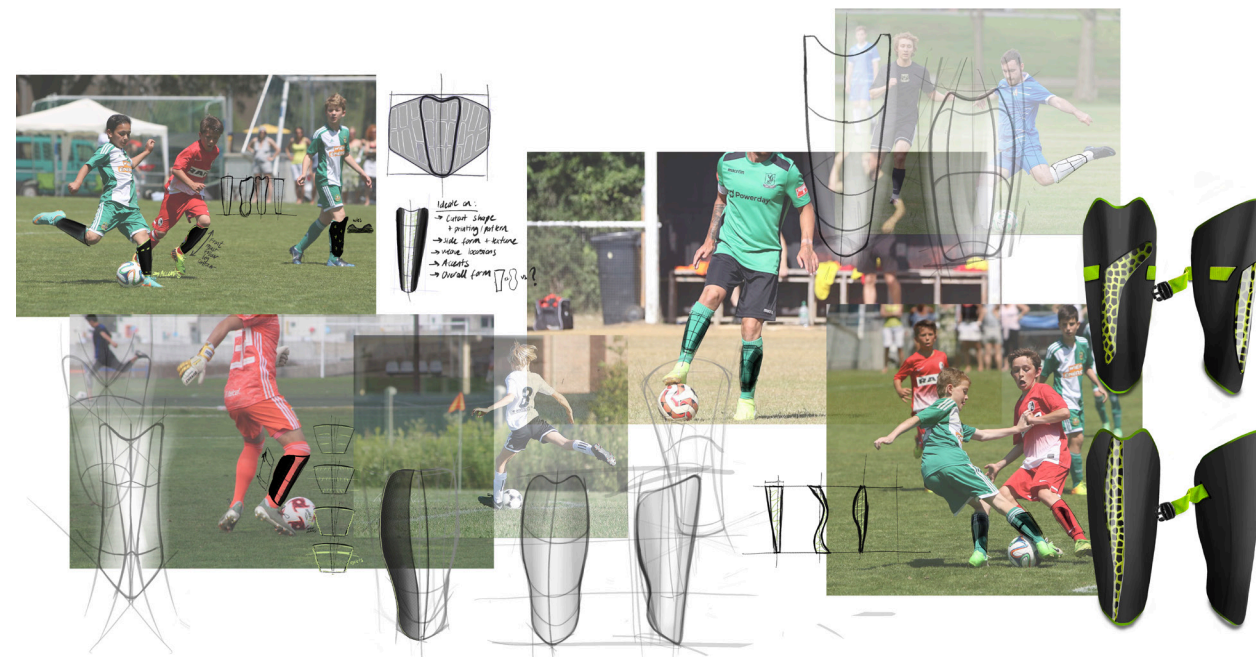


Image 2. Design sketches

Preteens

Being a “preteen” (8-12 years old) is an exhilarating phase of life. It is a time of self-discovery: who am I, where do I fit in the world, and how do I relate to others? Due to their fragile social identity, preteens are often highly sensitive to the opinions of their peers. This vulnerability is even more pronounced for preteens with limb differences, whether they are congenital or the result of amputation. In the Netherlands, there are approximately 230 individuals in this category (Rijnders et al., 2000). For mobility and social participation, they often rely on foot and leg prostheses. While a good prosthesis

can significantly enhance functionality, its appearance diverges strongly from that of a natural leg. This divergence becomes particularly sensitive during this stage of life. Asli asked herself the question: How can a leg prosthesis contribute to the self-confidence and emotional well-being of preteens? Her objective was to design something that would empower preteens to exert greater control over how they present their prosthesis, striking a balance between ‘blending in’ and ‘expressing your unique style.’



Social and physical protection

During her research, Asli uncovered a particularly delicate situation: during football. This is where social insecurity often takes hold. Your prosthesis becomes highly visible in the locker room and on the field. While there are specialized sport prostheses that exude a bold and athletic appearance, most children opt for regular prostheses when engaging in sports for various reasons. Sports prostheses tend to be costly and are difficult to obtain for use in recreational mixed sports. However, even regular prostheses present their own set of challenges. In team sports, they are often viewed as a potential risk, as they can inadvertently cause harm or injury to teammates and often are prohibited in contact sports starting at teenage years. Needless to say, this exacerbates an already socially sensitive situation.



Image 3. The shin guard in use

A familiar appearance

Asli designed a prosthetic cover that resembles a shin guard. When worn, the cover metamorphoses the prosthesis into a “football leg”. Just like your peers, you put on your shin guard while changing. This instils confidence in several ways. Firstly, it is immediately recognized as sports equipment, seamlessly blending in with the football context. Secondly, the robust act of “putting it on,” allows you to partake in a shared ritual with your teammates. Thirdly, the design ensures effective protection for teammates, thanks to a flexible middle layer that absorbs impact. You can wholeheartedly engage in the game without the concern of inadvertently causing harm to a teammate. And lastly, the cover contributes to a stylish and athletic appearance.

Beyond the prosthesis

Asli gathered an impressive amount of information. She studied the literature and consulted with experts. However, her most significant source was a boy from her target audience. This proved to be a greater challenge than she had anticipated. During their initial meeting, he displayed unexpected coolness and reserve. What was the reason? Children with limb differences are often approached by interested researchers. Regardless of good intentions, it can be stigmatizing to be questioned about one’s disability, reduced to being an “object of study.” Asli learned the importance of letting go. She realized the need to ask less goal-oriented questions and embrace the dynamics of open conversation: “It was only when I stopped focusing on his disability that a space for connection emerged.” This experience taught her that, as a designer, it is crucial not to take yourself too seriously. A lesson Goliath had not learned. He was overconfident, while Asli demonstrated courage with a service-oriented attitude. The outcome was a shin guard to be proud of.



Asli Demir developed the shin guard in 2022 as part of her graduation project in collaboration with Össur for the master’s program in Integrated Product Design. Her supervisors were Haian Xue, Maurizio Filippi (TU Delft), and Joana Braga (Össur Design Studio). Prior to her studies in Delft, Asli studied at the Massachusetts Institute of Technology (MIT; Mechanical Engineering).

Colophon

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