

# THE AFRO HAIR COMB INSPIRED BY PRINTING

Swansea-based engineer Dr Youmna Mouhamad is using her R&D experience to invent a hair comb designed to make looking after textured hair easier and less painful.

During her PhD in polymer physics, Youmna nannied for a young girl named Hazel who had long, thick, afro-textured hair. Like many other children, Hazel would cry from pain and frustration when her mother detangled her hair, even though she took extra care to part it into sections and apply conditioner beforehand. For women, the discomfort of this lengthy process can also be a reason to skip or delay their own hair care later in life, knocking confidence as a result.

This is what inspired Youmna to develop the Nyfasi Deluxe Detangler, a comb specially designed to coat hair with conditioner while detangling, to make the whole process more manageable and pain-free. "My dream is for women and girls to experience the joy of natural hair. I want to redefine hair care, for young girls like Hazel, as an intimate moment when they can connect with their mothers, and for women, as a celebration of themselves," says Youmna.

After her PhD, Youmna became a research engineer at Swansea University, exploring the use of traditional printing techniques with conductive inks to print solar panels and electrical components. Most of the projects she worked on involved commercialising new technologies, which sparked an interest in product commercialisation, business management and marketing. Eventually, she started using her scientific skills and creativity to solve a problem close to her heart: the pain and frustration Black women experience when caring for their hair.

Inspired by flexography printing, a widely used technique to print on paper and thin plastic films (like food packaging), Youmna



**Left: Dr Youmna Mouhamad with her invention. Right: The Nyfasi Deluxe Detangler**

designed a mechanism for the detangler that enables the application and distribution of conditioner. In flexography printing, a stamp mounted on a rotating cylinder is dipped into an ink reservoir and then brought in contact with the paper, enabling the ink on the stamp to be transferred onto the paper. The mechanism of the detangler is very similar – replacing the ink with conditioner, and the paper with hair.

For two years, Youmna worked on the project as a side hustle, building a minimum viable version of the Deluxe Detangler and registering UK and international patents. Then, in 2020, she was awarded an Enterprise Fellowship from the Royal Academy of Engineering, officially marking her transition to entrepreneurship. With the Enterprise Fellowship's support, Youmna was able to refine the detangler's design, improve user experience and develop its packaging. "The Fellowship has been a life-changing opportunity. It empowered me with the time, funds and knowledge to

accelerate a good idea into a great product and a viable startup."

Innovation and community are essential values for Youmna and her business. She engaged with 50 women during the product development. "For me, it was necessary to really understand women's challenges and concerns; and to develop the detangler with them, not just for them," says Youmna, who is currently raising funds to launch production of the detangler in the UK as part of her startup, Myana Naturals Ltd.

Youmna also recognises the importance of nurturing the next generation and empowering others. "My biggest challenge was my lack of self-confidence," she says, having struggled with imposter syndrome. Once the detangler is launched, she plans to use 5% of Myana Naturals' profits to unlock the potential of young people and build confident young women through one-to-one coaching, and ultimately sees the Deluxe Detangler as a tool to enable women to love and appreciate their hair.