

Problem description

Across Philips shavers and groomers, multiple button interface designs exist, differing in geometry, tactile feel, materials, travel distance, and integration with waterproof housings. This diversity increases design complexity, manufacturing variation, and user inconsistency. The assignment aims to develop a universal button interface concept that can be applied across several product families. The student will explore mechanical design opportunities for a unified button mechanism, considering sealing, ergonomics, actuation forces, material selection, and long-term reliability.

Relevance

A standardized button interface reduces development effort, improves cross-platform consistency, and supports cost efficiency in manufacturing. It also enhances user experience by creating a familiar and predictable interaction across different grooming products. This topic allows the student to work on mechanical component design, tactile behavior, waterproofing considerations, force modelling, and validation of user-interface elements

Aimed output

- Analyze current button designs used across multiple shaver and groomer product lines.
- Identify shared requirements: actuation force, travel, durability, IPX sealing, manufacturability.
- Develop several concept proposals for a universal button design.
- Create CAD models and evaluate feasibility across different handle geometries.
- Perform force and deformation simulations using ANSYS (e.g., tactile dome behavior, rubber membrane stress, waterproof sealing compression).
- Investigate materials, membrane designs, tactile domes, and waterproofing solutions.
- Prototype selected concepts and test tactile response, sealing, robustness, and usability.
- Deliver final design recommendations supported by simulation results, test data, and manufacturability assessment.

Initiator/Supervisor: Sophia De-Stefano

Type of assignment: graduation project / master thesis

Desirable duration: 6 Months

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