Research and Development of Onpery's Absorbent Menstrual Innerwear

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Overview Writeup

Pramod Priya Ranjan, at his co-founded venture Care Form Labs Pvt Ltd with trademark Onpery, codesigned and co-developed a utility patent filed for External Menstrual Wear, that has better usability, ergonomics and economics.

The project started in 2021 and the final design version is expected to be implemented in social spaces in 2025.

Background and Need for Innovation:

Menstrual hygiene products such as disposable sanitary napkins and tampons contribute to environmental waste and pose health risks due to chemical exposure. Traditional external products also often cause leakage, discomfort, odor, rashes, and chafing. Additionally, biodegradable options remain costly and less accessible for many users.

Reusable menstrual products, such as period underwear and reusable napkins, attempt to address these challenges but face issues related to cleaning, drying, fit (shifting and crumbling), leakages, and absorption variability. Recognizing these gaps, Pramod and his team designed the Absorbent Innerwear, which offers a modular, ergonomic, and economical alternative.

Design and Development:

The Absorbent Innerwear is an external menstrual wear designed for different levels of vaginal discharge, including menstrual flow, spotting, and daily discharge.

There are two variants of the design:

- Variant 1 is made of flaps, to attach the absorbent part to the underwear.
- Variant 2 is made of buttons, to attach the absorbent part to the underwear.



Image of Onpery Absorbent Menstrual Innerwear Article (Variant 1 – Flaps) & (Variant 2 – Buttons)

It consists of the following components:

Modular Design:

- Offers customizable absorbency levels based on the user's needs.
- Allows for interchangeable inserts with different absorption capacities.
- Proprietary Locking Mechanism: Ensures the insert remains securely in place, preventing shifting and crumbling during use. Uses slits and button fasteners or flaps with additional locking mechanisms to prevent shifting or crumbling of the absorbent part.



Eco-Friendly and Cost-Effective:

- Can be reused for multiple cycles, reducing menstrual product expenses.
- Lowers environmental impact by eliminating single-use waste.

Absorbent Layers:

- Top Layer: Moisture-wicking fabric to keep the user dry.
- Middle Layer: Highly absorbent material that prevents leakage.
- Bottom Layer: Liquid-proof layer to ensure protection.

Patent and Recognition:

The utility patent has been filed in India, with application number 202231019865.

Collaboration and Institutional Support:

The Absorbent Innerwear is supported through incubation by FITT, IIT Delhi, and through a grant by IIT Delhi Endowment Management Foundation.

IMPACT

- a. Comfort and Ergonomics
- The product eliminates the discomfort of bulky disposable napkins and offers a snug fit without crumbling or shifting.
- Unlike conventional period underwear, the modular insert system allows for easy replacement of the absorbent part without changing the entire garment.
- b. Hygiene and Sustainability
- Unlike tampons and menstrual cups, which require internal insertion, the Absorbent Innerwear is worn externally, making it accessible to those who prefer non-invasive menstrual solutions.
- The design reduces risk of infections, as it does not disrupt the vaginal pH like tampons.
- By eliminating plastic and chemical-based absorption materials, it minimizes landfill waste and supports sustainable menstruation practices.
- c. Economic and Social Impact
- The reusable nature of the product makes it a financially viable option for menstruators in lower-income communities.
- The innovation aligns with period poverty reduction efforts, ensuring accessibility and dignity in menstrual care.

Conclusion:

This innovative Absorbent Innerwear represents a breakthrough in external menstrual wear by combining comfort, sustainability, and affordability. With its customizable absorption, secure fit, and easy maintenance, it stands out as a game-changer in the menstrual health space. By addressing leakage, fit, and environmental concerns, this innovation paves the way for a more sustainable and inclusive approach to menstrual hygiene.

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