PATENT PROTECTION OF NON-WOVEN MATERIAL

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If someone had said that a liquid could be sprayed on the body and afterwards dry off to become ready - to - clothing, would it be rational to believe them?

In the past couple of years, technology has produced wonders that were even unthinkable. This is good news for anyone who prefers to wear classic pieces year after year rather than shifting their wardrobe. A Fabrican Spray on Fabric, developed by a Spanish fashion designer and a professor of particle technology, allows for the easy creation of clothing by just spraying it onto the skin. Unbelievable, yet it is true. Fabrican is in the forefront of material science innovation, creating "second skin" for the healthcare and cosmetics sectors, sprayable conductive fabrics, and smart fabrics incorporating nanotechnology.

Before jumping into the technicalities, lets understand the meaning of non-woven material, Nonwovens are defined by ***ISO standard 9092 and CEN EN 29092***,

"A nonwoven is an engineered fibrous assembly, primarily planar, which has been given a designed level of structural integrity by physical and/or chemical means, excluding weaving, knitting or paper making.". ***[i]***

In essence, nonwoven fabrics are products made of parallel laid, cross-laid or randomly laid webs bonded with the application of adhesive or thermoplastic fibers under application of heat and pressure.[ii]

Nonwovens are innovative, high-tech, engineered fabrics made from fibres. They are used in a wide range of consumer and industrial products either in combination with other materials or alone. Nonwovens are designed for their specific application, ranging from thin, light weight nonwovens to strong and durable nonwovens, be it consumer or industrial applications. The combination of their specific characteristics through the raw materials selection, the formation and bonding methods used or the applied finishing treatments, such as printing, embossing, laminating etc. allow to deliver high-performance products. The aerosol technology developed by Fabrican allows seamless materials to be sprayed directly onto the body.[iii]

It is anticipated that the technology will have inventive uses in the fashion sector. This technology, which combines science and fashion, has sparked the interest of many in the sector. This spray-on garment is the ideal example of how art and technology can coexist.

The spray-on fabric, which recently gained attention thanks to the appearance of the well-known model Bella Hadid at the Coperni SS23 fashion show during Paris Fashion Week, produces enticing scenes as the materials sprayed from a spray can instantaneously transformed into a clothing. “Fabrican” is a term coined for this unique spray-on fabric technique, which was first invented by Manel Torres in 2013. An aerosol can comprise a liquid suspension that can be sprayed using a spray gun to create instant fabric. [iv]

The same phenomenon was showcased by Bella Hadid at the Coperni SS23 Fashion when an instantaneous spray-on dress was created.[v]

APPLICATIONS OF NON-WOVENS IN THE INDUSTRY

Non-woven material is used in all possible sectors in our daily lives. Unlike any fancy item, non-woven is rather common in our daily lives. Below are few applications of them in regular mundane lives:

1. Nonwovens are a model material for the fashion industry. Used for many decades in hidden, support functions, such as interlinings and components of shoes and bags, today young designers are using nonwovens as a creative and versatile new material. The success of nonwovens is due to their versatility and the ability to engineer many different properties into them, such as shape-retention, adaptation to the characteristics of the out fabric, and lightness in weight. Today, the global retail sector is fascinated with the prospect of incorporating nonwoven fabrics in fashion, sports, and outdoor performance apparel as a means of providing something “different” to current woven and knitted apparel.

2. Nonwovens are extensively used in the medical field and in protection against biological agents in other sectors. For example, they can be designed to deliver critical safety properties, such as protection against infections and diseases. With today’s multi-drug resistant strains of bacteria and viruses, nonwovens can help in the fight against cross-contamination and the spread of infection in a medical or surgical environment. Because they are used only once and incinerated after use, the need for handling is avoided and the spread of contaminants is minimized. New nonwoven materials with improved finishes including liquid repellent, virus-proof and bacterial barrier properties have also been developed for

applications such as surgical masks, gowns, and drapes, especially in view of the high demands of the new European Standards, EN 13795.

3. Nonwovens are the ideal material for personal care products. They combine strength and softness, hygiene, and handiness. Some examples of where nonwovens are used: Absorbent Hygiene Products Wipes, skin care and Depilatory strips. Wipes are one of the typical things that are needed every day for a variety of uses. A wipe is a little cloth that is used for cleaning or disinfecting. Wipes made of nonwoven fabric have recently become more popular due to their great absorption and softness. They come in dry wipes and wet wipes and feature characteristics including superior moisture retention, smooth and soft texture, and sound absorption.

PATENT FILING TREND W.R.T. NON-WOVEN WIPES

Examining patent applications, their applicants, the jurisdictions in which they were filed, and other factors is one way to understand the direction of technology and investments. The top firms, technological filing trends, and countries with the most patent filings are all represented in the following charts.[i]

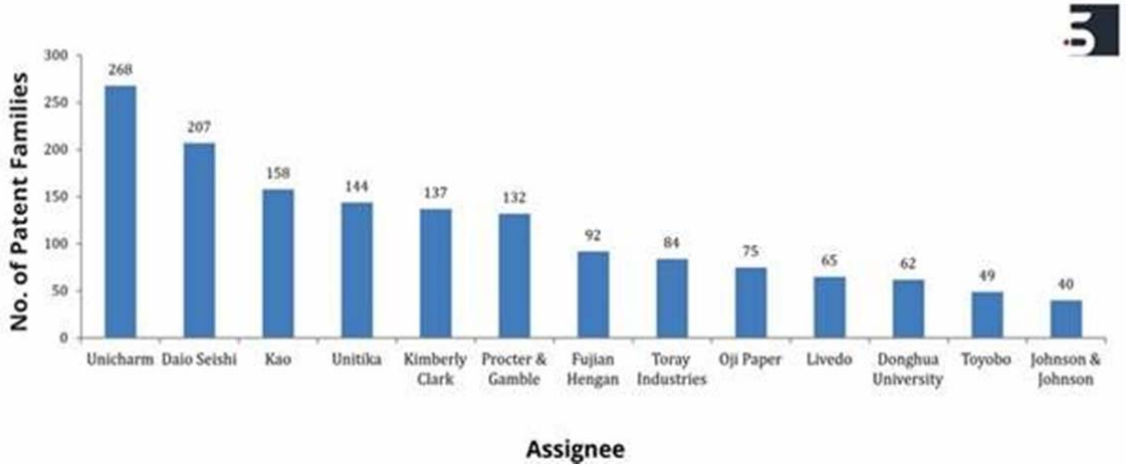

Chart 1: The top organisations that make up the top assignee list. It shows that the top assignee has made significant strides towards the nonwoven wipes industry.

The top assignees' filing patterns are shown above, with Unicharm having filed the most patents, followed by Daio Seishi, Kao, and Unitika. Also taking the top rank are Kimberly Clark, P&G, Fujjain Hengan, Toray Industry, and Oji paper. Additionally, among the top assignees for filing patents in the field of nonwoven wipes are Livedo, Dongua University, Toyobo, and J&J.

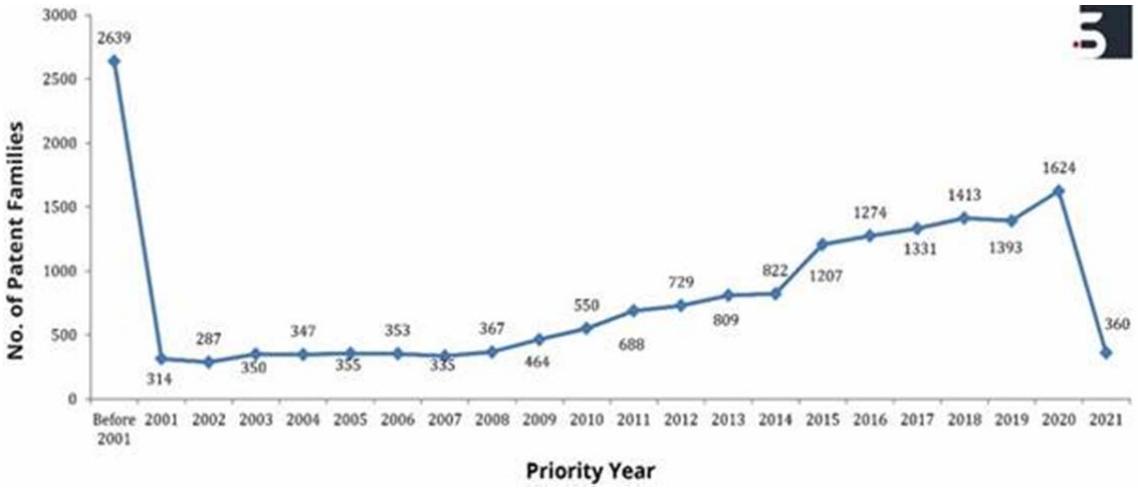

Chart 2: The filing trends in nonwoven wipe market from 2001 to 2021.

Worth noting: Since it typically takes 18 months for a patent application to be published in the public domain, the statistics for 2019–2021 may not be accurate.

As seen in Chart 2, since 2009, the filing trend has been rising steadily and more quickly. The growing awareness and desire for sustainability can be attributed as one factor in the constant increase in patent filings.

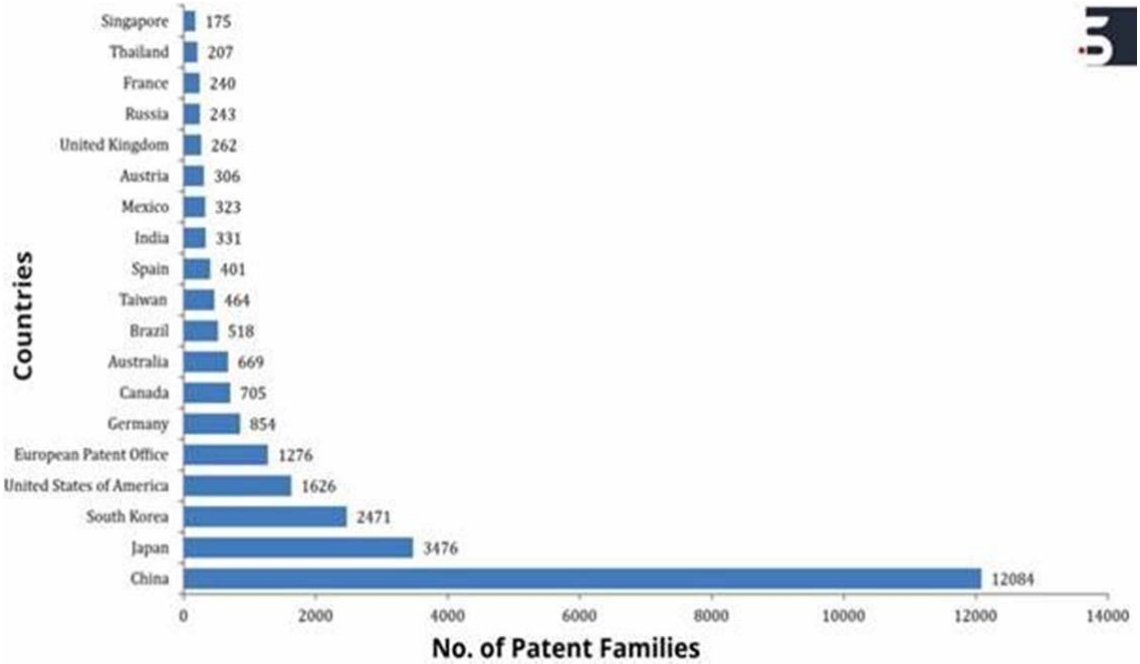

Chart 3: The distribution of patents by countries. The chart identifies the counties by the number of patent filings, thus, representing the origin of the research.

According to Chart 3, China, Japan, and Korea have the most filings, followed by the US, the European Union, and Germany. Also taking the top ranks are Canada, Australia, Brazil, Taiwan, and Spain. In terms of patent submissions, Mexico, Austria, the United Kingdom, Russia, France, Thailand, and Singapore are all ahead of India, which is currently ranked 12th.

As a result, it is imperative to comprehend the need for patent applications in the non-woven sector given that this is a lucrative marketable commodity. This fabric is created using a few distinct procedures that give it its distinctive features. A unique engineering technique is always used in addition to the composition, and specific performances are necessary for the composition to yield the desired results.

THE WAY FORWARD

What is clear however, is that the nonwovens industry continues to be adaptive, creative and relentlessly opportunistic. Words like sustainability, recycle, reduce and reuse, are more than buzzwords in the nonwoven's world, they are real. The ability to give consumers personalized products is made possible by the unique inventions in the industry. With the use of new developing technology, manufacturers can quickly alter the physical characteristics of their products, including as their size, shape, texture, colour, and even odour, to meet the needs of each individual customer without having to retool or keep a variety of material grades on hand.

In **2019**, the main market segments in terms of volume for nonwovens roll goods, were: hygiene (28.7%), wipes for personal care (12.3%), construction (9.8%), automotive (6.2%), civil engineering (5.4%), filtration (3.6%), and food & beverage (3.3%).[i] Seeing the recent statistics, it is safe to say that the market is only growing therefore rise is patent filing is to be expected.

In conclusion, non-woven materials are not an exception, and patent filing is required to prevent anyone from altering or tarnishing the image of the product. As it is a developing area, current improvements should be taken into account and businesses should capitalise on them to acquire a competitive advantage. Only patents can assist in the proper procedure.

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