Journal of Intellectual Property Rights
Vol 30, May 2025, pp 383-396
DOI: 10.56042/jipr.v30i3.10973

Innovating Beauty: Unveiling the Role of Patents in the Cosmetic Industry

Sinjini Sen and Niharika Sahoo Bhattacharya†
Rajiv Gandhi School of Intellectual Property Law, IIT Kharagpur, Kharagpur — 721 302, India

Received: 7th May 2024; revised: 31st December 2024

The cosmetics industry, once largely based in traditional herbal formulations, has undergone a paradigm shift fuelled by technological developments and constant consumer demands for efficacy. This paper presents a study on the multifaceted changes occurring in the cosmetics sector, focusing on the pivotal roles played by patents in product development and protection. The research design involves a comprehensive approach, blending doctrinal research with a systematic review of literature. A detailed examination of global patent databases provides insights into current innovations and the competitive landscape of the cosmetics industry. The data show that patents are concentrated among key stakeholders, reflecting the competitive nature of the sector. The dynamic aspect of the cosmetics market is reflected in ongoing advancements in active herbal cosmetics, cosmeceuticals, and nutraceuticals. Owing to the availability of effective cosmetics notable shift in consumer preferences is observed towards high-performance cosmetic products. In conclusion, this paper contributes valuable insights into the intersection of patents and the cosmetics industry. The study underscores the critical roles of patents in navigating innovation and market competition.

Keywords: Cosmetic, Beauty, Herbal, Cosmeceuticals, Technology, Patents

In the kaleidoscope of modern lifestyle, self-expression and self-care have elevated the significance of beauty to a pivotal position in our daily lives. Within this vogue of self-care, use of cosmetics is not something new. People have used cosmetics since the beginning of recorded human history. There is evidence of highly sophisticated self-beautification concepts and different cosmetic applications from ancient times that were based on conventional wisdom and natural ingredient derived from plants, minerals and animals. In ancient times, humans connected traditions, daily routines, and seasons (Rutus in Sanskrit).[1] For instance, in Chinese culture, the use of safflower and ochre for getting reddish pigments,[2] and other herbal remedies for better skin care was common. In Japan primitive use of cosmetics evolved from an aesthetic perspective.[3] In India as well a deep-rooted tradition of herbal cosmetics prevailed that has been facilitated through several systems of medicine, namely Ayurveda, Unani, Siddha, naturopathy, and homoeopathy.[4] Globally, people's desire to consciously look beautiful daily has made cosmetics a lucrative industry. Along with traditional cosmetics, innovations in skincare, makeup, and wellness, along with rising awareness of personal grooming and hygiene, are further contributing to this upward trend. As the beauty and personal care market continues to evolve, it is expected to grow at an annual rate of 3.33% (CAGR 2024-2028).[5] The global herbal beauty products market size was estimated at US$ 83.52 billion in 2021 and is expected to hit US$ 130.2 billion by 2030, foreseen to register a growth at a CAGR of 5.06% during the forecast period 2022 to 2030.[6] With this continuous expansion of the cosmetics industry, the range of cosmetic products has diversified far beyond traditional beauty creams. Understanding what constitutes cosmetics is essential, as this broadening of product categories has brought about varying definitions and classifications across different regions.

Cosmetics-Definition and Categorisation

The term Cosmetics encompass a very wide spectrum of products in a variety of product categories. The definition of cosmetics typically revolves around their intended use, such as cleaning, beautifying, or altering the appearance of the body, but there is no universally accepted standard. Different regulatory bodies interpret these definitions based on regional requirements and compliance standards, making it essential to navigate both technical innovations and regulatory frameworks. In USA cosmetic is regulated under the Federal Food, Drug & Cosmetic Act (FD&C Act United States Code, Title 21). Chapter VI of the cosmetic legislation deals with misbranded, adulterated

†Corresponding author: Email: niharika@rgsoipl.iitkgp.ac.in

cosmetics and regulations making exemptions of certain cosmetics. The term Cosmetics is defined under Section 201 (i) of the Act as "*articles intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or otherwise applied to the human body...for cleansing, beautifying, promoting attractiveness, or altering the appearance*."[7] Included in this definition are products such as skin moisturisers, perfumes, lipsticks, fingernail polishes, eye and facial makeup preparations, shampoos, permanent waves, hair colours, toothpastes, and deodorants, as well as any material intended for use as a component of a cosmetic product. In the European Union, EU Regulation 1223/2009 deals with cosmetics. The term cosmetics product is defined under Article 2.1.a., of the regulation as "*any substance or mixture intended to be placed in contact with the external parts of the human body (epidermis, hair system, nails, lips and external genital organs) or with the teeth and the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance, protecting them, keeping them in good condition or correcting body odours.*"[8] In India cosmetics is regulated under Drugs and Cosmetics Act, 1940 and Cosmetic Rules, 2020[9] made there under. The term cosmetics is defined under Section 3(aaa) of the Act as "*cosmetics means any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or otherwise applied to, the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance, and includes any article intended for use as a component of cosmetic.*"[10]

Above definition reflects that whether a product is a cosmetic or not depends on few parameters like the nature of the product, site of application, that is the product has to be intended to be placed in contact with external parts of the body and lastly the purpose of the product has to be exclusively to clean, beautify, change appearance and perfume. While the definition of cosmetics covers a broad spectrum, current regulations provide listing of products with codes for industry purpose. Like baby products, eye preparations, hair products. Given the current market situation, when the market is flooded with a diverse range of cosmetics there is a need of a comprehensive categorization that considers the nature of ingredients or advancements in cosmetic technology.

In 2020, Michigan State University's Centre for Research on Ingredients Safety[11] conducted a study proposing a categorization of cosmetics based on ingredients like Conventional cosmetics, Natural cosmetics, Organic Cosmetics. This categorisation is merely based on ingredients. Each country follows its categorisation based on the Bureau of Standards. Like in India, as per the Drugs and Cosmetics Act and the Bureau of Indian Standards, cosmetic skin care products are classified into Hair care products, Body care products, Make-up products, Sun and self-tanning products and Perfumes [12]

For a nuanced understanding of cosmetic products, there is a need for standard categorisation that aims to bring clarity to the market. From the perspective of international trade, categorisation proves essential for both regulatory purposes and consumer awareness, aligning with the dynamic nature of the cosmetics industry. Then there are modern cosmetics categories added to the list of cosmetics, like Cosmeceuticals[13] and nutraceuticals.[14] The term *cosmeceutical* was introduced in 1984 by Professor Albert M Kligman. Cosmeceutical represented "*a topical preparation that is sold as a cosmetic but has performance characteristics that suggest pharmaceutical action*."[15] This means a cosmetic product that is professed to have therapeutic properties. For instance, anti-ageing cream is a cosmetic product that has therapeutic claims to control wrinkles. The term Nutraceuticals was coined by Stephen DeFelice[16] from the terms nutrition and pharmaceuticals. Nutraceuticals is defined as "*a food (or part of a food) that provides medical or health benefits, including the prevention and/or treatment of a disease*."[17] This term is used for marketing and has no regulatory definition.[18] Basically, pharmaceutical forms containing food phytochemicals as active principles can be categorised as nutraceuticals.[19] Nutraceuticals are used for better skin, hair and resolving problems surrounding skin, hair, etc. It means that cosmeceuticals and nutraceuticals are products which are cosmetics per se but have therapeutic properties to solve problems. As per the definition of cosmetics, whether a product is a cosmetic or a drug under the law is determined by a product's intended use. Different laws and regulations apply to each type of product. Many times companies do not adhere to the regulation by marketing a cosmetic with a drug claim or by marketing a drug as if it were a cosmetic, without following to requirements for drugs.[20] For instance in USA the Food Drug & Cosmetics Act does not define the term "cosmeceuticals" and "nutraceuticals" nor it create

any separate categorisation for cosmeceuticals. No pre-approval is required before cosmetic products and ingredients go to the market, except colour additives under the Food, Drugs and Cosmetics Act.[21] Whereas a Drug must receive pre-market approval from the US Food and Drug Administration through its process for a new drug application or over-the-counter drug review.[22] Several rules are applicable for OTC drug[23] categories of non-prescription drug, such as what ingredients may be used and for intended use. Few well-known cosmetic products are part of non-prescription drug categories, which are sold as OTC - acne medications[24], treatments for dandruff, seborrheic dermatitis, and psoriasis[25] and sunscreens.[26] In the European Union, the term cosmeceuticals and nutraceuticals are not defined under law. Whether it will be a cosmetics or medicinal products, it depends on the function and claims of the products. If it is a cosmetic product it is regulated under (EC) No 1223/2009[27] and if it is a product that makes therapeutic claims, then it is classified as medicinal product under Directive 2001/83/EC.[28] In India there is no separate categorisation for cosmeceuticals and nutraceuticals. The terms are not defined under law. However, the cosmetic is categorised as cosmetic[29] or drugs[30] based on the intended use. The cosmeceutical and nutraceuticals products in India often fall into a murky area, where products can be marketed as cosmetics but with functional or therapeutic benefits. Increasingly, ingredients like retinoid, peptides, and antioxidants, which have pharmacological activity, are used in these products.

Cosmetic companies are no longer limited just to functional cosmetics, but now leverage cutting-edge technologies like artificial intelligence (AI) for virtual try-on experiences, allowing consumers to visualize cosmetic products before purchase. In tandem with AI, brands are pushing forward sustainable innovations to transition toward a circular economy, aiming to minimize the environmental impact of their products. This shift from conventional to modern cosmetics has not only raised industry standards but also sparked critical questions surrounding the protection and development of innovations in this fast-evolving and demanding field.

These advancements pose a fundamental question: what are the most effective ways to safeguard inventions in the beauty industry? As cosmetics become integral to daily routines, the significance of intellectual property (IP) in preserving the inventiveness behind these products becomes vital. Each facet, from revolutionary formulations to captivating packaging designs, contributes to the vibrant tapestry of the cosmetic sector, emphasizing the imperative need for robust protection. Cosmetic multinationals spend an extensive amount of money on research, development and formulation of new products to meet the diverse skin care and makeup needs of consumers. For all the developments, there are a constant effort to protect innovation through IP rights. As per Trade Related Intellectual Property Rights agreement (TRIPS) the areas of IP that it covers are: copyright and related rights; trademarks including service marks; geographical indications including appellations of origin; industrial designs; patents including the protection of new varieties of plants; the layout-designs of integrated circuits; and undisclosed information including trade secrets and test data. Intellectual Property Law plays a crucial role here, with trademarks, for instance, by protecting the identity of the brand and helping consumers to distinguish one product from other products. Recently, there has been a growing call within legal scholarship to extend copyright protections to fragrances, as modern scientific techniques have made it easier to reverse-engineer scents. However, current IP laws do not yet permit the protection of fragrances.[31]

Moreover, the surge in innovation within cosmetics, especially in areas such as skincare, haircare, cosmeceuticals, and herbal products, has made patents increasingly vital for the protection of new formulations and scientific advancements. Many cosmetic companies now maintain robust patent portfolios to shield their technological developments. To gauge the impact of innovation in the cosmetics industry, it is essential to understand the role patents play. The objective of the article is to analyze patenting trends within the cosmetics industry, specifically examining key players' patent investment strategies and identifying technological domains ripe for innovation.

To explore these questions, this article conducts an extensive patenting study to analyze trends and patterns in the cosmetic industry's innovation landscape. The first section focuses on the trends in modern cosmetic patenting, highlighting key players that are shaping the future of beauty through technological advancements. It further examines the

critical technological areas driving these innovations, such as organic fine chemistry, food chemistry.

To shed light on traditional yet emerging sectors, the subsequent section delves into patenting trends in herbal cosmetics and cosmeceuticals. Herbal cosmetics gained drive due to consumer increasing consciousness towards more sustainable, organic and health-centric beauty products. By analyzing these patent portfolios, this study aims to uncover how scientific advancements and patent strategies are influencing both mainstream and niche areas within the cosmetic industry, offering insights into the broader implications for patents in beauty innovations.

This comprehensive approach enables a clearer understanding of the evolving dynamics in cosmetic innovation and patents, offering valuable insights into the industry's future trajectory.

Methodology

With furtherance to the objective of the article to understand role of patents in the beauty industry, a patenting study has been conducted. The patenting study was carried out using Questel orbit software.[32] In this study to comprehend patenting trends, data for last twenty years have been taken (2003 to 2023) providing a deeper understanding into innovation patterns and technological The method used for the study is classification code search and key word search.[33] The classification code A61Q of IPC (International Patent Classification Code)[34] is the relevant class for cosmetics. It deals with the specific use of cosmetics and similar toilet preparations. The classification code A61P and A61Q under the Cooperative Patent Code are relevant to understanding the evolution of patents.[35] A61P of CPC deals with specific therapeutic activity of chemical compounds or medicinal preparations, and A61Q deals with specific use of cosmetics or similar toiletry preparations. Cosmetics or similar toiletry preparations should be further classified in subclass A61K 8/00, i.e. definition of chemical ingredients and physical form of the preparations which is defined as the core of the invention. Compositions which can be used in a therapeutic treatment should be further classified in A61P and also in A61K 31/00-A61K 51/00 if they are defined by their ingredients or in A61K 9/00 if they are defined by their physical form. Use of a composition as food or dietary supplement is further classified in A23L, which are known as nutracueticals.[36]

Patenting Trends in the Cosmetic Industry

Although all areas of intellectual property law facilitate and protects innovation through its own way. In this article, the aim is to understand the role of patents with regards to innovation in the cosmetic industry. Article 27.1 of TRIPS Agreement defines "*Patents as available for any inventions, whether products or processes, in all fields of technology without discrimination, subject to the normal tests of novelty, inventiveness and industrial applicability*." [37] The U.S. Patent Act, specifically 35 U.S. Code § 101, defines what is patentable. It states that- "*Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."*[38] In European Union ,EU Regulation No 1257/2012[39] creates a "European patent with unitary effect", commonly referred to as 'Unitary Patent'. The criteria of patenting are defined under Article 52 of European Patents Convention (EPC) which states that European patents shall be granted for any inventions, in all fields of technology, provided that they are new, involve an inventive step and are susceptible of industrial application .In India Patents Act, 1970 defines patentable invention under Section 2(1)(j) which states- *Invention means a new product or process involving an inventive step and capable of industrial application*.[40] For cosmetics products fulfilling the patenting criteria of novelty and non-obviousness can be challenging. Given the competitive nature of the cosmetics market, formulating something entirely new is tough. In addition to the criteria for patentability under the Indian Patents Act, there are explicit exceptions outlined in Section 3 that specify what cannot be patented. For instance, Section 3(j)[41] excludes inventions that are consisting of plants and animals in whole or any part thereof, and Section 3(p)[42] excludes invention which in effect is traditional knowledge. Due to these exceptions, it can be difficult for organic or natural cosmetics to qualify for patents, as many formulations may fall under these exclusions or fail to meet the stringent requirements.

Moreover, there are other issues concerning the patenting of cosmetic products. For instance, one of the main issues is the fast-changing trends in the beauty industry. The patent process, which generally take up to 24 months to 36 months or more in almost all jurisdictions, means that by the time a patent is

granted, the product or its underlying trend may no longer be in demand.

However, despite these challenges, cosmetic companies frequently engage in nuanced patenting practices. They may secure patents by introducing novel ingredients or formulations, which help them meet the criteria for invention. Excitingly, patents are also granted for packaging designs, as certain companies in the beauty industry develop innovative ways of packaging that contribute to the distinctiveness of their products.[43] This creative approach helps them maintain their competitive edge in a rapidly evolving industry. From the cosmetic products standpoint a product can be wildly popular but can be non-patentable. Despite the high standards set out in the legislation, there are constant demand of increasing beauty standards. The evolving technology like AI, biotechnology, nanotechnology has fuelled the genesis of new inventions of beauty products. Conglomerates are looking for ways to develop patent system and to protect the formulation, research, and development of beauty products. Hence a study is conducted to understand the role of patents in the cosmetic industry.

A search under A61Q reflects that in the last twenty there are 45,757 total patents. Out of which 24,922 are alive and remaining 20835 are dead. The below figures serve as an indicator for the patent portfolios among the key players in the cosmetics industry. The applicant's patent portfolio can be estimated using this information. The top applicants of patents by volume in the global cosmetics industry are shown in this Fig. 1. Fig. 1 (a) indicates the applicants who have the maximum number of patents

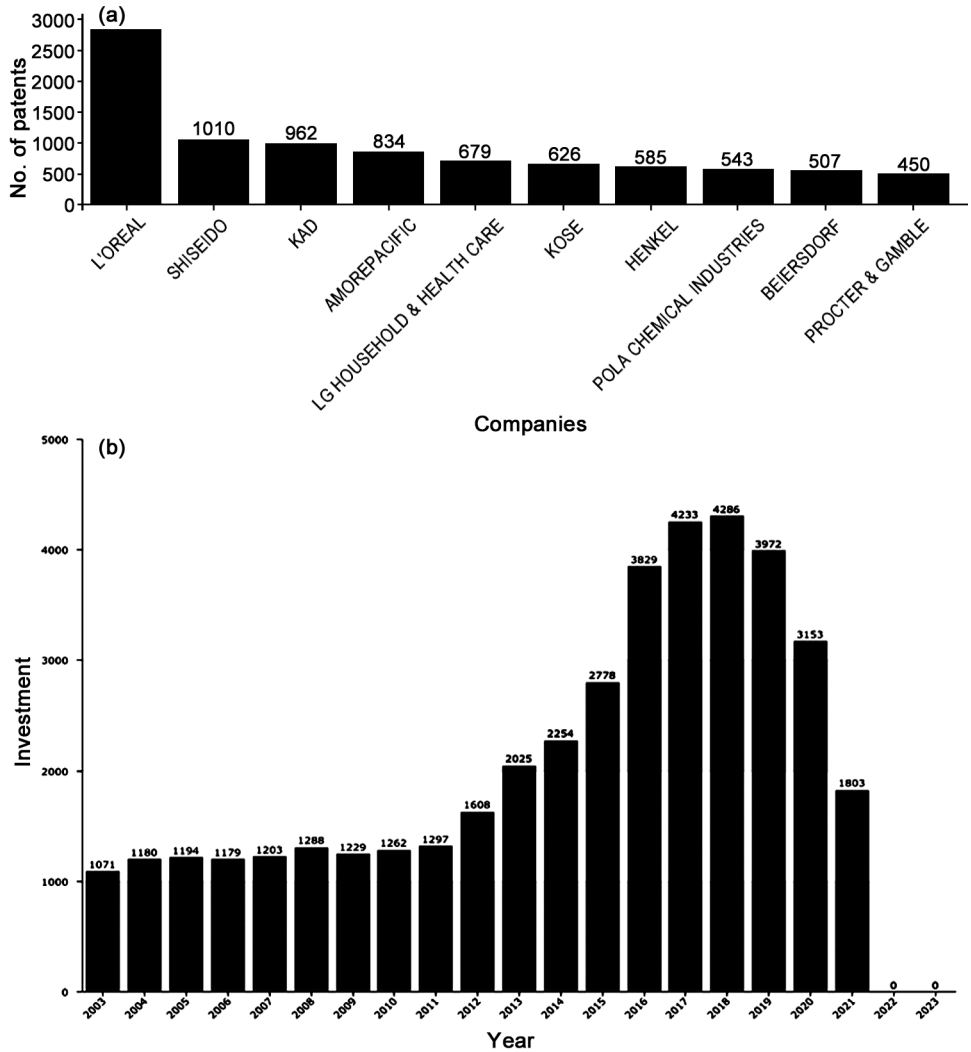

Fig. 1 — (a) Patent portfolio of top companies, and (b) Investment trend in the cosmetic industry

and Fig. 1 (b) indicates investment trend in the cosmetic sector.

The above figures show top companies in the field of cosmetics are L'Oréal, Kao and Shiseido. L'Oréal a global cosmetic company originating from France has the largest patent portfolio of 1165 patents, followed by Kao and Shiseido from Japan. The study reflects an interesting note that top company's revenues wise in the beauty industry are the ones holding maximum patents around the world. The other figure showcases investment trend of patent of the last twenty years, which shows an upward trend of patenting activity. These figures show how cosmetic industry is driven by patents. To drive business growth, it is not necessary to obtain large number of patents. But what is important is to have an intellectual property strategy to manage your patents commercially.[44] Like in the hair care sector some companies have multiple patents and while some lead the business with one patent. For example, Companies like L'oreal, Sabinsa are top players in the cosmetic sector and their hair care products are rated topmost. They have many patents in the hair care field under their portfolio. While haircare company Olaplex's business revolves around just one patent on bis-aminopropyl diglycol dimaleate (US Pat No. 9,095,518),[45] a scientific method for fixing hair and skin. The consumers of today's generation are science-conscious shopper; a patented ingredient or formula can serve to elevate the value of the brand to the consumer. The responsibility is on the brand to protect and interconnect effectively the benefits and uniqueness of emerging trends and patent activity in cosmetics. On the other side there are many shortcomings of patenting, it is not always a best option because of short shelf life of cosmetic products, high cost of patenting, changing demand of consumers. Unless you are a large multinational company, patenting can be expensive, especially proprietary cosmetics houses many a times opt protection by way of trade secrets.

However, cosmetic multinationals spend an extensive amount of money on research, development and formulation of new products to meet the diverse skin care and makeup needs of consumers. A research made in 2009 in the European Union revealed that, 10% of the granted patent is held by the cosmetic industry.[46] Also, WIPO Statistics Database shows cosmetics within top 10 ranks in terms of Distribution of non-resident trademark applications by top NICE classes, 2022.[47]

Figure 1 (a-b) offer insights into the patent portfolios of leading companies in various industries. In order to comprehend the patenting trends specifically within the beauty industry, further study is being conducted on the technical domains where patenting activity is currently taking place. The study highlights the primary technological domains within the cosmetic sector.

Figure 2 (a) demonstrates key players by technical domain and Fig. 2 (b) showcase various technological application in the cosmetic industry.

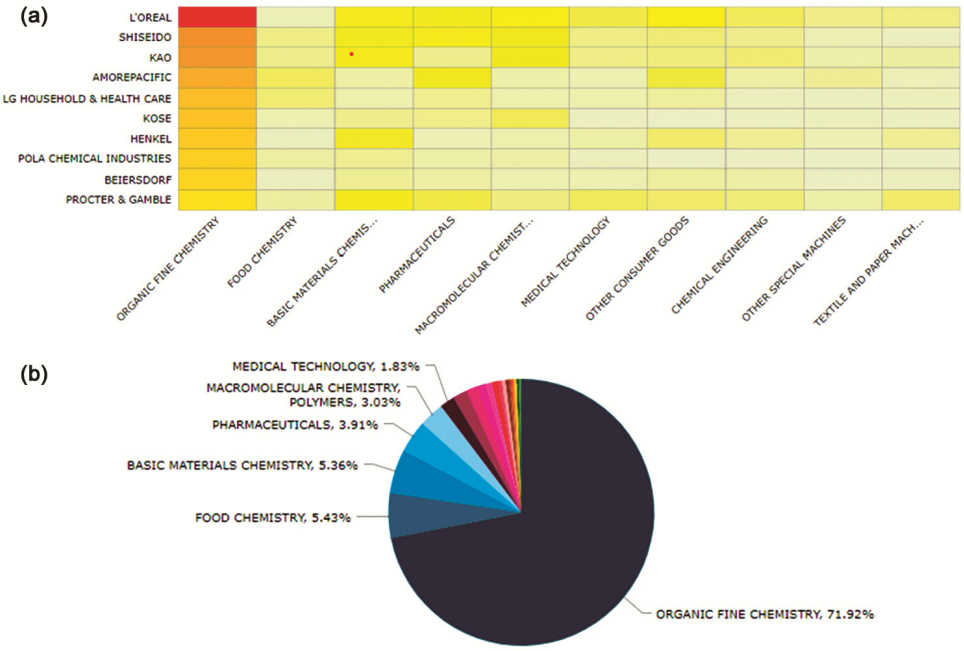

Fig. 2 — (a) Key players by technical domain, and (b) Technology overview in the cosmetic industry

Figure 2 indicates relevant innovative technological field in the cosmetic sector. The data indicates that major global players such as L'Oréal, Kao, and Shiseido are actively engaging in patenting within advanced technological domains, aiming to sustain a competitive advantage and reap market benefits the most popular concepts in the research field are shown in this figure. This may serve as inspiration for novel ideas or the discovery of proprietary technology in uncharted territory. The fields of organic fine chemistry, food chemistry, pharmaceuticals, and biotechnology are top technological domain in the cosmetic sector. Pharmaceuticals is a significant area in the domain of cosmetics. Pharmaceutical products are approved by the regulatory body and are scientifically proven and claimed. Whereas there is a new category of cosmetic grade products which is a hybrid of both pharmaceuticals and cosmetics known as "Cosmeceuticals". The term "cosmeceutical" was coined by Dr. Albert Kligman[48] to describe a new category of cosmetics that bridge the gap between drugs and cosmetics. Cosmeceuticals offer pharmaceutical therapeutic benefits within cosmetic products.

The prevalent trends in top technology fields also highlight the surging popularity and demand for organic and natural cosmetics. Organic cosmetics, characterized by the utilization of naturally derived substances, such as herbal extracts, as opposed to synthetic chemicals, are gaining widespread consumer preference. In this context, a detailed exploration of the intricacies surrounding the patenting of herbal cosmetics becomes paramount.

Patenting in Herbal Cosmetics

Traditionally cosmetics were mainly derived from natural, herbal ingredients often prepared at home using plant based remedies. Slowly there was a transition from herbal, natural cosmetics to chemical based cosmetics offering from variety and longer shelf life. In the recent years there has been a revival of the natural, organic cosmetics as today's consumers are more aware and conscious about their product choices. They now seek transparency in the products as well information about environmental and other health impact of their beauty products. The news about the negative effects of conventional cosmetics consisting of dangerous prohibited ingredients like lead, a highly toxic metal created fear in the minds of consumers.[49] The lead content in the tested samples varied depending on the additives used along with the method of production. Reports on harmful effects of famous beauty products like liquid keratin hair treatment case,[50] Johnson & Johnson talc law suit,[51] Hawaii Sunscreen case[52-53], and risks associated with edible beauty have created concerns.[54] Further, the news of the presence of carcinogens and human endocrine system disrupting ingredients[55] and the lack of effective regulation of cosmetic products revitalised the demand for herbal-based cosmetics. The demand for synthetic conventional cosmetics has recently changed in favour of green, clean, and herbal cosmetics in the beauty and personal care sector.[56] Most of the largest cosmetic companies in the world have launched their brands on herbal care during the past few years. Numerous SMEs and regional business owners have also introduced herbal cosmetic brands. Other factors associated with the growth of herbal cosmetics are consumer interest in natural products with proven age-old proven efficacy and economic benefit associated with traditional knowledge.

The likable aspects of herbal cosmetics are –age-old proven usage, safety to use because of long history of usage, mild in nature compared to synthetic cosmetic, easy hydration in skin, and environmentally sustainable. Due to these aspects, there is a growing development of research around herbal cosmetic. To protect these developments around herbal cosmetics, the pertinent question is whether cosmetics products/ formulation manufactured with herbal ingredients is can it be patented.[57] The market of natural and organic cosmetics is highly competitive, making intellectual property right mainly patents an important tool in safeguarding market position Typically, a naturally occurring product in its natural state cannot be patented. However, if the invention meets the patentability criteria as per Article 27 of TRIPS [58]which mandates patents to be made available for inventions, whether products or processes, in all fields of technology, provided said inventions are new, inventive and capable of industrial application, then herbal patent can be obtained. The criteria of patentability are mainly threefold- firstly novelty, secondly non obviousness and thirdly usefulness. The criteria slightly vary across different jurisdictions but overall they remain same. Apart from these criteria also patenting of natural and organic cosmetics can pose significant challenges. For instance in USA, the line between patentable and non-patentable subject matter is established by 35 U.S.C. § 101 and elucidated by judicial interpretations of the statutory provision in the

case of *Diamond* v *Diehr,*[59] *Parke-Davis & Co.* v *H.K. Mulford Co*.[60] Courts have declared the expansive language of § 101, declaring abstract ideas, laws of nature— products of nature non-patentable exclusions from otherwise patentable subject matter.[61] Historically, however, the judiciary had developed a significant exception to the natural product exclusion: that the composition of matter of a natural product, isolated and purified from nature, is eligible for patent protection.[62] Similarly, according to Rule 27(a)[63] of the European Patent Convention, biotechnological inventions may be patentable if they concern "*biological material which is isolated from its natural environment or produced by means of a technical process even if it previously occurred in nature.*"[64] In India patents relating to natural cosmetics do not qualify as an invention under Section 2 (1) (j) of the Patents Act, 1970, which defines that "invention means a new product or process involving an inventive step and capable of industrial application". Further, under Section 3(e) of the Patents Act "*a substance obtained by a mere admixture resulting only in the aggregation of the properties of the components thereof or process for producing such substances*" is not an invention and hence, not patentable. The Indian Patents Act also has a unique provision under Section 3 (p), wherein "*an invention which, in effect, is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components*" is not an invention and hence, not patentable, within the meaning of the Patents Act. Furthermore, other provisions like Section 3 (b-f)[65-68], (i-j)[69-70] are of significance with respect to the patent applications related to traditional knowledge (TK) and/or biological material in the cosmetic industry. Since most of the natural cosmetics contain either traditional knowledge or biological material, it falls under the above provisions of the Patents Act, 1970.Additionally under Section 6 (1) of the Biological Diversity Act, 2002 states clearly that "*no person shall apply for any intellectual property right, by whatever name called, in or outside India for any invention based on any research or information on a biological resource obtained from India without obtaining the previous approval of National Biodiversity Authority before making such application; provided that, if a person applies for a patent, permission of the National Biodiversity Authority may be obtained after the acceptance of the patent but before the sealing of the patent by the patent authority concerned; provided further that the National Biodiversity Authority shall dispose of the application for permission made to it within a period of ninety days from the date of receipt thereof.*" The Indian Patent Law complements this section of the Biological Diversity Act, 2002 by making it mandatory for the applicant of a patent to submit a declaration under Form-1 (Application for Grant of Patent) of the Patent Rules 2003 to the effect that "*the invention as disclosed in the specification uses the biological material from India and the necessary permission from the Competent Authority shall be submitted by me/us before the grant of patent to me/us."* The Biological Diversity Act, 2002 has a punitive provision in this regard under Section 55 (1) which provides that "*whoever contravenes or attempts to contravene or abets the contravention of the provisions of the Section 3*[71] *or Section 4*[72] *or Section 6*[73] *shall be punishable with imprisonment for a term which may extend to five years, or with fine which may extend to ten lakh rupees and where the damage caused exceeds ten lakh rupees such fine may commensurate with the damage caused, or with both."*

Additionally, the Convention on Biological Diversity (CBD)[74] is also applicable, which emphasizes on conservation, sustainable use and fair and equitable benefit sharing of genetic resources.[75] Post CBD, Intellectual Property rights arising out of access to genetic resources or Traditional knowledge are possible only when the benefits are shared with the country/local community providing it.

It is noteworthy that the Geneva-based Union for Ethical Bio Trade[76] describes how the relevance of patent protection for cosmetics has increased over the past 20 years, according to an analysis of global patent activity conducted in 2010. A Thomson Innovation web platform patent search revealed that up to 60,000 cases of patents for cosmetics, toiletries, plant extracts, components, and natural bioactive were published in the last 20 years.[77] Patents based on herbal extracts are also on the rise. With the growth of the green beauty and clean beauty segment, consumers are increasingly showing a yearning to use products with minimal damage to the environment.[78] This has led to an increase in the filing of patents in the area of green and clean beauty. A secondary search analysis has been conducted on the growing patenting trend in the domain of herbal cosmetics. The search analysis under the classification code A61 Q and A61k 36/00 of IPC for the last twenty years (2003-2023) gives an overview of major players and technological domains, which is indicated in Fig. 3 (a-b).

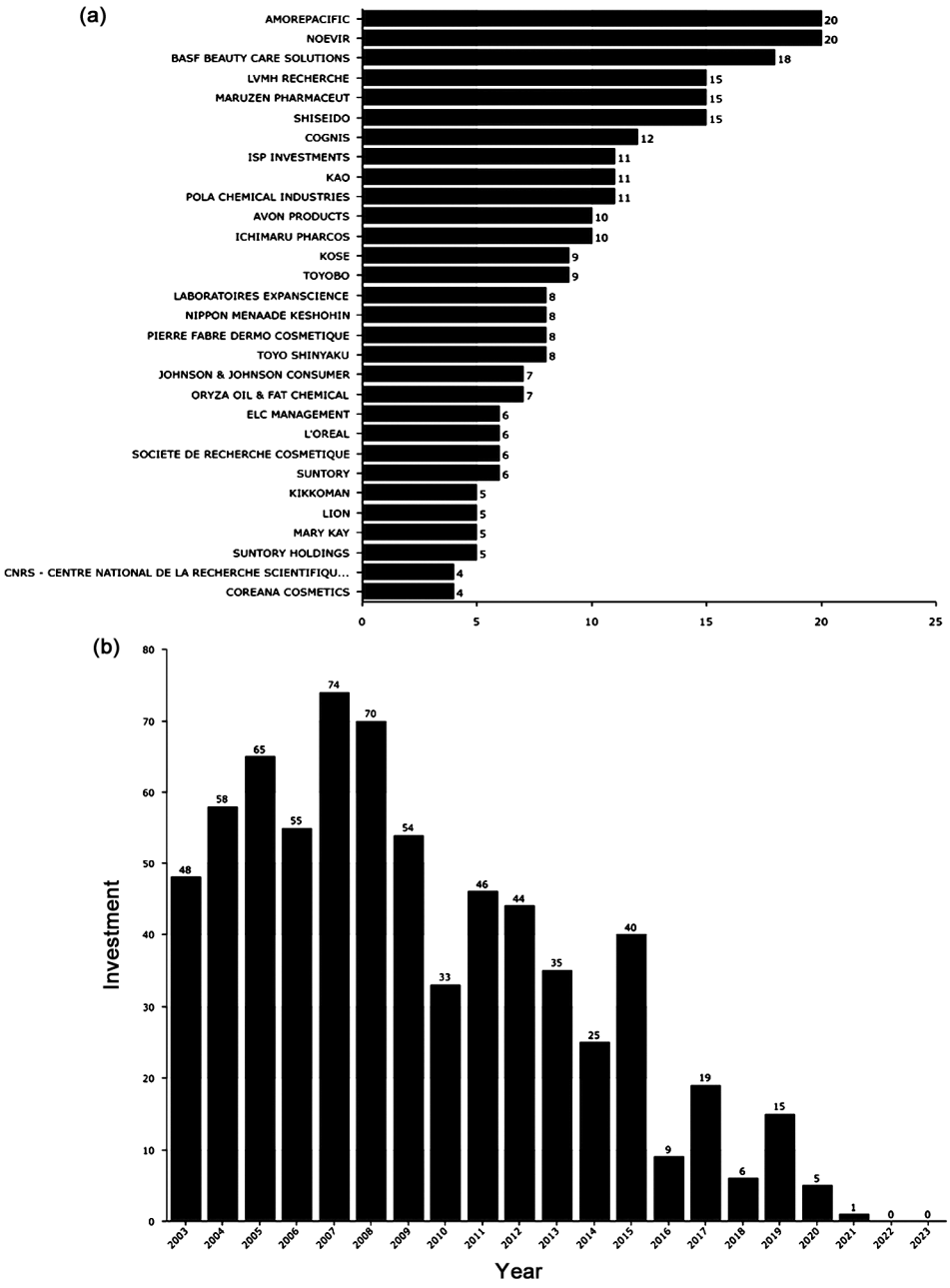

Fig. 3— (a) Patenting trends in herbal cosmetics, and (b) Investment trends in herbal cosmetics

There are abundant herbal ingredients available naturally, having different uses in cosmetic preparations for skincare, hair care and as antioxidants, fragrant. Owing to the increasing demand of herbal products, cosmetic companies are engaging in development of herbal cosmetics. In the herbal cosmetic market also L'Oréal, Kao, and Shiseido, three major players in the beauty industry, all have robust patent portfolios. Followed by Pola Chemical Industries and Avon Products. Figures 3 and 4, which depicts substantial and ongoing patenting activity in this field, reflects the high market demand for herbal cosmetics and cosmeceuticals.

Figure 4 (a) describes key technologies in herbal cosmetics and 4b deals with application in the field of herbal cosmetics. Patenting operations have been sparked by a resurgence of interest in traditional herbal compounds. The figure reflects that patenting activity revolves primarily in skin related products, Aging products, lipstick, then UV absorber, Skin

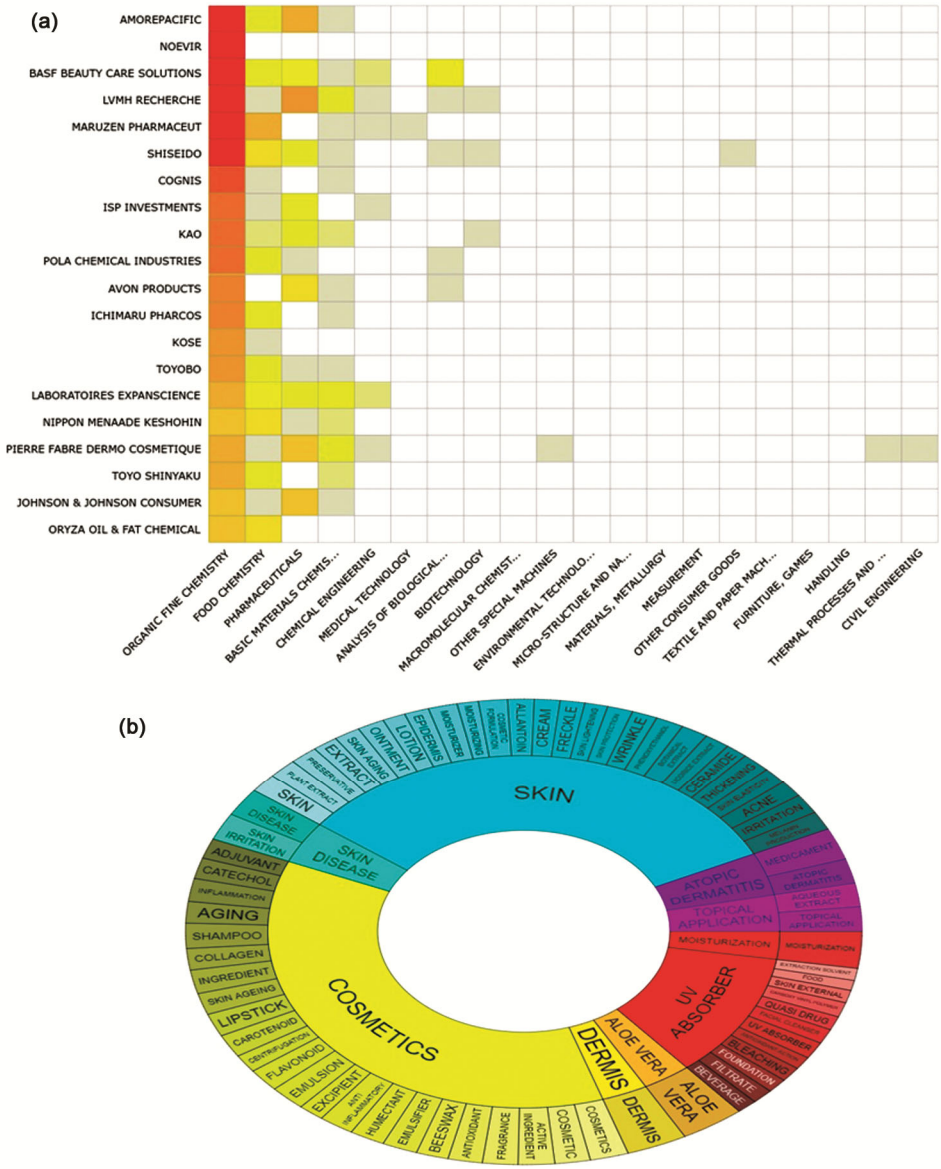

Fig. 4 — (a) Key players by technical domains in herbal cosmetics, and (b) Technologies and domains in herbal cosmetics

disease, moisturisation, Topical application amongst others. One common natural component like *Aloe vera* as shown in Fig. 4(b) has 102 patents. Like *Aloe vera* there are several herbal components which have seen a modest uptick in patent activity. Along with the resurgence of the herbal cosmetics business, modern mega technologies have created new opportunities for inventions and developments in the cosmetics industry.

Studying patent portfolios gives an idea of the development in the market. It provides information on the patent strategies of the companies in the sector. Additionally, the publishing of patents encourages future research and development, making patents a valuable source of information. Both customers and inventors gain from this encouragement of innovation and enhanced knowledge. Based on the growth of patenting activity in the cosmetic sector, it gives the` impression that research and development play an important role in the cosmetic market.[79]

Patent analysis reveals an increase number of applications involving cosmetic containing plants components, with a higher number of deposits related to anti-ageing and whitening.[80] Though patent system is widely renowned for safeguarding intellectual property globally. However, the TRIPS Agreement under Article 27.3(b) introduces different patent approach, for areas dealing with biological materials and living

organisms.[81] This has sparked debates due to its legal and ethical considerations. Different countries, with diverse development and industrialization levels, hold varying opinions on this matter, resulting in conflicting interests during its implementation and patenting of herbal products. But the expansion of Research and Development indicated development of cosmeceuticals based on herbal formulation which has laid bare the impactful role of technology in steering the cosmetics sector.[82] The surge in the number of patents incorporating herbal components marks a pivotal moment, indicating the profound transformation underway in the market. This technological infusion through expansion of Research and Development is not merely a trend; it's a seismic shift in how the cosmetic industry approaches innovation. These bio-active ingredients are showcasing a convergence of beauty and health, challenging conventional distinctions and opening new avenues for product development. The cosmetic sector is evolving into a dynamic space where science and beauty are seamlessly integrated, propelled by innovations that bridge the gap between traditional cosmetic applications and therapeutic functionalities.

Conclusion

The findings of the patenting study to unveil the role of patents in the cosmetic industry underscore the significant investment in patents within the cosmetics industry. The top companies having maximum number of patents includes L'Oréal, Shiseido, Kao and Amor pacific. Patenting in cosmetics is not limited to any particular domain but in different technological domains including pharmaceuticals, biotechnology, organic chemistry. Patenting in the area of pharmaceuticals which includes cosmeceuticals and nutraceuticals are important development. The regulatory landscape for cosmetics is increasingly complex due to innovations that blur the lines between cosmetics and pharmaceuticals. This complexity is not adequately addressed by the existing regulations. The patenting study underscores substantial patenting in the area of natural and organic cosmetics as well. Patenting in *Aloevera* occupies a significant area in the patenting of herbal cosmetics. In the realm of herbal cosmetics, patents also encompass a variety of technologies, including those related to environmental and medical advancements.

In conclusion this patenting study brings to a pertinent question: whether innovations related to cosmetics are increasing because of beauty standards or *vice versa*? The relationship between innovations in cosmetics and evolving beauty standards is multifaceted and reciprocal. On the one hand, advancements in cosmetic technology, such as new formulations, application techniques, and personalized products, often set new benchmarks for beauty and create opportunities for redefining standards. These innovations can lead to the emergence of new beauty trends, influencing public perception and expectations.

Conversely, varying beauty standards drive the demand for innovative cosmetic products as well. With the shift in societal ideals and preferences, consumers seek products that match with or enhance these evolving standards. For instance, the rising importance of inclusivity and diversity has urged the development of a wider range of shades and formulations to cater to a broader range of skin tones and types. Herbal cosmetics have gained relevance in the beauty industry as consumers increasingly seek natural, eco-friendly substitutes. This growing demand has led major cosmetic companies to dedicate entire product lines or sections to natural and herbal cosmetics, underscoring the prominence of these products in their websites. Patents have become a crucial tool for brands to secure the competitive edge in this evolving market. By protecting innovations in herbal formulations, brands can retain their market share and safeguard their unique product offerings against competitors. As a result, patent portfolios now play a strategic role in maintaining the credibility and success of companies in the natural cosmetics space.

Overall, the interplay between cosmetic innovation and beauty standards is dynamic and ongoing. Each influences and reshapes the other, contributing to the continuous evolution of both the industry and societal perceptions of beauty. In this continuous space for innovation, intellectual property is not merely a crucial component from a research and development standpoint; it is also a cornerstone for formulating a robust corporate strategy. The patent trends presented in the paper indicate that the cosmetic sector holds significant importance in terms of patent registrations, and there exists a notable concentration of registration activities among the industry's major players. The leading companies in the cosmetic sector boast substantial patent portfolios. The study underscores a prevalence of proprietary applications, albeit at levels that could be considered relatively modest. This is because, in developing countries, the cosmetic industry often relies on proprietary formulations, with businesses choosing to

safeguard them as trade secrets instead of patenting them. In essence, intellectual property law emerges as a significant driver in the evolution of modern cosmetics. However, to propel the sector further, there is a pressing need for more diversification and the inclusion of additional players in the industry.

References

1 Patkar K B, Herbal cosmetics in ancient India, *Indian Journal of Plastic Surgery*, 41 (2008)S 134.

2 Yuquan L, Sun J & Zhu L, Ethnic elements in Chinese cosmetic brands: An exploration of digital communication effects on the recognition of Chinese national identity, *Telematics and Informatics Reports,* 10 (2023) 100046.

3 Levine, E.S. and Green, W., The cosmetic mystique of old Japan. *Impressions*, 4 (1980).

4 Mcmullen RL & Dellacqua G, History of natural ingredients in cosmetics, *Cosmetics*, 10 (2023).

5 https://www.statista.com/outlook/cmo/beauty-personal-care/worldwide (accessed on 22 September 2024).

6 https://www.precedenceresearch.com/herbal-beauty-products-market (accessed on 12 April 2024).

7 https://www.govinfo.gov/content/pkg/COMPS-973/pdf//COMPS-973.pdf (accessed on 12 April 2024).

8 https://health.ec.europa.eu/system/files/2016-11/cosmetic_1223_2009_regulation_en_0.pdf (accessed on 22 September 2024).

9 https://cdsco.gov.in/opencms/opencms/system/modules/CDSCO.WEB/elements/download_file_division.jsp?num_id=OTIyNg= (accessed on 22 September 2024).

10 http://www.indiacode.nic.in/bitstream/123456789/152781/drug_cosmeticsa1940-23.pdf

11 https://www.canr.msu.edu/news/cosmetics-natural-organic-conventional (accessed on 12 April 2024).

12 https://www.services.bis.gov.in/php/BIS_2.0/bisconnect/get_is_list_by_category_id/11#:~:text=8.&text=37.&text=This%20International%20Standard%20establishes%20the,the%20water%20resistance%20of%20watches.&text=Note%202%20:%20For%20complete%20list,www.manakonline.in) (accessed on16 September 2024).

13 Choi C M & Berson D S, Cosmeceuticals: In seminars in cutaneous medicine and surgery, *Elsevier,* 25 (3) (2006) 163.

14 Souyoul S A, Saussy, K P & Lupo MP, Nutraceuticals: A review, *Dermatology and Therapy,* (8)(2018) 5.

15 Pandey A, Jatana G K & Sonthalia S, *Cosmeceuticals,* 2025.

16 https://www.foodprocessingindia.gov.in/newsletter/emailer/two (accessed on 22 September 2024).

17 Brower V, Nutraceuticals: Poised for a healthy slice of the healthcare market? *Nature Biotechnology*, 16 (1998) 728.

18 Steven H Z,Regulation of nutraceuticals, *Science,* 285 (5435) (1999) 1853.

19 Carlos E J, García-Conesa M T & Tomás-Barberán F A, Nutraceuticals: Facts and fiction, *Phytochemistry,* 68 (22-24) (2007) 2986.

20 https://www.fda.gov/cosmetics/cosmetics-laws-regulations/it-cosmetic-drug-or-both-or-it-soap (accessed on 22 September 2024).

21 U.S. Code § 379e-Listing and certification of color additives for foods, drugs, devices and cosmetics. (accessed on 13 December, 2024)

22 https://www.law.cornell.edu/uscode/text/21/379e (accessed on 13 December 2024).

23 Title 21, Chapter I, Sub-chapter D, Part314, Applications for FDA approval to market a new drug, https://www.fda.gov/cosmetics/cosmetics-laws-regulations/it-cosmetic-drug-or-both-or-it-soap (accessed on 13 December 2024).

24 Title21, Chapter 1, Sub-chapter-D, Part 333, https://www.ecfr.gov/current/title-21/chapter-I/subchapter-D/part-333 (accessed on 13 December 2024).

25 Title 21, Chapter 1, Sub-Chapter D, Part 358, https://www.ecfr.gov/current/title-21/chapter-I/subchapter-D/part-358 (accessed on 13 December 2024).

26 Title 21, Chapter 1, Sub-Chapter D, Part 352, https://www.ecfr.gov/current/title-21/chapter-I/subchapter-D/part-352 (accessed on 13 December 2024).

27 Regulation (EC) No1223/2009,https://health.ec.europa.eu/system/files/201611/cosmetic_1223_2009_regulation_en_0.pdf(accessed on 22 September 2024).

28 Directive 2001/83/EC, https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:311:0067:0128:en:PDF (accessed on 22 September 2024).

29 Section 3(aaa) of the Drugs and Cosmetics Act, 1940, https://www.indiacode.nic.in/bitstream/123456789/15278/1/drug_cosmeticsa1940-23.pdf (accessed on12 April2024).

30 Section 3(b)(i) of the Drugs and Cosmetics Act, 1940, https://www.indiacode.nic.in/bitstream/123456789/15278/1/drug_cosmeticsa1940-23.pdf (accessed on 12 April 2024).

31 Clay M M, Copycat cosmetics: The beauty industry and the bounds of the American Intellectual Property System, *Minnesota Law Review*, 106(2021)425.

32 https://www.orbit.com (accessed on12 April 2024).

33 Verma M& Varma V, Exploring Keyphrase Extraction and IPC Classification Vectors for Prior Art Search, *CLEF (Notebook Papers/Labs/Workshop)*, 2011.

34 https://ipcpub.wipo.int/ (accessed on12April 2024).

35 https://www.uspto.gov/eb/patents/classification/cpc/html/cpc.html (accessed on 12 April 2024).

36 https://www.uspto.gov/web/patents/classification/cpc/html/defA23L.html (accessed on12 April 2024).

37 https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm#patents (accessed on 16 September 2024).

38 35 U.S.C. 101 Inventions Patentable, https://www.uspto.gov/web/offices/pac/mpep/s2104.html (accessed on 22 September 2024).

39 EU Regulation No 1257/2012, https://www.epo.org/en/applying/european/unitary/unitary-patent/features (accessed on 22 September 2024).

40 The Patents Act, 1970, https://ipindia.gov.in/writereaddata/Portal/ev/sections/ps2.html (accessed on 13 December 2024).

41 Section 3j-*plants and animals in whole or any part thereof other than micro-organisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals,* https://ipindia.gov.in/writereaddata/Portal/ev/sections/ps2.html (accessed on 13 December 2024).

42 Section 3p-*an invention which, in effect, is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known components or components*.https://ipindia.gov.in/writereaddata/Portal/ev/sections/ps2.html (accessed on 13 December 2024).

43 https://www.mishcon.com/news/innovation-in-the-beauty-industry-the-role-of-patents (accessed on 25 September 2024).

44 https://www.wipo.int/sme/en/checklist.html (accessed on 12 April 2024).

45 https://olaplex.com/pages/patents (accessed on 12 April 2024).

46 https://cosmeticseurope.eu/cosmetics-industry/understanding-cosmetics-regulation/ (accessed 12 April 2024).

47 WIPO Indicators, 2023 https://www.wipo.int/edocs/pubdocs/en/wipo-pub-941-2023-en-world-intellectual-property-indicators-2023.pdf, (accessed on 22 September 2024).

48 Kligman D, Cosmeceuticals, *Dermatologic Clinics*, 18(4) (2000) 609.

49 Watnick V J, The missing link: US regulation of consumer cosmetic products to protect human health and the environment, *Pace Environmental Law Review,* (31) (2014) 594.

50 http://www.ewg.org/the-toxic-twelve-chemicals-and-contaminants-in-cosmetics (accessed on 22 September 2024)

51 https://www.theguardian.com/business/2023/jul/19/johnson-johnson-cancer-patient-lawsuit(accessed on 12 April, 2024).

52 Scheuer E& Warshaw E, Sunscreen allergy: A review of epidemiology, clinical characteristics, and responsible allergens, *DERM*, 17(1) (2006) 3.

53 Levine A, Sunscreen use and awareness of chemical toxicity among beach goers in Hawaii prior to a ban on the sale of sunscreens containing ingredients found to be toxic to coral reef ecosystems, *Marine Policy*, (117) (2020) 103875.

54 https://www.thehindu.com/sci-tech/health/nutraceuticals-indian-healthcare-market-functional-medicine-improving-wellness-poor-science/article66887833.ece (accessed on 12 April 2024).

55 Ripamonti E, Allifranchini E, Todeschi S& Bocchietto E, Endocrine disruption by mixtures in topical consumer products, *Cosmetics*, 5 (41) (2018) 61.

56 Amberg N& Fogarassy C, Green consumer behaviour in the cosmetics market, *Resources*, 8 (3) (2019)137.

57 Donald S C, Patentability under TRIPS: The need for uniformity, *Indian Journal of Law & Technology,* 2 (2006) 1.

58 https://www.wto.org/english/docs_e/legal_e/27-trips_04c_e.htm (accessed on 22nd September 2024)

59 *Diamond* v *Diehr*, 450 U.S. 175, 186 (1981).

60 *Parke-Davis & Co.* V *H K Mulford Co.*, 189 F. 95, 103 (C.C.D.N.Y. 1911).

61 Tallmadge E H, Patenting natural products after myriad, *Harvard Journal of Law & Technology*, 30 (2016) 569.

62 *Association for Molecular Pathologies al.* v Myriad Genetics, Inc. *et al*., 569 U.S. 12-398 (accessed on 13 June 2024).

63 https://www.epo.org/en/legal/epc/2020/r27.html (accessed on 22 September 2024).

64 https://www.simmonssimmons.com/en/publications/ckfxuqnou6mkn0a25dlew2v44/patenting-natural-products-part-1-newly-isolated-material (accessed on 23 September 2024).

65 Section 3b of Patents Act, 1970 -*an invention the primary or intended use or commercial exploitation of which could be contrary to public order or morality or which causes serious prejudice to human, animal or plant life or health or to the environment,*https://ipindia.gov.in/writereaddata/portal/ipoac/1_31_1_patent-act-1970-11march2015.pdf (accessed on 22 September 2024).

66 Section 3c of Patents Act, 1970 -*the mere discovery of a scientific principle or the formulation of an abstract theory or discovery of any living thing or non-living substance occurring in nature,*https://ipindia.gov.in/writereaddata/portal/ipoact/1_31_1_patent-act-1970-11march2015.pdf (accessed on 22 September 2024).

67 Section 3d of Patents Act, 1970 -*the mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant,*https://ipindia.gov.in/writereaddata/portal/ipoact/1_31_1_patent-act-1970-11march2015.pdf (accessed on 22 September2024).

68 Section 3f of Patents Act, 1970 -*the mere arrangement or re-arrangement or duplication of known devices, each functioning independently of one another in a known way,*https://ipindia.gov.in/writereaddata/portal/ipoact/1_31_1_patent-act-1970-11march2015.pdf, Section 3h of Patents Act, 1970- *a method of agriculture or horticulture,*https://ipindia.gov.in/writereaddata/portal/ipoact/1_31_1_patent-act-1970-11march2015.pdf (accessed on 22 September 2024).

69 Section 3i of Patents Act, 1970 -*any process for the medicinal, surgical, curative, prophylactic diagnostic, therapeutic or other treatment of human beings or any process for a similar treatment of animals to render them free of disease or to increase their economic value or that of their products,* https://ipindia.gov.in/writereaddata/portal/ipoact/1_31_1_patent-act-1970-11march2015.pdf (accessed on 22 September 2024).

70 Section 3j of Patents Act, 1970 -*plants and animals in whole or any part thereof other than microorganisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals,* https://ipindia.gov.in/writereaddata/portal/ipoact/1_31_1_patent-act-1970-11march2015.pdf *(*accessed on 21 September 2024).

71 Section 3, The Biological Diversity Act,2002, Certain persons not to undertake Biodiversity related activities without approval of National Biodiversity Authority, https://www.indiacode.nic.in/handle/123456789/2046?sam_handle#:~:text=Section%203.,approval%20of%20National%20Biodiversity%20Authority (accessed on 12 November 2024).

72 Section 4, The Biological Diversity Act, 2002, Results of research not to be transferred to certain persons without approval of National Biodiversity Authority, https://www.indiacode.nic.in/handle/123456789/2046?sam_handle#:~:text=Section%203.,approval%20of%20National%20Biodiversity%20Authority(accessed on 12 November 2024).

73 Section 6, The Biological Diversity Act, 2002, Application for intellectual property rights not to be made without approval of National Biodiversity Authority, https://www.indiacode.nic.in/handle/123456789/2046?sam_handle#:~:text=Section%203.approval%20of%20National%20Biodiversity%20Authority (accessed on 12 November2024).

74 https://www.cbd.int/ (accessed on 12 April 2024)

75 *Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their*

Utilization, Convention on Biological Diversity, 2002, https://www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf (accessed on 12 April2024).

76 https://uebt.org/ (accessed on 12 April 2024)

77 Yapar E. A, Intellectual property and patent in cosmetics, Marmara Pharmaceutical Journal, 21(3) (2017) 419-424.

78 Dutt B, A study of patenting activity in *Aloe vera*, *Journal of Intellectual Property, Rights*, 7 (4) (2002) 330.

79 https://www.jwp-poland.com/patent-trends-in-cosmetics-industry-for-2024/(accessed on 15 December, 2024)

80 Magalhães W V, Baby A R, Velasco M V R, Pereira D M M & Kaneko T M, Patenting in the cosmetic sector: Study of the use of herbal extracts, *Brazilian Journal of Pharmaceutical Sciences*, (47) (2011) 693.

81 https://www.wto.org/english/tratop_e/trips_e/art27_3b_background_e.htm (accessed on 12 April 2024).

82 Bellad, Kishor A., *et al*. "Development of cosmeceuticals."*World. J. Pharm. Pharm. Sci* 6.4 (2017): 643-691.