

**COPYRIGHT OR TRADE DRESS?
TOWARD IP PROTECTION OF
MULTISENSORY EFFECT DESIGNS FOR
IMMERSIVE VIRTUAL ENVIRONMENTS[♦]**

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INTRODUCTION

Lola puts on a virtual reality (“VR”) head-mounted display (“HMD”) and a data glove.¹ A VR program loads onto the headset, and Lola is swiftly transported to a computer-generated, three-dimensional representation of the Martian landscape. She can directly manipulate and interact with the simulated world as if it were an immediate physical environment: when she moves her head to the right, the visual field simultaneously turns to her left, allowing Lola to take in her 360-

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¹ An HMD is a display device worn on the head that creates the illusion of three-dimensional depth in a flat image. The HMD is the primary means through which a user perceives the audiovisual space of a VR program. A data glove is an interactive device that facilitates tactile sensing and fine-motion control in a VR program. For a detailed discussion of the HMD and data glove, see *infra* Part I.B.

degree surroundings. When her data-gloved hand pokes the simulated surface, she receives haptic feedback through the glove as she watches rust-colored Martian pebbles slide over the top, reflecting a law of gravity that is clearly not of earth. Although her real, physical body is rooted in her immediate surroundings, Lola's senses convey that she is within a virtual world created by computer displays.

When Lola enters a futuristic spaceship that looks like a giant glowing cube, she hears through her headset a series of murmurs in different languages welcoming her aboard. A single straight passage into the center of the cube is completely see-through, allowing Lola to see the sparks of electrical activity inside the cube extending to all four inner corners. When she touches a random point on the transparent wall, electrical sparks flare wildly at the point of contact, manifesting in Lola's data glove buzzing with force feedback and her VR headset producing a corresponding sound. Once she reaches the center room and presses a red button, Lola is completely consumed by the sensory experience, replicated within the VR, of soaring above the Martian surface on a fictional spaceship.

As Lola's VR experience demonstrates, VR technologies are a natural extension of existing tools of illusion.² Motion pictures have long exploited the human mind's propensity to "fill in" the gaps between "frames" and imagine that it sees an object in continuous motion" when presented with a rapid series of still images.³ Similar to motion pictures' exploitation of the "illusion of continuous motion,"⁴ VR creates an illusory experience through the arrangement of multisensory output to generate a cohesive virtual experience. Although VR applications are more than capable of conveying ideas and aesthetic experiences,⁵ it is currently unclear whether the sensory representation within a VR application would be subject to full protection under U.S. copyright and trade dress laws.

VR technology has significant disruptive potential in different fields, such as social media, video games, entertainment, therapy, educational/military training, and civil and military communication.⁶ This is becoming more evident by the growing number of acquisitions and launches, and the marketing of the technology by different players.⁷

² ROBERT RUSSETT, HYPERANIMATION: DIGITAL IMAGES AND VIRTUAL WORLDS 172 (2009), <http://www.immersence.com/publications/2009/2009-RRussett.html> ("[VR] experiences are completely illusory, in effect, the theatre of the mind.")

³ Vilayanur S. Ramachandran & Stuart M. Anstis, *The Perception of Apparent Motion*, 254 SCI. AM. 102, 102 (1986), available at http://chip.ucsd.edu/pdf/Percept_Apprnt_Mot_Sci_Am.pdf.

⁴ *Id.*

⁵ See *infra* Part I.C.

⁶ See *infra* Part I.

⁷ See, e.g., Beck Besecker, *5 Top Virtual Reality & Augmented Reality Trends for 2015*, MARXENT LABS (Jan. 23, 2015), <http://www.marxentlabs.com/top-virtual-reality-augmented-reality-trends-2015/>.

Whether intellectual property protections are granted is unlikely to halt global progress, and the law will have to decide eventually whether to grant protections to VR technology. Granting legal protection prior to mass consumption seems more appropriate versus a wait-and-see approach; allowing inventors to operate under legal certainties that multisensory schemes are protected creates more incentives for industry and innovation.⁸

This Note argues that existing intellectual property (“IP”) laws can and should apply to protect sensory schemes in virtual environments, similar to the one illustrated above in Lola’s Martian exploration. VR by definition aims to construct an immersive experience in which the human body is able to interact in real-time with the virtual world. Multisensory effect designs, by triggering various sensory cues and manipulating human perception, are the very means through which an experience is delivered to a user. As VR technology becomes more sophisticated in capturing an experience,⁹ protection of distinct sensory effect designs—an important ingredient in VR content—should be anticipated. This Note proposes to identify and anticipate applications of existing copyright and trade dress laws to distinct multisensory schemes consumed by a user in the VR medium.

Part I describes VR as an expressive medium and surveys the current state of VR technology, including the important role of multisensory schemes in immersive virtual environments. Part II examines the copyrightability of VR multisensory schemes and U.S. copyright law’s treatment of works that appeal to different human senses. Given the novelty of the medium in which multisensory effects are perceived, the challenge for current U.S. copyright law lies in its current reluctance to embrace works that appeal to the human senses of touch, smell, or taste.¹⁰ The Note will argue that sensory schemes in virtual environments fall within the scope of copyrightable subject matter and examine the potential extension of current copyright laws to VR sensory effect designs. Part III addresses the possibility of seeking trade dress protection under the federal trademark statute and the obstacles in extending existing doctrines to VR sensory schemes. This section highlights in particular the doctrinal and practical challenges to acquiring or enforcing trade dresses that encompass multisensory effects in a VR application.¹¹ Finally, this Note will argue that copyright law is currently more amenable to safeguarding creative designs of

⁸ *United Carbon Co. v. Binney & Smith Co.*, 317 U.S. 228, 236 (1942) (“A zone of uncertainty which enterprise and experimentation may enter only at the risk of infringement claims would discourage invention.”).

⁹ *See infra* Part I.A.

¹⁰ *See infra* Part III.A.

¹¹ *See infra* Part II.

sensory effects.

I. IMMERSIVE VIRTUAL ENVIRONMENTS

In regard to functionality, VR simulates a realistic-looking world through the use of computer graphics.¹² It uses “three-dimensional computer graphics technology to generate artificial environments that afford real-time interaction and exploration.”¹³ The duality of the concept of perception, namely of a perceiver and a perceived, enables this technology.¹⁴ Just as a painting first needs to be perceived—in this case, seen—by the viewer in order to evoke an aesthetic experience, an inner process of perception by processing and synthesizing various sensory input is vital to the human experience. Similarly, a VR program evokes a subjective inner response to a methodical curation of artificial multisensory stimuli. VR uses a computer to mediate a perceiver’s immediate environment by encapsulating her in a virtual space of multisensory effects.¹⁵ The inventor of the head-mounted display, Ivan Sutherland, suggested in a 1965 paper titled *The Ultimate Display* that a fundamental purpose for a future virtual environment display system was “to serve as a looking-glass into the mathematical wonderland constructed in computer memory.”¹⁶ Furthermore, “the synthetic world is not static, but responds to the user’s input,” such as gestures or verbal commands.¹⁷

The intriguing medium of VR has garnered much attention for its promise of utility in various fields.¹⁸ It currently has expanding applications in entertainment, architecture, particle physics, healthcare, tourism, and military training, and the potential for other uses are also

¹² 1 GRIGORE C. BURDEA & PHILIPPE COIFFET, *VIRTUAL REALITY TECHNOLOGY 2* (2d ed. 2003).

¹³ Craig D. Murray & Judith Sixsmith, *The Corporeal Body in Virtual Reality*, 27 *ETHOS* 315, 316 (1999).

¹⁴ Brian L. Keeley, *Making Sense of the Senses: Individuating Modalities in Humans and Other Animals*, 99 *J. OF PHIL.* 1, Jan. 2002, at 12.

¹⁵ Murray & Sixsmith, *supra* note 13, at 317–18.

¹⁶ Ivan E. Sutherland, *The Ultimate Display*, Proceedings of the International Federation of Information Processing Congress (1965), http://www.cise.ufl.edu/research/lok/teaching/dcvef05/papers/ultimate_display.html.

¹⁷ BURDEA & COIFFET, *supra* note 12.

¹⁸ See, e.g., Howard Rheingold, *Virtual Reality: The Revolutionary Technology of Computer-Generated Artificial Worlds – and How It Promises to Transform Society* (1992) (exploring VR applications in entertainment, architecture, particle physics, and more); ERIN CARSON, *10 WAYS Virtual Reality Is Revolutionizing Medicine and Healthcare*, *TECHREPUBLIC* (Apr. 8, 2015), [HTTP://WWW.TECHREPUBLIC.COM/ARTICLE/10-WAYS-VIRTUAL-REALITY-IS-REVOLUTIONIZING-MEDICINE-AND-HEALTHCARE/](http://www.techrepublic.com/article/10-ways-virtual-reality-is-revolutionizing-medicine-and-healthcare/); Clay Wilson, *Avatars, Virtual Reality Technology, and the U.S. Military: Emerging Policy Issues*, Cong. Res. Serv. (Apr. 9, 2008), <http://fas.org/sgp/crs/natsec/RS22857.pdf> (use of VR by the U.S. military and intelligence community for training and other purposes); Will Coldwell, *Travel Industry Switches on to Virtual Reality*, *GUARDIAN* (Oct. 25, 2014), <http://www.theguardian.com/travel/2014/oct/25/travel-industry-virtual-augmented-reality>.

growing.¹⁹ In addition to practical applications, VR technologies are frequently used as an expressive or artistic medium. Canadian artist Char Davies is a pioneer in an artistic genre that uses VR technologies called immersive virtual art.²⁰ She describes one of her earlier artworks called *Osmose* as:

[A]n immersive interactive virtual-reality environment installation with 3D computer graphics and interactive 3D sound, a head-mounted display and real-time motion tracking based on breathing and balance. There are nearly a dozen “realms” in *Osmose*, metaphorical reconstructions of “nature” as well as philosophical texts and software code. The visual elements within these realms are semitransparent and translucent. *Osmose* is a space for exploring the perceptual interplay between self and world, i.e., a place for facilitating awareness of one’s own self as consciousness embodied in enveloping space.²¹

What is especially unique about Davies’s work is her choice of the primary means with which a participant—or, as Davies calls him or her, an “immersant”—navigates different virtual “realms.”²² An immersant is able to negotiate the virtual environment hands-free as a motion-tracking vest measures breathing and balance.²³ Swimming inside this “mesmerizing spatiality” can evoke powerful feelings in immersants.²⁴ Davies’s work highlights VR as a medium that is capable of not only communicating aesthetic experiences but also allowing a substantial amount of creative control in designing a holistic virtual experience.²⁵

A. *The Current State of VR Technology*

Although VR technology has existed for decades,²⁶ it has only recently become more accessible and mainstream.²⁷ A recent market

¹⁹ See *supra* note 18.

²⁰ Char Davies, IMMERSENSE, <http://www.immersence.com> (last visited Feb. 21, 2016).

²¹ *Id.*; Char Davies, *Changing Space: Virtual Reality as an Arena of Embodied Being*, in MULTIMEDIA: FROM WAGNER TO VIRTUAL REALITY, EXPANDED EDITION 293 (Randall Packer and Ken Jordan eds., 2001), <http://www.immersence.com/>.

²² LAURIE MCROBERT, CHAR DAVIES’ IMMERSIVE VIRTUAL ART AND THE ESSENCE OF SPATIALITY 4 (2007).

²³ Davies, *supra* note 20.

²⁴ MCROBERT, *supra* note 22.

²⁵ Davies, *supra* note 20.

²⁶ ALBERTO GALLACE & CHARLES SPENCE, IN TOUCH WITH THE FUTURE: THE SENSE OF TOUCH FROM COGNITIVE NEUROSCIENCES TO VIRTUAL REALITY 210 (2014) (“One of the earliest attempts to create a simulation involving stimulation presented over different body parts and involving more than one sensory modality at the same time, was the ‘Sensorama,’ developed (and then patented) in 1957”); Matthew Schnipper, *Seeing Is Believing: The State of Virtual Reality*, THE VERGE (Aug. 25, 2014, 10:45 AM) (“the closest modern ancestor [of VR] came to life in the fifties”), <http://www.theverge.com/a/virtual-reality/intro>.

²⁷ Erik Heinrich, *Virtual Reality: It’s Not Just for Video Games*, FORTUNE (May 5, 2014, 4:02

research report estimates that by 2018 the VR industry, including augmented reality,²⁸ will be worth \$1.06 billion.²⁹ Earlier applications of VR faced significant technical challenges.³⁰ It is especially difficult to construct an immersive virtual environment in which coherent, high-fidelity visual, auditory, and haptic stimuli can induce the user into believing that the environment is “real.”³¹

If a technology used to render a virtual representation is not refined enough to create a sense of realness in a user’s body, it will often generate discomfort or sickness due to the harsh conflict between sensory inputs.³² The human body has multiple essential, albeit unconscious, systems—e.g., the endocrine system, vestibular system, and proprioceptors—that govern and gauge important information such as balance, spatial position, exertions, and even stress levels.³³ Latency in a VR program could disrupt these various systems by conveying conflicting “stories” about the external world and induce nausea, a common response to sensory cacophony.³⁴

Due to recent software and hardware advances, however, the problem of discomfort generated during use of VR equipment is quickly abating. New VR technology can now deliver the highest level of immersion—i.e., total immersion—in a virtual environment.³⁵ For

PM), <http://fortune.com/2014/05/05/virtual-reality-its-not-just-for-video-games/> (“Virtual reality technology is poised to take off for home entertainment and gaming as inexpensive headsets become commercially available . . .”).

²⁸ “Augmented reality (AR) is a live, direct or indirect, view of a physical, real-world environment whose elements are augmented by computer-generated sensory input such as sound, video, graphics or GPS data.” *Augmented Reality*, MASHABLE, <http://mashable.com/category/augmented-reality/> (last visited Oct. 3, 2014).

²⁹ Tom Sandford, *The \$1.06 Billion Industry With True Potential*, INVESTMENT U (Sept. 30, 2014), <http://www.investmentu.com/article/detail/40168/invest-virtual-reality-industry#.VF0-v4dN3zI>.

³⁰ Farhad Manjoo, *If You Like Immersion, You’ll Love This Reality*, N.Y. TIMES (Apr. 2, 2014) <http://www.nytimes.com/2014/04/03/technology/personaltech/virtual-reality-perfect-for-an-immersive-society.html> (“For years, the most convincing criticism of virtual reality was that the technology just wouldn’t be good enough. That’s still the main criticism.”).

³¹ *Id.* (“The [VR] simulator’s fidelity depends on how accurately it can track your movements, and how quickly it can adjust the image to match the motion. If the technology is just a little off, the simulation fails.”); Hunter G. Hoffman et al., *The Illusion of Presence in Immersive Virtual Reality During an fMRI Brain Scan*, 6 CYBERPSYCHOLOGY & BEHAVIOR 127, 130 (2003), <http://www.hitl.washington.edu/people/hunter/magnetbrenda.pdf> (confirming stronger illusions of presence in VR in a high-tech condition than in a low tech condition through the use of fMRI brain scans).

³² Virginia Heffernan, *Virtual Reality Fails Its Way to Success*, N.Y. TIMES (Nov. 14, 2014), <http://www.nytimes.com/2014/11/16/magazine/virtual-reality-fails-its-way-to-success.html>.

³³ *Id.*

³⁴ *Id.*

³⁵ There are three distinct, increasing levels of immersion in VR: engagement, engrossment, and total immersion. Charlene Jennett et al., *Measuring and Defining the Experience of Immersion in Games*, 66 INT’L J. HUM.-COMPUTER STUD. 641, 642 (2008) (“In total immersion gamers described a sense of presence, being cut off from reality to such an extent that the game was all that mattered.”).

example, the Oculus Rift, a VR headset first developed in 2012, now delivers a compelling immersive experience in which the user truly feels as though he is actually in that virtual world.³⁶ While discomfort and dizziness due to high latency were common among earlier prototypes, the Oculus Rift is believed to have finally overcome the latency barrier.³⁷ Oculus VR, the company behind the Rift headset, dubs its pioneering headset “Next-Gen Virtual Reality” and boasts the headset’s low latency 360-degree head tracking, stereoscopic 3D view, and ultra wide field of view.³⁸ Another influential game maker named Valve claims that “zero percent of people get motion sick” while trying its VR system, which uses lasers to accurately track a user’s real-world movements.³⁹ High-level immersion, such as that which the Oculus Rift attains, is important because the premise of a VR world hinges on the user’s ability to “naturally” manipulate the virtual world via her motor responses, while a seamless, lag-free visual display transports her to a digitally simulated world, either real or imagined.⁴⁰

The advent of promising immersion technology and the potential to drastically expand the popular use of VR beyond gaming elicited a quick response from the market. In March 2014, Facebook acquired Oculus VR for two billion U.S. dollars,⁴¹ betting on Oculus’s potential to be the “most social platform ever.”⁴² Jaunt, a budding technology company aiming to bring immersive cinematic VR to the masses using the Oculus platform, continues to successfully acquire massive funding from keen investors.⁴³ In addition, major technology companies are further fueling a mainstream consumption of VR content by using the ubiquitous smartphone as a portal to VR.⁴⁴ Smartphone VR exploits the

³⁶ Simon Parkin, *Oculus Rift’s Virtual Reality Headset Could Kick-Start a Revolution Beyond Video Games*, MIT TECH. REV., <http://www.technologyreview.com/featuredstory/526531/oculus-rift/> (last visited Feb. 21, 2016).

³⁷ Heffernan, *supra* note 32; Colin Barras, *How Virtual Reality Overcame Its ‘Puke Problem’*, BBC (Mar. 17, 2014), <http://www.bbc.com/future/story/20140327-virtual-realitys-puke-problem>.

³⁸ Oculus VR, <http://www.oculusvr.com/rift/> (last visited Feb. 21, 2016).

³⁹ Nick Wingfield, *To Bring Virtual Reality to Market, Furious Efforts to Solve Nausea*, N.Y. TIMES (Mar. 4, 2015), <http://www.nytimes.com/2015/03/05/technology/solution-to-nausea-puts-virtual-reality-closer-to-market.html>.

⁴⁰ Manjoo, *supra* note 30; BURDEA & COIFFET, *supra* note 12, at 2.

⁴¹ Brian Solomon, *Facebook Buys Oculus, Virtual Reality Gaming Startup, For \$2 Billion*, FORBES (Mar. 25, 2014, 5:43 PM), <http://www.forbes.com/sites/briansolomon/2014/03/25/facebook-buys-oculus-virtual-reality-gaming-startup-for-2-billion/>.

⁴² Samantha Murphy Kelly, *What Is Oculus Rift – and Why Should You Care?*, MASHABLE (Mar. 26, 2014), <http://mashable.com/2014/03/26/oculus-rift-explained/>.

⁴³ *Jaunt Announces \$27.8 Million Funding to Scale Its Cinematic VR Technology*, JAUNT (AUG. 21, 2014), <https://jaunt.squarespace.com/funding-announcement/>.

⁴⁴ Joshua Brustein, *Samsung Makes Oculus Virtual Reality a Phone Accessory*, BLOOMBERG BUSINESS (Sept. 3, 2014), <http://www.bloomberg.com/bw/articles/2014-09-03/samsung-partners-with-oculus-to-make-virtual-reality-headset>; David Pierce, *The Future of Virtual Reality Is Inside Your Smartphone*, WIRED (Mar. 6, 2015, 11:00 AM), <http://www.wired.com/2015/03/future-virtual-reality-inside-smartphone/>; Cosmin Vasile, *Oculus Rift Native Apps Coming to Windows Phone, Android and iOS*, SOFTPEDIA (Sept. 22, 2014), <http://news.softpedia.com/news/Oculus->

high processing power of today's smartphones to both display movies and games and renders VR effects inside the headset.⁴⁵ Then, the user would strap the smartphone to her face to produce stereoscopy.⁴⁶

With this renewed interest in the VR platform, as well as the accelerating rate of development of the VR technology,⁴⁷ there will be a corresponding increase in demand for, and production of, VR content.⁴⁸ As such, the development and design of multisensory effects that enhance the user's VR experience will also become increasingly important in the rapid expansion of the VR industry.

B. *Multisensory Effects in Virtual Environments*

Perception in the real world is inherently multisensory.⁴⁹ Consequently, the next and current steps in making immersive virtual environments even more "real" is to design an experience that targets multiple sensory modalities simultaneously.⁵⁰ For example, after creating a visual, stereoscopic rendition of a virtual beach, a VR designer could incorporate into the audiovisual space the sound of rolling waves, the scent of the ocean, and a gentle breeze upon the skin. The attempt to evoke multiple senses simultaneously is hardly novel. Robert Russett, a media artist and writer, asserts that "[a]n interest in environmental aesthetic experiences can be traced through nearly all epochs of art history," and the interest in VR is "a contemporary manifestation of an enduring innate urge to create art works that are immersive and polysensory."⁵¹

In 1957 Morton Heilig, the "father of VR," developed and patented a photo-booth-like machine named the Sensorama in which "the user was presented with 3D images, smells, stereo sound, wind, and vibrations."⁵² Russett cites the theories on multisensory 3D movies by Sergei Eisenstein, the intermedia art performances, and expanded cinema of the 1960s and 1970s as recent examples of the "age-old tendency" for humans to seek environmental aesthetic experiences.⁵³

Rift-Native-Apps-Coming-to-Windows-Phone-Android-and-iOS-459476.shtml.

⁴⁵ Pierce, *supra* note 44.

⁴⁶ *Id.*

⁴⁷ Wingfield, *supra* note 39 ("Tim Sweeney, founder of Epic Games, a game publisher, said the development of virtual reality technology was accelerating.")

⁴⁸ See, e.g., Jonathan Shieber, *Virtual Reality Gets a Real Content Studio with Launch of Alchemy VR*, TECHCRUNCH (July 7, 2014), <http://techcrunch.com/2014/07/07/virtual-reality-gets-a-real-content-studio-with-launch-of-alchemy-vr/>.

⁴⁹ Murray & Sixsmith, *supra* note 13, at 323.

⁵⁰ See Alexis Madrigal, *Researchers Want to Add Touch, Taste and Smell to Virtual Reality*, WIRED (Mar. 4, 2009, 3:07 PM), <http://www.wired.com/2009/03/realvirtuality/>; David Murphy, *Feelreal Brings Real Scents, Heat, and Water to Virtual Reality*, PC MAG. (Mar. 8, 2015, 5:35 PM), <http://www.pcmag.com/article2/0,2817,2477956,00.asp>.

⁵¹ RUSSETT, *supra* note 2, at 172.

⁵² GALLACE & SPENCE, *supra* note 26, at 210.

⁵³ RUSSETT, *supra* note 2, at 172.

Wide-screen cinema, holography, and stereoscopic IMAX movies further demonstrate the current reaches of the impulse to design and consume complex illusionistic effects.⁵⁴

In the mid-1960s computer scientist Ivan Sutherland invented the HMD, which evolved throughout the decades to culminate in the Oculus VR.⁵⁵ The HMD places small viewing screens in front of each eye to create the stereoscopic effect—the illusion of three-dimensional depth in a flat image.⁵⁶ Stereoscopy exploits the characteristics of human binocular vision and introduces a radically new perceptual dimension.⁵⁷ Because VR headsets tend to block the user’s sensory input from her immediate physical surroundings and replace them with synthetic stimuli, complex artificial sensory schemes in a VR application that mimic real-life body sensations aid in achieving the sense of presence in a virtual world.⁵⁸

Currently, the dominant means of generating an immersive experience is the 3D audiovisual schema via the HMD,⁵⁹ but complementing the visual and the aural with additional senses can lead to surprising enhancements of a VR experience. For instance, the addition of touch or smell sensations can affect a user’s memory of an immersive experience⁶⁰ and even induce emotional reactions.⁶¹ The FEELREAL VR mask,⁶² which straps on to an existing HMD, such as the Oculus Rift, is able to “recreat[e] sensations using a variety of techniques: Odors blasted toward your nose, hot air sent across your face, and a gentle water misting dripped onto your cheeks.”⁶³

The haptic—or tactile—modality is especially important in delivering a realistic VR experience.⁶⁴ When a user touches a virtual

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ *Id.*

⁵⁷ *Stereoscopy*, ENCYC. BRITANNICA (June 27, 2013), <http://www.britannica.com/EBchecked/topic/565664/stereoscopy>.

⁵⁸ See Madrigal, *supra* note 50; R. Tortell et al., *The Effects of Scent and Game Play Experience on Memory of a Virtual Environment*, 11 VIRTUAL REALITY 61, 62 (2007) (“Presentation of scent is another method by which a user’s attention can be shifted into the virtual world, heightening his sense of presence. The idea of increasing sensory modalities to improve sense of presence has been empirically supported”); GALLACE & SPENCE, *supra* note 26, at 206.

⁵⁹ BURDEA & COIFFET, *supra* note 12, at 60.

⁶⁰ Tortell et al., *supra* note 58, at 66 (“Scent presentation . . . had a positive effect on subjects’ recall of the [immersive virtual] environment”).

⁶¹ MARIO GUTIERREZ ET AL., STEPPING INTO VIRTUAL REALITY 4 (2008) (“Presence can lead to involvement and emotional reactions from the user. Once the brain integrates the 3D images, sounds, and other kinds of feedback in the form of a coherent environment, different reactions can arise.”).

⁶² See FEELREAL, <http://feelreal.com> (last visited Mar. 14, 2015).

⁶³ Murphy, *supra* note 50.

⁶⁴ GALLACE & SPENCE, *supra* note 26, at 206 (“[W]ithout tactile sensation, VR simply does not seem to deliver the degree of ‘presence’ that would be required to make a simulation ‘believable’ by the user”).

object in a VR program, the haptic interface is able to reproduce appropriate sensations of force.⁶⁵ The force feedback provides “three-dimensional information, such as thickness and weight of an object.”⁶⁶ The prevailing means for transmitting haptic feedback is the data glove, a wired interface worn by a user with “tactile or other sensory units attached to the fingers or joints of the glove.”⁶⁷ Unlike trackballs⁶⁸ or other traditional input devices—such as the keyboard and mouse—that have single-point interaction with the virtual environment, data gloves “allow dexterous, multipoint interaction at the fingertips or palm.”⁶⁹ A VR user may manipulate and interact directly with virtual objects via the data glove, which captures the user’s input as it occurs in real time and transmits the information back to the host computer running the VR simulation.⁷⁰ Since the first data glove appeared in the commercial marketplace in 1987,⁷¹ data glove technology has evolved rapidly. In 2009 a company called AnthroTronix released its first commercial version of the AcceleGlove, a user-programmable glove that records hand and finger movements in 3D.⁷² The AcceleGlove is especially notable in its flexibility to accommodate different software and competitive pricing compared to other data gloves.⁷³

With the help of multisensory effects that are becoming increasingly sophisticated, VR technology is heading toward creating or replicating a credible human experience.⁷⁴ The trend in the development of VR technology is to add compelling multisensory components in order to create a believable virtual world.⁷⁵ Facebook founder and CEO Mark Zuckerberg called VR “a new communication platform” in which “unbounded spaces and experiences with the people in your life” can be shared.⁷⁶

Despite the foreseeable proliferation of immersive VR content that

⁶⁵ Masayuki Hara et al., *Perceptual Illusion in Virtual Reality Using Haptic Interface*, 4 INTELLIGENT ROBOTS & SYS. 3901, 3901 (2004).

⁶⁶ *Id.*

⁶⁷ PRASHAN PREMARATNE, HUMAN COMPUTER INTERACTION USING HAND GESTURES 5 (2014).

⁶⁸ A trackball is “a sensorized cylinder that measures three forces and three torques applied by the user’s hand on a compliant element.” BURDEA & COIFFET, *supra* note 12, at 44.

⁶⁹ *Id.* at 47.

⁷⁰ *Id.* at 54.

⁷¹ PREMARATNE, *supra* note 67, at 7.

⁷² Kristina Grifantini, *Open-Source Data Glove*, MIT TECH. REV. (June 23, 2009), <http://www.technologyreview.com/article/414021/open-source-data-glove/>.

⁷³ *Id.*

⁷⁴ One of the definitions of “experience,” according to the *Oxford English Dictionary*, is “[t]he fact of being consciously the subject of a state or condition, or of being consciously affected by an event. Also an instance of this; a state or condition viewed subjectively; an event by which one is affected.” This definition curiously mirrors the ultimate goal of VR: delivering immersion and presence.

⁷⁵ Madrigal, *supra* note 50.

⁷⁶ Mark Zuckerberg, FACEBOOK (Mar. 25, 2015), <https://www.facebook.com/zuck/posts/10101319050523971>.

targets multiple senses, a discussion regarding IP protection of the multisensory schemes in VR content is absent.⁷⁷ The plain language of the U.S. Copyright Act, for instance, extends protection limited to the software or audiovisual aspects of a VR application.⁷⁸ VR technology, however, comprises more than computer software; it also affects a broader field of human perception that is not restricted to the audiovisual. That is why the law should extend its protection to otherwise-eligible works that exploit additional senses, including, but not limited to, tactile and olfactory stimuli.

C. Why Sensory Schemes in Immersive VR Programs Should Be Protected by IP Laws

Copyright law has yet to distinguish conceptually the sensorial impact a VR program generates from its traditionally protectable parts, such as the software code, audiovisual work, and graphical interface.⁷⁹ However, distinct treatment of VR content, such as the expression carried out by triggering the senses, is needed to ensure copyright protection of these works for several reasons. First, computer-generated virtual environments capitalize upon natural human perception by extending visual and other sensory information in three-dimensional space.⁸⁰ It follows that effective design of a user's sensory experience, via seamless, real-time interactivity, is one of the most crucial aspects of VR content.⁸¹ Because much of the value and appeal of a VR experience hinges on the sensorial impacts of a design, the sensory scheme—the sequence, arrangement, or transposition of multisensory inputs—should be recognized and safeguarded by copyright and trade dress laws as a protectable component of VR design.

Second, VR is more than a branch of computer science, and the law should treat it accordingly.⁸² A defined purpose of VR is “to make possible a *sensorimotor* and cognitive activity for a person (or persons) in a digitally created artificial world, which can be imaginary, symbolic or a simulation of certain aspects of the real world.”⁸³ In other words,

⁷⁷ Joshua A. T. Fairfield, *Mixed Reality: How the Laws of Virtual Worlds Govern Everyday Life*, 27 BERKELEY TECH. L.J. 55, 59 (2012) (“Over 200 articles have been published on law and virtual worlds or virtual reality in recent years.”). However, legal scholarship concerning VR has mostly focused on the interplay between real-world regulatory regimes and online communities.

⁷⁸ 17 U.S.C. § 102(a) (2014).

⁷⁹ See *infra* Part II.A.

⁸⁰ John Wann & Mark Mon-Williams, *What Does Virtual Reality Need?: Human Factors Issues in the Design of Three-Dimensional Computer Environments*, 44 INT’L J. HUM.-COMPUTER STUD. 829, 842 (1996).

⁸¹ BURDEA & COIFFET, *supra* note 12, at 2 (“Here real time means that the computer is able to detect a user’s input and modify the virtual world instantaneously.”).

⁸² *Computer Science*, OXFORD ENG. DICTIONARY, <http://www.oed.com> (last visited Feb. 28, 2015) (“The branch of knowledge concerned with the construction, programming, operation, and use of computers.”).

⁸³ *Virtual Reality: Concepts and Technologies 6* (Philippe Fuchs et al. eds., 2011).

the ultimate aim of VR is to provide a seamless, holistic *experience* in which the user can manipulate and interact with the virtual environment in a sufficiently “natural” way.⁸⁴ In addition to virtual duplications of reality, it is even possible to deliberately manipulate human perception in virtual space in order to achieve a desired effect, such as tricking the brain into boosting a chronic pain sufferer’s “range of pain-free movement” through “bogus visual feedback.”⁸⁵ As such, the cognitive, perceptive, or even social processes of the user are a necessary part of an immersive VR experience package and enabled by the various sensory cues and effects that a VR designer intends to invoke in the user.⁸⁶ Due to the crucial role that human senses and perception play in virtual experiences, the ways in which IP laws can protect deliberate and unique sensory representations should be anticipated.

Recent trends in IP law further reflect the desire to extend IP protection to nontraditional works that involve taste, smell, or touch.⁸⁷ The proliferation of nontraditional marks—color, sound, scent, taste, tactile, and even holographic—registered with the United States Patent and Trademark Office (the “USPTO”) is one example.⁸⁸ Scent marks in particular are becoming increasingly popular, as the imitation (or exploitation) of the senses or certain aesthetics is revealed to play a significant role in consumer psychology.⁸⁹ In 2013, the USPTO issued a trademark to the technology giant Apple for the design and layout of its signature retail store, which, in the abstract sense, trademarks an in-store *experience*.⁹⁰ These instances indicate that IP law is slowly responding to a rising demand and need for IP protection for increasingly amorphous or *sui generis*⁹¹ subjects.⁹² Therefore, VR

⁸⁴ See, e.g., BURDEA & COIFFET, *supra* note 12, at 2.

⁸⁵ Brian Handwerk, *Use Virtual Reality to Eliminate That Pain in Your Neck*, SMITHSONIAN.COM (Feb. 26, 2015), <http://www.smithsonianmag.com/science-nature/use-virtual-reality-eliminate-pain-your-neck-180954422/?no-ist>.

⁸⁶ See Virtual Reality: Concepts and Technologies, *SUPRA* NOTE 83, AT 4.

⁸⁷ See, e.g., Anne Gilson LaLonde & Jerome Gilson, *Getting Real with Nontraditional Trademarks: What’s Next After Red Oven Knobs, the Sound of Burning Methamphetamine, and Goats on a Grass Roof?*, 101 TRADEMARK REP. 186 (2011).

⁸⁸ See, e.g., Amanda E. Compton, *Acquiring a Flavor for Trademarks: There’s No Common Taste in the World*, 8 NW. J. TECH. & INTELL. PROP. 340 (2010); Jerome Gilson & Anne Gilson LaLonde, *Cinnamon Buns, Marching Ducks and Cherry-Scented Racecar Exhaust: Protecting Nontraditional Trademarks*, 95 TRADEMARK REP. 773 (2005).

⁸⁹ See, e.g., MP Mueller, *The Sweet Smell of Marketing Success*, N.Y. TIMES: YOU’RE THE BOSS (July 29, 2010), <http://boss.blogs.nytimes.com/2010/07/29/the-sweet-smell-of-marketing-success/>.

⁹⁰ Retail store services featuring computers, computer software, computer peripherals, mobile phones, consumer electronics and related accessories, and demonstration of products relating thereto, Registration No. 4,277,913.

⁹¹ *Sui Generis*, BLACK’S LAW DICTIONARY (10th ed. 2014) (“The term [*sui generis*] is used in intellectual-property law to describe a regime designed to protect rights that fall outside the traditional patent, trademark, copyright, and trade-secret doctrines.”).

⁹² See *supra* notes 87–88.

sensory effect designs, provided they are sufficiently distinct or original, should be protected by IP laws.

II. COPYRIGHT LAW

A. *The Human Senses and U.S. Copyright Law*

U.S. copyright laws originate from the Constitution's empowerment of Congress to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."⁹³ Implied in this constitutional mandate is the necessity for copyright law to balance two competing interests: incentivizing the creation of original works without fear of misappropriation by others; and allowing the public to have access to those works, which would promote progress.⁹⁴

Section 102(a) of the Copyright Act,⁹⁵ although not exhaustive,⁹⁶ lists eight categories of works that are subject to copyright protection: literary works, musical works, dramatic works, pantomimes and choreographic works, pictorial, graphic, and sculptural works, motion pictures and other audiovisual works, sound recordings, and architectural works.⁹⁷ As the list suggests, copyright protection in the U.S. is traditionally granted only to works that appeal to the senses of sight and hearing.⁹⁸ Works that evoke the rest of the human senses—touch, smell, and taste—have been neglected from copyright protection thus far,⁹⁹ and only selectively embraced by patent law.¹⁰⁰ For instance,

⁹³ U.S. CONST. art. I, § 8, cl. 8.

⁹⁴ 4 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 1.03 (2014) [hereinafter NIMMER ON COPYRIGHT] ("[T]he authorization to grant to individual authors the limited monopoly of copyright is predicated upon the dual premises that the public benefits from the creative activities of authors, and that the copyright monopoly is a necessary condition to the full realization of such creative activities.").

⁹⁵ 17 U.S.C. § 101 et seq. (2014).

⁹⁶ NIMMER ON COPYRIGHT, *supra* note 94, § 2.03 ("[I]t is also clear that 'works of authorship' are not necessarily limited to the eight broad categories of works listed under Section 102(a).").

⁹⁷ 17 U.S.C. § 102(a) (2014).

⁹⁸ Christopher Buccafusco, *Making Sense of Intellectual Property Law*, 97 CORNELL L. REV. 501, 505 (2012) (arguing that intellectual property law "has established a dichotomy between works appealing to the different human senses. . . . Works that appeal to the senses of sight and hearing—those that produce visual or aural sensation—are potentially subject to copyright protection," while works invoking the other senses are not.); *see also* Leon Calleja, *Why Copyright Law Lacks Taste and Scents*, 21 J. INTEL. PROP. L. 1 (2013).

⁹⁹ *See, e.g.*, *Publ'ns Int'l Ltd. v. Meredith Corp.*, 88 F.3d 473 (7th Cir. 1996) (denying copyright protection of culinary recipes included in a cookbook); *OddzOn Products, Inc. v. Oman*, 924 F.2d 346 (D.C. Cir. 1991) (holding that the Copyright Office did not abuse its discretion in refusing to register plaintiff's "KOOSH" ball); Olivia Su, Note, *Odor in the Courts! Extending Copyright Protection to Perfumes May Not Be So Nonscentical: An Investigation of the Legal Bulwarks Available for Fine Fragrances Amid Advancing Reverse Engineering Technology*, 23 S. CAL. INTERDISC. L.J. 663, 695 (2014) ("Though there has yet to be any case law regarding the direct application of copyright to perfumes in the U.S., strong arguments have been made on both sides regarding the copyright eligibility of perfumes in the E.U."); Christopher J. Buccafusco, *On the*

the Copyright Office notes that “mere listing[s] of ingredients or contents” in culinary recipes as copyright ineligible.¹⁰¹

In his recent article Professor Buccafusco articulates the sensory dichotomy we now see in IP law and asserts that the dichotomy parallels the Western aesthetic theory in which sight and hearing have traditionally been considered “high” senses, whereas touch, smell, and taste belonged to the “low” senses.¹⁰² The differential treatment of the senses in IP law, Professor Buccafusco observes, has led to a sensory hierarchy in which “sight and sound have been found to involve better, nobler, and purer experiences.”¹⁰³ As a result, copyright law shelters only works that appeal to the “high” senses, a practice that becomes especially apparent when courts articulate the distinction between aesthetic and utilitarian objects in determining copyrightability of useful articles with pictorial, graphic, and sculptural aspects.¹⁰⁴

Another copyright concept that is frequently implicated in works concerning the “low” senses¹⁰⁵ is the idea-expression dichotomy articulated in the seminal Supreme Court case, *Baker v. Selden*.¹⁰⁶ Plaintiff Baker sought copyright protection for his books that explained a unique system of bookkeeping.¹⁰⁷ Baker’s books included supplementary forms to be used in conjunction with the bookkeeping system.¹⁰⁸ Plaintiff attempted to assert copyright for the bookkeeping method after the defendant published a book with similar but distinct forms designed to promote the same method of bookkeeping.¹⁰⁹ The Court rejected the plaintiff’s argument, stating that “where the art it teaches cannot be used without employing the methods and diagrams used to illustrate the book, or such as are similar to them, such methods and diagrams are to be considered as necessary incidents to the art, and given therewith to the public.”¹¹⁰ In other words, the Court refused to grant copyright protection to a method, which would grant a monopoly

Legal Consequences of Sauces: Should Thomas Keller’s Recipes Be Per Se Copyrightable?, 24 CARDOZO ARTS & ENT. L.J. 1121 (2007).

¹⁰⁰ Buccafusco, *supra* note 98, at 511–12 (“Patent law is left to govern products that appeal to the other senses of touch, taste, and smell as well as those whose usefulness has no relation to the human body”).

¹⁰¹ 37 C.F.R. § 202.1 (a) (2014).

¹⁰² Buccafusco, *supra* note 98, at 527.

¹⁰³ *Id.* at 528.

¹⁰⁴ *Id.* at 531 (“Courts faced with the task of separating the aesthetic from the functional [in copyright law’s separability analysis] often turn to the existence of constraints on the designer on the assumption that, unlike functional features, aesthetic features of a product are unconstrained.”).

¹⁰⁵ The tactile, olfactory, and gustatory senses. *Id.* at 527.

¹⁰⁶ *Baker v. Selden*, 101 U.S. 99 (1879).

¹⁰⁷ *Id.* at 100.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ *Id.* at 103.

in the underlying art itself. To apply the *Baker* court's reasoning to the VR context, multisensory effects that implicate the "low" senses are susceptible to being classified as a "method" or as "necessary incident[] to the art," rather than a separate, copyrightable expression.¹¹¹

The Copyright Act codifies the exclusion of ideas or methods in § 102(b): "In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work."¹¹² The idea-expression dichotomy essentially reserves ideas, methods, and systems to the public domain, allowing the content to be used or copied by anyone.¹¹³ The plain language of the current copyright statute does not contemplate protection of a VR program that, for example, uses an intricate tactile effect scheme. A careful design of tactile effects that are delivered through a data glove can be characterized as a method of operation that is incident to the copyrightable expression, which is limited to the audiovisual expression and the software code for the VR program.

B. *Overcoming the Subject Matter Barrier of Copyright Eligibility*

Copyright law's preferential treatment of the visual and the aural lacks constitutional or statutory backing. The Intellectual Property Clause¹¹⁴ certainly does not designate a hierarchical treatment of works appealing to different human senses, nor does it define the "science and useful arts" that it wishes to promote.¹¹⁵ Hence, the constitutional threshold for copyrightability requires only an originality analysis,¹¹⁶ as well as a balancing of the competing interests of an author and the public's access to the works.¹¹⁷ It does not preclude from consideration works that appeal to the sensation of touch, taste, or smell.¹¹⁸

Moreover, the Copyright Act and its legislative history reflect

¹¹¹ *Id.*

¹¹² 17 U.S.C. § 102(b) (2014).

¹¹³ *See, e.g.,* *Mattel, Inc. v. Goldberger Doll Mfg. Co.*, 365 F.3d 133, 136 (2d Cir. 2004) ("An upturned nose, bow lips, and wide eyes are the 'idea' of a certain type of doll face. That idea belongs not to Mattel but to the public domain.").

¹¹⁴ U.S. CONST. art. I, § 8, cl. 8.

¹¹⁵ NIMMER ON COPYRIGHT, *supra* note 94, § 1.03 (The phrase ["To promote the progress of science and useful arts"] "is in the main explanatory of the purpose of copyright, without in itself constituting a rigid standard against which any copyright act must be measured. Its effect at most is to suggest certain minimal elements to be contained in copyright legislation.").

¹¹⁶ *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 346 (1991) ("Originality is a constitutional requirement.").

¹¹⁷ The fixation requirement under Copyright Act § 102(b) is not covered in this Note. A multisensory scheme in a VR program would be "sufficiently permanent or stable" to meet the fixation threshold, analogous to how the audiovisual effects in video games are considered fixed. 17 U.S.C. § 101 (2014); *Williams Elec., Inc. v. Artic Int'l, Inc.*, 685 F.2d 870 (3d Cir. 1982).

¹¹⁸ *See* 17 U.S.C. § 101 (2014).

foresight and intent to expand the scope of copyrightable subject matter to accommodate future technological advances as well as to avoid absolute preclusion of materials that previously considered unsuitable for copyright.¹¹⁹ For example, the enumeration in § 102 of the Act of copyrightable subject matter is not exhaustive,¹²⁰ and Congress added a brand new category, architectural works, in 1990.¹²¹ Furthermore, the House Report suggests that the subject matter of copyright may be expanded to include “those in which ‘scientific discoveries and technological developments have made possible new forms of creative expression that never existed before,’ and [] those ‘in existence for generations or centuries [but that] have only gradually come to be recognized as creative and worthy of protection.’”¹²² Both of these categories leave open the possibility of embracing works that appeal to taste, touch, and smell as copyrightable subject matter.

Without constitutional or statutory prohibition against copyrighting works that appeal to the traditionally “low” senses, copyright eligibility of these works can and should be reconsidered. Indeed, Professor Buccafusco challenges the sensory dichotomy and proposes a uniform treatment of the senses in IP law: “IP law, at least as a formal, doctrinal matter, should recognize the unity of sensory experience. Appeals to the senses of touch, taste, and smell should join those of sight and sound in copyright’s realm.”¹²³

The unique characteristics of virtual sensory schemes do not necessitate a significant overhaul of existing copyright doctrines or the alleged sensory dichotomy. Instead, virtual sensory schemes are a natural extension of works in other media that already fall under copyright protection.¹²⁴ Consider the history and the development of various media through which people sought communication of ideas and experiences. The walls of a cave were once used as a practical medium for communicating a thought by means of pictorial depictions.¹²⁵ As with any painting, a cave painting engages the viewer by seducing the imagination through depictions of abstract thought.¹²⁶ With the development of written language—and later the printing press—the era of literary communication began. Although unadorned writings do not evoke non-visual sensory responses, they are

¹¹⁹ See, e.g., H.R. REP. NO. 2237, 89th Cong., 2d Sess. at 51 (1966).

¹²⁰ See NIMMER ON COPYRIGHT, *supra* note 94.

¹²¹ NIMMER ON COPYRIGHT, *supra* note 94, § 2.03 n.6 (“[Architectural works were] added [to § 102(a)] by amendment to the 1976 Act in 1990.”).

¹²² NIMMER ON COPYRIGHT, *supra* note 94, § 2.03 (quoting H.R. REP. NO. 2237, 89th Cong., 2d Sess. at 51 (1966)).

¹²³ Buccafusco, *supra* note 98, at 542.

¹²⁴ Manjoo, *supra* note 30.

¹²⁵ Jonathan Amos, *Red Dot Becomes ‘Oldest Cave Art’*, BBC NEWS (June 14, 2012), <http://www.bbc.com/news/science-environment-18449711>.

¹²⁶ *Id.*

nevertheless capable of engaging the reader's imagination. Continuing this evolution, the film camera allowed a photographer to capture and convey an aesthetic expression through a two-dimensional photograph.¹²⁷ Until the advent of motion pictures with sound, most expressive forms only existed in visual mediums, a constraint mirroring the technological limitations of the time. Film conveys a coherent narrative by curating moving images and sounds in a convincing manner and projecting them onto a flat screen.¹²⁸ VR, then, can be conceived as a medium that attempts to convey a credible virtual experience by evoking additional sensory modalities,¹²⁹ which in turn stimulate the powers of imagination to their fullest extent. Virtual sensory schemes merely *add* nontraditional components—e.g., haptic or olfactory stimuli—to an audiovisual work, which, on its own, may be copyrightable under the Copyright Act.¹³⁰ Therefore, a multisensory scheme can and should be considered as a compilation of sensory effects that enhances an underlying audiovisual work.

Virtual sensory designs can be further distinguished from other works that involve only the “low,” proximate senses. The rationale behind denying copyright protection to works that appeal to taste demonstrates that the same reason does not apply to VR sensory schemes. In *Publications International, Ltd. v. Meredith Corp.*, the Seventh Circuit concluded that the compilation of Dannon Yogurt recipes is copyright eligible, but not the individual recipes.¹³¹ The reasoning was that the recipes “contain no expressive elaboration upon either of these functional components, as opposed to recipes that might spice up functional directives by weaving in creative narrative.”¹³² The court distinguished between functional and creative elements and categorized individual recipes as functional.¹³³ In applying the *Meredith* court's reasoning to VR multisensory schemes, it is the *compilation* of various sensory effects,¹³⁴ rather than the individual sensory elements, that necessitates copyright protection. Distinct arrangements of sensory effects have the potential to provide a “creative narrative” that the

¹²⁷ See HELMUT GERNSHEIM, A CONCISE HISTORY OF PHOTOGRAPHY (3d ed. 1986).

¹²⁸ *The Early History of Motion Pictures*, PBS ONLINE (July 23, 2004), http://www.pbs.org/wgbh/amex/pickford/peopleevents/e_silents.html (last visited Feb. 28, 2015).

¹²⁹ For example, the trend with haptic displays is “to represent the world as realistically as possible. Abstract haptic representations are seldom used.” WILLIAM R. SHERMAN & ALAN B. CRAIG, UNDERSTANDING VIRTUAL REALITY: INTERFACE, APPLICATION, AND DESIGN 230 (2003).

¹³⁰ 17 U.S.C. § 101 (2014) (definition of “audiovisual works”).

¹³¹ *Publ'ns Int'l Ltd. v. Meredith Corp.*, 88 F.3d 473, 480 (7th Cir. 1996).

¹³² *Id.*

¹³³ *Id.*

¹³⁴ The U.S. Supreme Court has also held that an original selection or arrangement of traditionally uncopyrightable public domain materials can be copyright eligible. *Feist Publ'ns, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 349 (1991).

Meredith court found lacking in an individual recipe.¹³⁵ Just as “[t]he identification of ingredients necessary for the preparation of each dish is a statement of facts,”¹³⁶ and thereby precluded from copyright protection, a mere use of a particular sensory effect would not be copyright eligible. Instead, a VR designer could reasonably argue that the particular, unique sequence and arrangement of multisensory effects and the creative expression that results from such design overcome the idea-expression dichotomy.

In addition, culinary recipes are subject to scrutiny under the originality requirement, which, this Note argues, can be overcome in the context of VR.¹³⁷ Melville Nimmer opined the following in regards to the copyrightability of culinary recipes:

[Extending copyright protection to recipes] seems doubtful because the content of recipes are clearly dictated by functional considerations, and therefore may be said to lack the required element of originality, even though the combination of ingredients contained in the recipes may be original in a noncopyright sense. In any event, copyright for a recipe clearly will not prevent others from creating culinary “dishes” based upon such a recipe, even if it could prevent the word for word production of the recipe.¹³⁸

Nimmer bases his doubt of the copyrightability of culinary recipes on the originality requirement because recipes merely combine ingredients, which are factual components.¹³⁹ By contrast, VR’s multisensory schemes are arguably neither factual nor inherently unoriginal. As discussed in Part I, it is possible to create an entirely fictional virtual environment with original multisensory effects, especially when VR is used as an artistic medium.

In addition, the Copyright Act provides some guidance as to which inner components of a work are important in considering copyright eligibility.¹⁴⁰ The Act defines its newest category of copyrightable subject matter, architectural works, as the following:

An “architectural work” is the design of a building as embodied in any tangible medium of expression, including a building, architectural plans, or drawings. The work includes the overall form

¹³⁵ *Id.*

¹³⁶ *Publ’ns Int’l Ltd. v. Meredith Corp.*, 88 F.3d at 480.

¹³⁷ *See, e.g.*, NIMMER ON COPYRIGHT, *supra* note 94, § 2.18(I).

¹³⁸ *Id.*

¹³⁹ *Id.*

¹⁴⁰ *See* 17 U.S.C. § 101 (2014).

as well as the arrangement and composition of spaces and elements in the design, but does not include individual standard features.¹⁴¹

Protectable elements of an architectural work can be analogized to a VR program and its virtual sensory scheme. A single sensory expression or element on its own can be likened to an “individual standard feature[.]” and therefore not copyright eligible.¹⁴² However, the Copyright Act’s definition of architectural works suggests that the “arrangement and composition” of spatial or design elements *comprising* an architectural work may fall under copyright protection; it distinguishes the “overall form” of an architectural work from its constituent design elements.¹⁴³ A distinct virtual sensory scheme can be thought of as a creative arrangement and compilation of sensory effects in which a series of ideas and pleasures is transmitted to the participant. The “overall form” comprises all the underlying creative components of a VR application, and each component should be treated as separable elements that warrant copyright protection.

When the Supreme Court considered the copyrightability of a photograph in *Burrow-Giles Lithographic Co. v. Sarony*,¹⁴⁴ it also distinguished the work’s medium from its potentially copyrightable components. In *Burrow-Giles*, plaintiff Sarony brought an action against defendant Burrow-Giles for making 85,000 copies of Sarony’s photograph, “Oscar Wilde, No. 18,” for sale.¹⁴⁵ Sarony claimed a copyright interest in the photograph, while the defendant argued that photographs fall outside the constitutional scope of copyright of a literal “writing.”¹⁴⁶ The Court rejected defendant’s arguments and found that the photograph was copyrightable.¹⁴⁷

Although the Court did not proclaim a *per se* copyright interest for any works in the photographic medium,¹⁴⁸ it explained why this particular photograph of Oscar Wilde warranted copyright interest:

The third finding of facts says, in regard to the photograph in question, that it is a “useful, new, harmonious, characteristic, and graceful picture, and that plaintiff made the same . . . entirely from his own original mental conception, to which he gave visible form by posing the said Oscar Wilde in front of the camera, selecting and arranging the costume, draperies, and other various accessories in

¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ *Burrow-Giles Lithographic Co. v. Sarony*, 111 U.S. 53 (1884).

¹⁴⁵ *Id.* at 54.

¹⁴⁶ *Id.* at 56.

¹⁴⁷ *Id.* at 55.

¹⁴⁸ *Id.* at 59.

said photograph, arranging the subject so as to present graceful outlines, arranging and disposing the light and shade, suggesting and evoking the desired expression, and from such disposition, arrangement, or representation, made entirely by plaintiff, he produced the picture in suit.¹⁴⁹

The Court effectively distinguished the question of the copyrightability of a medium as a whole from copyrightability arising out of a photographer's actual creative control exercised in the work.¹⁵⁰ In the end, what allowed copyright protection of the Wilde photograph were the original ways in which the photographer arranged and represented the various aesthetic components within a photograph, which the Court conceptually separated from the medium itself.¹⁵¹ Following the Court's reasoning, multisensory effects designs for virtual environments, if otherwise copyright eligible, should be evaluated for protection solely based on the aesthetic components, entirely separate from the VR medium. Even if future courts are not amenable to granting copyright protection to all VR programs, *Burrow-Giles* implies that the aesthetic components of a VR sensory scheme can be evaluated separately from its medium. It follows that, if otherwise copyright eligible, a sufficiently original multisensory effect design can be eligible for copyright, and on its own aesthetic merit.

C. Analyzing the Scope of Copyright Protection

The Copyright Act requires the basic inquiry for copyrightability to include an analysis of a work's originality, fixation, and authorship.¹⁵² However, a copyright should never be granted to ideas, but only to the expressions of such ideas.¹⁵³ In order to prove infringement, a plaintiff must show ownership of a valid copyright and the defendant's copying of constituent elements of the work that are original.¹⁵⁴ The second prong of the analysis involves a consideration of the defendant's access to the allegedly infringed work and substantial similarity between the plaintiff's and defendant's works.¹⁵⁵

For purposes of examining the scope of copyright protection of distinct sensory schemes within a designer-created VR work, cases that concern copyright protection in computer programs are a logical starting point. Computer programs have been given copyright protection since

¹⁴⁹ *Id.* at 60.

¹⁵⁰ *Id.*

¹⁵¹ *Id.*

¹⁵² 17 U.S.C. § 102(a) (2014).

¹⁵³ 17 U.S.C. § 102(b) (2014).

¹⁵⁴ NIMMER ON COPYRIGHT, *supra* note 94, § 13.01.

¹⁵⁵ *Id.*

the 1980s.¹⁵⁶ Congress enacted the Computer Software Copyright Act of 1980,¹⁵⁷ amending the Copyright Act of 1976 to include computer software. The amendment indicated Congress' clear general intent to grant copyright protection to computer programs.¹⁵⁸ Section 101 of the 1976 Act was amended to include the term "computer program," while certain exceptions to copyright protection for computer programs were included in Section 117.¹⁵⁹ Since then, case law has increasingly grappled with novel questions of copyrightability arising from rapidly evolving technology.¹⁶⁰

Computer software may be entitled to a "literary"¹⁶¹ copyright for its code and an "audiovisual"¹⁶² copyright pertaining to software visual displays. Similarly, it follows that virtual reality applications may be copyrighted as computer software for both literary and nonliterary (audiovisual) components.¹⁶³ However, the types of protection granted to VR works still need more refinement than currently exists under case law concerning software visual displays. Copyright protection of software visual displays, such as graphical user interfaces or the visual layout of a website, has been granted fairly broadly,¹⁶⁴ although some courts have expressed concern about an overly broad copyright and have attempted to limit its scope.¹⁶⁵

Courts frequently look to similarities in user interfaces in determining the "look and feel" or "total concept and feel."¹⁶⁶ The total concept and feel test first emerged in the Ninth Circuit in 1970 in a case in which the plaintiff alleged infringement of its greeting cards.¹⁶⁷ Since then it has been used by the courts in cases involving children's

¹⁵⁶ Act of Dec. 12, 1980, Pub. L. No. 96-517, § 10, 94 Stat. 3028 (1980) (codified as amended at 17 U.S.C. §§ 101, 117).

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ SCOTT ON INFORMATION TECHNOLOGY, § 2.05 (2011).

¹⁶⁰ See NIMMER ON COPYRIGHT, *supra* note 94, § 2.04(C).

¹⁶¹ 17 U.S.C. § 102(a)(1) (2014).

¹⁶² *Id.* § 102(a)(6).

¹⁶³ *Id.*

¹⁶⁴ See, e.g., *Whelan Assoc., Inc. v. Jaslow Dental Laboratory Inc.*, 797 F.2d 1222 (3d Cir. 1986) (extending the scope of copyright protection for computer programs by finding infringement based upon the defendant's copying of the structure, sequence and organization of plaintiff's software); *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F. Supp. 1127 (N.D. Cal. 1986) (granting a wide scope of copyright protection to the text and artwork of a software's audiovisual displays).

¹⁶⁵ See, e.g., *Digital Comm. Assocs. v. Softklone Distrib. Corp.*, 659 F. Supp. 449 (N.D. Ga. 1987) (asserting that plaintiff's copyright in software did not extend to the screen displays); *Apple Comp., Inc. v. Microsoft Corp.*, 799 F. Supp. 1006 (N.D. Cal. 1992) (holding that the "look and feel" of interface did not "constitute protectable expression apart from individual elements of interface").

¹⁶⁶ See, e.g., *Lotus Dev. Corp. v. Paperback Software Int'l*, 740 F. Supp. 37, 62 (D. Mass. 1990); Jack Russo & Jamie Nafziger, Symposium, *Software "Look and Feel" Protection in the 1990s*, 15 HASTINGS COMM. & ENT. L.J. 571 (1993).

¹⁶⁷ *Roth Greeting Cards v. United Card Co.*, 429 F.2d 1106 (9th Cir. 1970).

books,¹⁶⁸ imaginary worlds/television shows created for children,¹⁶⁹ video games,¹⁷⁰ and computer-generated audiovisual works.¹⁷¹ The look and feel and total concept tests showed that the courts would subject copyright claims to close examination. The Ninth Circuit later went on to formulate a two-part test for “total concept and feel.”¹⁷² In *Sid & Marty Krofft Tel. Prods. v. McDonald’s Corp.*, the court further identified an “extrinsic test” and an “intrinsic test” for total concept and feel.¹⁷³ An extrinsic test determines similarity in general ideas, and an intrinsic test compares the particular expression of those ideas.¹⁷⁴ As applied to VR technology, these tests may help to establish guidelines as to which components may be protectable.

The “look and feel” and “total concept and feel” rubrics are particularly helpful in considering copyright protection of VR sensory schemes. As in the case of software, a similarity in the “look” naturally comprises the purely visual components of virtual environments. The “feel” component, a broader term, may include VR’s various non-visual sensory indicia by definition: multisensory effects caused by a unique arrangement of audiovisual, haptic, olfactory, or tactile stimuli.¹⁷⁵ The Ninth Circuit has stated that the subjective assessment of the “concept and feel” of two works “involves the audience in an interactive process”¹⁷⁶ with the work in question and “calls on us ‘to transfer from our inward nature a human interest and a semblance of truth sufficient to procure for these shadows of imagination that willing suspension of disbelief for the moment, which constitutes poetic faith.’”¹⁷⁷

However, commentators, including Melville Nimmer, have expressed concerns about the courts’ use of the “total concept and feel” test.¹⁷⁸ The primary criticism is that “concepts” are statutorily ineligible for copyright protection, while the amorphous “feel” inquiry is not conducive to rational analysis.¹⁷⁹ Nonetheless, some courts—the Second

¹⁶⁸ *Reyher v. Children’s Tel. Workshop*, 533 F.2d 87 (2d Cir. 1976), *cert. denied*, 429 U.S. 980 (1976).

¹⁶⁹ *Sid & Marty Krofft Tel. Prods., Inc. v. McDonald’s Corp.*, 562 F.2d 1157 (9th Cir. 1977).

¹⁷⁰ *See, e.g., Atari, Inc. v. Amusement World, Inc.*, 547 F. Supp. 222 (D. Md. 1981); *Atari, Inc. v. North Am. Philips Consumer Elecs. Corp.*, 672 F.2d 607 (7th Cir. 1982), *cert. denied*, 459 U.S. 880 (1982).

¹⁷¹ *Broderbund Software v. Unison World, Inc.*, 648 F. Supp. 1127 (N.D. Cal. 1986).

¹⁷² *Sid & Marty Krofft Tel. Prods., Inc. v. McDonald’s Corp.*, 562 F.2d 1157 (9th Cir. 1977).

¹⁷³ *Id.* at 1164.

¹⁷⁴ *Id.*

¹⁷⁵ *Feel*, OXFORD ENG. DICTIONARY, <http://www.oed.com> (last visited Feb. 21, 2016) (“As a quality of a material object: The kind of (tactual or vague organic) sensation which it produces.”).

¹⁷⁶ *Shaw v. Lindheim*, 919 F.2d 1353, 1360 (9th Cir. 1990) (citing S.T. COLERIDGE, *BIOGRAPHIA LITERARIA*, reprinted in 5 *ENGLISH LITERATURE: THE ROMANTIC PERIOD* (A. Reed ed. 1929)).

¹⁷⁷ *Id.*

¹⁷⁸ NIMMER ON COPYRIGHT, *supra* note 94, § 13.03 (calling the invocation of the “total concept and feel” language “unfortunate.”).

¹⁷⁹ *Id.*

Circuit in particular—have defended the use of the “total concept and feel” rubric by asserting that the analysis carefully identifies “precisely the particular aesthetic decisions—original to the plaintiff and copied by the defendant.”¹⁸⁰

The subjective evaluation involved in the total concept and feel tests is a necessity in assessing the aesthetic appeal of works under scrutiny. In regard to VR programs, subjective evaluation would be not only crucial but perhaps the only means with which the aesthetic appeal of certain sensory effects could be evaluated. Multisensory effects in VR, by definition, are not amenable to rational analysis because they rely entirely on the sensory perception of a user. Therefore, the already existing total concept and feel test provides an appropriate route for determining the scope of copyright for eligible VR sensory effects.

III. TRADE DRESS

Trademark law owes its origin to the common law doctrine of unfair competition.¹⁸¹ For this reason, the overall aim of trademark law differs significantly from that of copyright law, which rewards creativity. Whereas copyright law protects expressions of an idea, trademark law protects robust commercial competition by safeguarding the overall image of a product as a type of identifying symbol of the source or sponsorship of goods or services.¹⁸² In effect, trademark law works to deter businesses from free riding on the quality reputation of a senior user of a similar mark.¹⁸³

Trade dress is a specific type of trademark. The Lanham Act¹⁸⁴—the federal trademark statute—defines a trademark as “any word, term, name, symbol, or device” that “is likely to cause confusion, or to cause mistake, or to deceive” as to the source of a product.¹⁸⁵ Subject matter scope is quite broad because the consumer can derive meaning from practically any symbol or device,¹⁸⁶ and it follows that consumer perception is critical in determining subject matter eligible as trade dress.¹⁸⁷ Indeed, the test for trade dress infringement is “whether there is

¹⁸⁰ *Tufenkian Imp./Exp. Ventures, Inc. v. Einstein Moomjy, Inc.*, 338 F.3d 127, 134 (2d Cir. 2003).

¹⁸¹ *Hanover Star Milling Co. v. Metcalf*, 240 U.S. 403, 413 (1916) (“[T]he common law of trademarks is but a part of the broader law of unfair competition.”).

¹⁸² J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION § 8:1 (4th ed. 2014) [hereinafter MCCARTHY ON TRADEMARKS].

¹⁸³ *Id.* at § 2:4.

¹⁸⁴ 15 U.S.C. § 1051 et seq. (2002).

¹⁸⁵ 15 U.S.C. § 1125(a) (2012).

¹⁸⁶ *See Abercrombie & Fitch Stores, Inc. v. American Eagle Outfitters, Inc.*, 280 F.3d 619, 630 (6th Cir. 2002) (“Because we can conceive of no ‘thing’ inherently incapable of carrying meaning, any ‘thing’ can come to distinguish goods in commerce and thus constitute a mark within the meaning of the Lanham Act.”).

¹⁸⁷ *Dreyfus Fund, Inc. v. Royal Bank of Can.*, 525 F. Supp. 1108, 1119–20 (S.D.N.Y. 1981)

a likelihood of confusion resulting from the impression created by the defendant's accused trade dress."¹⁸⁸

Accordingly, trade dress law is not structured to reward creators for producing particular content,¹⁸⁹ but instead its protection is limited to the meaningful *use* of a mark in a trade or business.¹⁹⁰ Thus in the VR context a typical defendant in a trade dress infringement suit would not be the designer of the confusingly similar multisensory effect, but rather the business that used the effect in a confusingly similar way so as to unfairly reap the benefits associated with another VR business's identity and reputation. Therefore, when a VR business brings a trade dress claim against a defendant, the plaintiff need not show that it is indeed the creator of the mark or the trade dress. Rather, the plaintiff only needs to show that the defendant inappropriately used the mark in a way that generates consumer confusion.¹⁹¹

The term "trade dress" was originally used to describe the appearance of labels, wrappers, and containers used in packing a product, but now often includes the overall appearance or image of goods and services.¹⁹² For instance, some courts have found that trade dress law may extend to protecting the "look and feel" of a website.¹⁹³ In order to warrant trade dress protection, however, the design must be distinctive and not functional.¹⁹⁴ If the trade dress is not inherently distinctive, it can be protected only if, as a result of use, it has acquired secondary meaning in the marketplace.¹⁹⁵

In *Two Pesos v. Taco Cabana*, the Supreme Court examined the question of whether the "look" of a Mexican food restaurant warranted trade dress protection under the Lanham Act.¹⁹⁶ Taco Cabana alleged that Two Pesos misappropriated its trade dress, which encompassed the overall mood or impression of the restaurant's decorative motif:

(noting that consumer perception controls over the actual intent of the senior user); MCCARTHY ON TRADEMARKS, *supra* note 182, § 24:19.

¹⁸⁸ MCCARTHY ON TRADEMARKS, *supra* note 182, § 8:15.

¹⁸⁹ *Am. Steel Foundries v. Robertson*, 269 U.S. 372, 380 (1926) ("There is no property in a trademark apart from the business or trade in connection with which it is employed.").

¹⁹⁰ *Prestonettes, Inc. v. Coty*, 264 U.S. 359, 368 (1924) ("A trade-mark only gives the right to prohibit the use of it so far as to protect the owner's good will against the sale of another's product as his.").

¹⁹¹ 15 U.S.C. § 1125(a) (2012).

¹⁹² RESTATEMENT (THIRD) OF UNFAIR COMPETITION § 16, cmt. a (1995).

¹⁹³ *See, e.g., Blue Nile, Inc. v. Ice.com, Inc.*, 478 F. Supp. 2d 1240 (W.D. Wash. 2007); *Sleep Sci. Partners v. Lieberman*, 2010 WL 1881770 (N.D. Cal. 2010); *Conference Archives v. Sound Images, Inc.*, 2010 WL 1626072 (W.D. Pa. 2010).

¹⁹⁴ RESTATEMENT (THIRD) OF UNFAIR COMPETITION, *supra* note 192.

¹⁹⁵ A design acquires secondary meaning when "prospective purchasers have come to perceive it as a designation that identifies goods, services, [or] businesses." *Id.* at § 13.

¹⁹⁶ *Two Pesos, Inc. v. Taco Cabana, Inc.*, 505 U.S. 763 (1992).

[A] festive eating atmosphere having interior dining and patio areas decorated with artifacts, bright colors, paintings and murals. The patio includes interior and exterior areas with the interior patio capable of being sealed off from the outside patio by overhead garage doors. The stepped exterior of the building is a festive and vivid color scheme using top border paint and neon stripes. Bright awnings and umbrellas continue the theme.¹⁹⁷

The Court concluded that the *overall impression* created by the listed elements was inherently distinctive and that Taco Cabana had a protectable trade dress.¹⁹⁸ Significantly, the Court held more generally that when trade dress is inherently distinctive, it does not have to acquire secondary meaning for protection under the Lanham Act.¹⁹⁹ As illustrated in *Two Pesos*, a trade dress analysis focuses on the totality of the elements enveloped in a trade dress.²⁰⁰ In light of this holding, trade dress law has since been used to protect user interfaces and website designs.²⁰¹

Given that trade dress encompasses the overall quality or impression of a product, it can be a suitable avenue for protecting VR sensory schemes, provided that the requirements under the Lanham Act are satisfied. The subject matter obstacle that VR sensory designs face in copyright law²⁰² is absent in that the distinction between the “high” and the “low” senses weakens in trademark law. The Supreme Court recognized the broadness of the scope of subject matter in trademark: “It is the source-distinguishing ability of a mark—not its ontological status as color, shape, fragrance, word, or sign—that permits it to serve these basic purposes.”²⁰³ In addition, the Tenth Circuit expressly acknowledged the protectability of a product’s tactile quality:

Trade dress is a complex composite of features. One may be size, another may be color or color combinations, another may be texture, another may be graphics and arrangement and so on. Trade dress is a term reflecting the overall general impact, usually visual, but sometimes also tactile, of all these features taken together.²⁰⁴

¹⁹⁷ *Taco Cabana Int’l, Inc. v. Two Pesos, Inc.*, 932 F.2d 1113, 1117 (5th Cir. 1991) *aff’d sub nom.* *Two Pesos, Inc. v. Taco Cabana, Inc.*, 505 U.S. 763 (1992).

¹⁹⁸ *Two Pesos*, 505 U.S. at 776.

¹⁹⁹ *Id.* at 775.

²⁰⁰ MCCARTHY ON TRADEMARKS, *supra* note 182, § 8:2.

²⁰¹ Liz Brown, *Bridging the Gap: Improving Intellectual Property Protection for the Look and Feel of Websites*, 3 NYU J. INTELL. PROP. & ENT. L. 310 (2014).

²⁰² *See supra* Part II.B.

²⁰³ *Qualitex Co. v. Jacobson Prods. Co., Inc.*, 514 U.S. 159, 164 (1995).

²⁰⁴ *Hartford House, Ltd. v. Hallmark Cards, Inc.*, 846 F.2d 1268, 1271 (10th Cir. 1988) (quoting *SK & F Co. v. Premo Pharmaceutical Labs. Inc.*, 481 F. Supp. 1184, 1187 (D.N.J. 1979), *aff’d*, 625 F.2d 1055 (3d Cir. 1980)).

This broad inclusion of elements comprising the “overall general impact” clearly does not confine itself to designs that only appeal to the eyes. So long as a “trade dress is tangible or otherwise objectively observable by the senses,” it may be trade dress eligible.²⁰⁵ Consequently, trademark protection is now allowed for numerous categories of designs that not only appeal to non-visual senses but also encompass a broad range of aesthetic impact, such as sounds, motion images, holographs, odors, and colors.²⁰⁶

A. *An Inherently Distinctive VR Sensory Scheme?*

Distinctiveness and nonfunctionality requirements are two important limitations on trade dress law’s scope of protection.²⁰⁷ Although section 43(a) of the Lanham Act does not explicitly require the trade dress to be distinctive, courts universally impose this requirement²⁰⁸ because it is necessary for the trade dress not to “cause confusion . . . as to the origin, sponsorship, or approval of [the] goods.”²⁰⁹ A trade dress can be inherently distinctive if its “intrinsic nature serves to identify a particular source”²¹⁰ or if it has developed secondary meaning, which occurs when, “in the minds of the public, the primary significance of a [mark] is to identify the source of the product rather than the product itself.”²¹¹

In a 2000 case, *Wal-Mart Stores v. Samara Bros.*, the Supreme Court limited *Two Pesos*’ reach by holding that product design trade dress can never be inherently distinctive and requires a showing of secondary meaning.²¹² Nevertheless, product packaging trade dress may still be inherently distinctive, such as the Tex-Mex restaurant décor in *Two Pesos*.²¹³

Categorizing potential trade dress as either product or package design is crucial. Ultimately, the distinction is a question of fact rather than an issue of law.²¹⁴ A product design is how a product looks and feels, while product packaging refers to the appearance of the package

²⁰⁵ *Abercrombie & Fitch Stores, Inc. v. American Eagle Outfitters, Inc.*, 280 F.3d 619, 631 (6th Cir. 2002).

²⁰⁶ See *supra* note 87; see also *Qualitex*, 514 U.S. at 159 (holding that trademark law may protect a single color); *In re Clarke*, 17 U.S.P.Q.2d 1238, 1239 (T.T.A.B. 1990) (trademark for fragrances); *In re Gen. Elec. Broad. Co.*, 199 U.S.P.Q. 560, 562–64 (T.T.A.B. 1978) (sound trademark).

²⁰⁷ 15 U.S.C. §§ 1125(a)(3), 1125(c)(2)(B) (2012); RESTATEMENT (THIRD) OF UNFAIR COMPETITION, *supra* note 192, § 13.

²⁰⁸ *Wal-Mart Stores, Inc. v. Samara Bros., Inc.*, 529 U.S. 205, 210 (2000).

²⁰⁹ *Id.* (quoting 15 U.S.C. § 1125(a)).

²¹⁰ *Two Pesos, Inc. v. Taco Cabana, Inc.*, 505 U.S. 763, 768 (1992).

²¹¹ *Inwood Labs., Inc. v. Ives Labs., Inc.*, 456 U.S. 844, 851 n.11 (1982).

²¹² *Wal-Mart Stores, Inc. v. Samara Bros., Inc.*, 529 U.S. 205, 216 (2000).

²¹³ *Id.* at 215.

²¹⁴ MCCARTHY ON TRADEMARKS, *supra* note 182, § 8:12.50.

in which a product comes.²¹⁵ Examples of trade dress that courts have categorized as product packaging—as opposed to product design—include the décor of a retail wine shop,²¹⁶ and the interior and exterior design of a restaurant, menu, and server attire.²¹⁷ However, courts have held that if a design seeking trade dress protection is an integral part of the design of the product and “is physically and functionally inseparable from the whole,” then the design must be categorized as product design, requiring a showing of secondary meaning.²¹⁸

Undoubtedly, whether a VR sensory scheme will be categorized as product design or packaging will have profound implications in its trade dress eligibility. This is especially true in the VR context because secondary meaning, which “must evolve over time,” is more difficult to demonstrate in a fledgling product than inherent distinctiveness.²¹⁹ Although the sensory impression left by a VR program is arguably the product itself, it can be analogized to the interior decorative motifs of retail stores, which courts already categorize as product packaging.²²⁰ Similar to the décor of the Mexican restaurant chain in *Two Pesos*, the overall “look and feel” of an original virtual environment can be conceived as a protectable consumer impression, created by individual elements of sensory stimuli. In addition, it is possible to separate the sensory scheme from the overall “product”—the VR program—and treat it as a kind of packaging.

Assuming that a VR sensory design is successfully categorized as product packaging, the next hurdle would be to show that the design is inherently distinctive. Courts often apply the *Seabrook* test of inherent distinctiveness.²²¹ In *Seabrook Foods v. Bar-Well Foods*,²²² the Court of Customs and Patent Appeals laid out the three-factor test for inherent distinctiveness:

whether [the design or shape] was a “common” basic shape or design, whether it was unique or unusual in a particular field, [and] whether it was a mere refinement of a commonly-adopted and well-known form of ornamentation for a particular class of goods viewed by the public as a dress or ornamentation for the goods.²²³

The aforementioned factors suggest that the level of originality of

²¹⁵ RESTATEMENT (THIRD) OF UNFAIR COMPETITION, *supra* note 192, § 16, cmt. a.

²¹⁶ *Best Cellars, Inc. v. Wine Made Simple, Inc.*, 320 F. Supp. 2d 60, 70 (S.D.N.Y. 2003).

²¹⁷ *Miller’s Ale House, Inc. v. Boynton Carolina Ale House, LLC*, 702 F.3d 1312, 1323–24 (11th Cir. 2012).

²¹⁸ *Cont’l Lab. Prod., Inc. v. Medax Int’l, Inc.*, 114 F. Supp. 2d 992, 999 (S.D. Cal. 2000).

²¹⁹ *Brown*, *supra* note 201, at 334.

²²⁰ *See supra* notes 216–217.

²²¹ *See, e.g., In re Chippendales USA, Inc.*, 622 F.3d 1346, 1357 (Fed. Cir. 2010).

²²² *Seabrook Foods, Inc. v. Bar-Well Foods Ltd.*, 568 F.2d 1342, 1344 (C.C.P.A. 1977).

²²³ *Id.*

the designed virtual environment would play a large role in the *Seabrook* test's outcome. For instance, if a VR program seeking trade dress protection is a mere virtual rendition of an existing place in the world, its level of uniqueness or source-indicating power would be low. By contrast, if a designer creates a brand new world from her imagination with a novel way of navigating within the VR, as Davies did with her *Osmose* project,²²⁴ it would have a higher chance of passing the *Seabrook* test of inherent indistinctiveness.

B. *Functionality*

Perhaps the greatest doctrinal challenge to extending trade dress protection to the look and feel of a VR application is functionality. The requirement of nonfunctionality serves a similar purpose as that of the idea-expression dichotomy in copyright law in that it carves out a zone of features that may be freely used and copied by anyone.²²⁵ Specifically, the nonfunctionality requirement preserves free and effective competition by ensuring that competitors can copy necessary features while limiting IP protection of utilitarian features to the realm of utility patent law.²²⁶ Thus, a design must be nonfunctional even if it is inherently distinctive in order to be protected under the Lanham Act.²²⁷ The functionality doctrine in trade dress law is comprised of two parts: utilitarian functionality and aesthetic functionality.²²⁸

Courts have struggled to articulate a unified definition of functionality.²²⁹ The Supreme Court has said that a trade dress is functional in the utilitarian sense if the feature or features claimed within the trade dress are as a whole “essential to the use or purpose of the article or if it affects the cost or quality of the article.”²³⁰ Whether the design features are functional depends on the factual circumstances of each VR program seeking trade dress protection because, as with the distinctiveness requirement, functionality is an issue of fact.²³¹ However, it is difficult to imagine a scenario in which a particular sensory scheme portraying a specific virtual environment would be deemed essential to the use of the VR program, unless the objective of the program requires a realistic rendition of an existing place. For

²²⁴ See *supra* Part I.

²²⁵ *Qualitex Co. v. Jacobson Prods. Co., Inc.*, 514 U.S. 159, 164 (1995) (“The functionality doctrine prevents trademark law, which seeks to promote competition by protecting a firm’s reputation, from instead inhibiting legitimate competition by allowing a producer to control a useful product feature.”).

²²⁶ MCCARTHY ON TRADEMARKS, *supra* note 182, §§ 7:63, 7:68.

²²⁷ 15 U.S.C. 1125(a)(3) (2012).

²²⁸ MCCARTHY ON TRADEMARKS, *supra* note 182, §§ 7:69, 7:79.

²²⁹ MCCARTHY ON TRADEMARKS, *supra* note 182, § 7:69.

²³⁰ *Qualitex Co. v. Jacobson Prods. Co., Inc.*, 514 U.S. 159, 164 (1995) (quoting *Inwood Labs., Inc. v. Ives Labs., Inc.*, 456 U.S. 855, 850 n.10 (1982)).

²³¹ MCCARTHY ON TRADEMARKS, *supra* note 182, § 7:71.

instance, competing VR tourism applications that virtually transport a user to an actual beach in Maui may inevitably share some sensory features in representing that particular beach.²³²

On the other hand, aesthetic functionality poses a greater challenge to gaining trade dress protection for distinct VR sensory schemes. Aesthetic functionality bars trade dress protection when an important design ingredient “satisfies a demand for the aesthetic as well as for the utilitarian.”²³³ Examples of design features that courts have found to be aesthetically functional include a baroque-style decoration of silverware,²³⁴ a basket design on hotel china,²³⁵ and gilded edges of a line of cookbooks.²³⁶ Testing this amorphous criteria can lead to inconsistency or confusion,²³⁷ and some courts have rejected the theory of aesthetic functionality altogether.²³⁸ Nonetheless, the Restatement (Third) of Unfair Competition adopted a useful formulation, which the Supreme Court quoted with approval: “A design is functional because of its aesthetic value only if it confers a significant benefit that cannot practically be duplicated by the use of alternative designs.”²³⁹

As discussed in Part I.B, VR applications operate within numerous technological constraints in order to achieve the desired aesthetic and immersive qualities. That is, some aesthetic choices in designing an immersive VR are inevitably tied to functional considerations in creating a VR that mimics the sensory stimuli of the real world. Accordingly, a “significant benefit”²⁴⁰ that a particular sensory design confers to one VR application sometimes needs to be duplicated in another application to acquire the level of immersion and realism that a consumer expects from VR applications. This is especially true in cases in which the sole objective of a VR application is to transport the user to a common, existing place—such as a beach or any popular tourist attraction. VR gaming is another area in which some sensory representation may overlap, the elements of which, if granted exclusivity, may hamper fair competition.²⁴¹ One way to avoid the

²³² Peter Rubin, *The Future of Travel Has Arrived: Virtual-Reality Beach Vacations*, WIRED (Sept. 18, 2014, 6:30 AM), <http://www.wired.com/2014/09/marriott-vr-teleporter/>.

²³³ *Pagliero v. Wallace China Co.*, 198 F.2d 339, 343 (9th Cir. 1952).

²³⁴ *Wallace Int'l, Silversmiths, Inc. v. Godinger Silver Art Co., Inc.*, 916 F.2d 76 (2d Cir. 1990).

²³⁵ *Villeroy & Boch Keramische Werke K.G. v. THC Sys., Inc.*, 999 F.2d 619 (2d Cir. 1993).

²³⁶ *Publ'ns Int'l, Ltd. v. Landoll, Inc.*, 164 F.3d 337 (7th Cir. 1998) (“Gold is a natural color to use on a fancy cookbook.”).

²³⁷ MCCARTHY ON TRADEMARKS, *supra* note 182, § 7:80.

²³⁸ See, e.g., *Devan Designs, Inc. v. Palliser Furniture Corp.*, 25 U.S.P.Q.2d 1991, 2002 (M.D.N.C. 1992), *aff'd*, 27 U.S.P.Q.2d 1399 (4th Cir. 1993) (“[T]his court has no reason to think that the Fourth Circuit would be inclined to adopt such a policy [of aesthetic functionality].”).

²³⁹ *Qualitex Co. v. Jacobson Prods. Co., Inc.*, 514 U.S. 159, 170 (1995); RESTATEMENT (THIRD) OF UNFAIR COMPETITION, *supra* note 192, at § 17 cmt. c.

²⁴⁰ *Id.*

²⁴¹ Because game designers contemplate human psychology, anthropology, and design in order to “create games that will somehow generate wonderful, compelling, memorable experiences,” there

aesthetic functionality obstacle is to create a VR application that portrays a world that is inherently original, fantastical, or one that employs a novel means of navigating or interacting with the virtual environment.

C. Identifying Trade Dress Elements

One practical challenge in protecting a distinct and nonfunctional VR sensory scheme as trade dress stems from the fact that the individual elements that comprise trade dress must be clearly identified and described.²⁴² Articulation of specific elements becomes especially important when a trade dress is challenged in litigation.²⁴³ Trade dress infringement suits require not only a careful listing of individual trade dress elements but also a description of how the elements combine to create the product's protectable "look and feel."²⁴⁴ Precision in describing a trade dress ensures fairness to the party accused of infringement by defining the exact dimensions of the trade dress over which the plaintiff claims exclusivity.²⁴⁵

Compared to traditional logo or word marks, identifying the elements of a VR multisensory scheme poses a much greater challenge. There is inherent difficulty in translating sensorial impression into words with sufficient precision. Website owners seeking trade dress protection of the websites' look and feel already struggle with the exactitude with which the elements must be described.²⁴⁶ With the addition of multisensory elements comprising the overall impression in a VR program, it would require tremendous care and verbal competence to describe precisely the individual elements comprising complex tactile, olfactory, or gustatory effects. Therefore, multisensory effects seeking trade dress protection must be able to distinguish themselves not only in the actual sensorial impression they leave upon consumers

is some, inevitable overlap in successful design elements. JESSE SCHELL, *THE ART OF GAME DESIGN: A BOOK OF LENSES* 12–13 (2d ed. 2014).

²⁴² See, e.g., *Yurman Design, Inc. v. PAJ, Inc.*, 262 F.3d 101, 116–17 (2d Cir. 2001) (“[W]e hold that a plaintiff seeking to protect its trade dress in a line of products must articulate the design elements that compose the trade dress And if a court is unable to identify what types of designs will infringe a trade dress, how is a competitor in the jewelry business to know what *new* designs would be subject to challenge by Yurman?”); *Sleep Science Partners v. Lieberman*, No. 09–04200 CW, 2010 WL 1881770, at *3 (N.D. Cal. 2010) (“Without an adequate definition of the elements comprising the website’s ‘look and feel’ [defendant] is not given adequate notice.”).

²⁴³ *Landscape Forms, Inc. v. Columbia Cascade Co.*, 113 F.3d 373, 381 (2d Cir. 1997) (“[A] plaintiff’s inability to explain to a court exactly which aspects of its product design(s) merit protection may indicate that its claim is pitched at an improper level of generality, i.e., the claimant seeks protection for an unprotectable style, theme or idea.”).

²⁴⁴ *Salt Optics, Inc. v. Jand, Inc.*, No. SACV 10-0828 DOC (RNBx), 2010 WL 4961702, at *5 (C.D. Cal. 2010); *Abercrombie & Fitch Stores, Inc. v. American Eagle Outfitters, Inc.*, 280 F.3d 619, 635 (6th Cir. 2002) (A plaintiff is “expected to list the elements of the designs and the unique combinations it [seeks] to protect”).

²⁴⁵ MCCARTHY ON TRADEMARKS, *supra* note 182, § 8:3.

²⁴⁶ See, e.g., *Sleep Science Partners*, 2010 WL 1881770.

but also in the manner in which they can be verbally articulated.

CONCLUSION

Courts will soon face the question of whether sensory effect designs for immersive virtual environments are eligible for copyright or trade dress protection. Widespread adoption of VR technology will inevitably change the way people communicate, entertain, create, and even think about their immediate real life experiences. VR technology ultimately depends on continuous creation of novel content, and IP protection of such original content will be indispensable. Copyright and trade dress laws, though they overlap in some aspects of possible protection, currently fall short of protecting the full value of original and creative multisensory effect schemes in VR.

In order to better accommodate this emerging mainstream technology, copyright law should grant uniform protection to works that evoke all five human senses and reevaluate the constitutional and statutory grounds for copyrightable subject matter. To the extent that sensory effects are conceptualized as a compilation of aesthetic, sensory components, copyright law may be sufficiently responsive to safeguarding creative sensory expressions created by a VR designer. On the other hand, trade dress law not only imposes difficult challenges in identifying and describing VR trade dress elements but also limits its protection to the user of the VR effects—i.e., the VR business—rather than the designer who created the trade dress eligible sensory effects. However, as more VR applications gain popularity and mass consumption increases, trade dress law may become the proper sanctuary for distinctive and impressive sensory schemes.

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