EXHIBIT
2027

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

REVVO TECHNOLOGIES, INC.

Petitioner,

v.

TIRE STICKERS LLC.

Patent Owner.

IPR2025-00631

Patent 11,124,027

DECLARATION OF MARK MINEUR

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I, Mark Mineur, do hereby declare under penalty of perjury under the laws of the United States of America that the following is true and correct, and that all statements made on information and belief are believed to be true. I understand that willful false statements are punishable by fine or imprisonment or both. *See* 18 U.S.C. § 1001.

I. Introduction

1. I have been retained by Tire Stickers, LLC ("Patent Owner" or "Tire Stickers") in connection with Revvo's Petition for inter partes review ("IPR") of claims 1-3, 5, 7-9, 11-13, and 15-22 ("Challenged Claims") of U.S. Patent No. 11,124,027 B2 ("'027 patent") titled "Display Assemblies and Methods for Applying the Same to Vulcanized Rubber Articles."

2. I have been asked to review and respond to the opinions of Mr. Donley in this matter, and to provide my expert opinion regarding whether the Challenged Claims of the '027 patent are patentable over the prior art identified in the Petition. I have been asked to assume the priority date of the alleged invention of the '027 patent is Apr. 27, 2015. I understand that this Declaration will be used in support of Tire Sticker's response to Revvo's IPR Petition.

3. I am compensated $400/hour for my time spent working in connection with this matter. All of my opinions are my own and my compensation in this matter is not influenced or contingent upon my opinions formulated in this matter. I am not

employed by nor do I hold stock or an interest in Tire Stickers, LLC.

II. Summary of Opinions

4. As explained below, it is my opinion that Petitioner and Petitioner's expert have not shown that a Person of Ordinary Skill in the Art (POSITA) at the time of the invention of the '027 Patent would have found any of the challenged claims as obvious.

III. Qualifications and Background

5. I am over eighteen years of age and fully competent to testify. A copy of my current Curriculum Vitae is attached as Exhibit 2028. The following summarizes my background and qualifications. In my opinion, and based on my review of the record, my experience not only meets but substantially exceeds the level of ordinary skill in the art applicable to the '027 Patent, and also meets or exceeds the experience of Petitioner's expert, Mr. Donley, particularly in the areas directly relevant to this proceeding.

6. I have over forty years of hands-on, technical, and leadership experience in the global tire industry, including extensive work with vulcanized rubber products, tire construction, tire patches and tire-mounted assemblies, adhesive and bonding systems, material migration mechanisms, and the integration of functional elements such as RFID devices and electronics into tire components and auxiliary assemblies. I have personally led and executed design, development,

manufacturing, and testing programs for the precise types of structures at issue in the ’027 Patent: multi-layer elastomeric assemblies, shock-absorbing layers, barrier compositions, adhesive bonding to vulcanized rubber, and assemblies required to survive the extreme flexure and chemical environment of in-service tires.

7. I am the President of Mark X Corp, an engineering consultancy I have operated since 2010. Through Mark X Corp, I provide expert technical guidance to major tire manufacturers, automotive suppliers, global trading organizations, and raw-material suppliers throughout North America, Europe, and Asia. This work includes designing tire constructions, specifying elastomeric materials, developing and evaluating bonding systems for vulcanized rubber, advising on adherence and migration issues, and implementing production-ready solutions that must withstand the exact mechanical, thermal, and chemical environments described in the ’027 Patent. These activities give me direct, practical experience with the types of assemblies, materials, and engineering constraints that a person of ordinary skill in the art would consider when evaluating the features claimed in the ’027 Patent.

8. I have been qualified and admitted without exception as an expert witness in multiple federal matters, including courts in the Eastern District of Virginia and the Northern District of Ohio. In those cases, I have been formally

accepted as a Subject Matter Expert on:

- tire design and engineering,
- vulcanized rubber assemblies,
- product development for tire technologies,
- off-the-road (OTR) and mining tires, and
- intellectual property relating to tire structures and performance.

9. I have authored multiple expert reports, provided deposition testimony, and testified at trial. My federal-court qualifications include being accepted as an expert in areas that directly overlap with the subject matter of the ’027 Patent—an important distinction, as Petitioner’s expert has not served in comparable roles, nor demonstrated equivalent depth of experience in tire-layered assembly engineering or in the field application of barrier and adhesive systems for vulcanized rubber.

10. Before founding my consultancy, I spent over three decades at The Goodyear Tire & Rubber Company, one of the world’s largest tire manufacturers. Throughout my career at Goodyear, I held senior technical and executive leadership roles that required skills in the design, modeling, compounding, testing, and manufacturing of a wide range of tire constructions. These positions included:

- Manager, Global Product Performance Excellence
- Senior Global Account Executive, OTR Tires
- Chief Engineer, Off-the-Road Tire Development
- Chief Engineer, Customer Engineering

- Chief Engineer, Passenger Tire Development (Luxembourg)
- OEM Automotive Engineering Account Manager

In these roles, I oversaw:

- global tire design and development programs across multiple continents.
- the creation of new elastomeric layer structures and bonding systems.
- modeling and simulation of tire flexure, casing fatigue, and rubber strain behavior.
- adhesive performance and migration issues.
- design standards for multilayer elastomeric assemblies.
- factory-scale implementation and certification of tire constructions for international markets.
- and programs involving the integration of embedded electronics—including RFID—into tire and tire-adjacent structures.

11. In short, I have personally engineered and validated the precise categories of materials, structures, and performance characteristics that the ’027 Patent addresses. This includes understanding how barrier materials must be formulated to prevent chemical migration, how multi-layer constructions must balance shock absorbance and flexural strain, and how adhesive bonds to vulcanized rubber behave under real-world loading. These are not academic concepts for me—they are areas in which I have decades of practical responsibility and proven results across numerous global production facilities.

12. I hold an M.S. in Mechanical Engineering from the University of Akron and a B.S. in Mechanical Engineering from Rensselaer Polytechnic Institute, along with executive training at the University of Virginia’s Darden School of Business and advanced coursework in vehicle and tire dynamics under Dr. Hans Pacejka. I

am multilingual, have worked on six continents, and am the named inventor on multiple U.S. and foreign patents.

13. Based on my education, extensive technical experience, and decades of direct involvement in the exact technologies and materials relevant to the ’027 Patent, I am fully qualified to offer expert opinions in this matter. In my view, my expertise aligns more closely with the real-world demands of designing multi-layer elastomeric assemblies for vulcanized rubber articles and provides a technical foundation that exceeds what a POSITA would have possessed at the time of the alleged invention.

IV. Understanding of Patent Law

14. I am not an attorney, and I am not providing any expert opinions on the law. I have, however, been advised of certain basic legal principles applicable to my analysis in this report, and I have applied those principles in forming my opinions. Those principles follow.

A. General Patent Law

15. It is my understanding that assessing the validity of a U.S. patent based on a prior art analysis requires two essential steps. First, one must construe the terms of the patent claims to understand what meaning one of ordinary skill in the art would give the terms. Second, after the claim terms have been construed, one may then assess validity by comparing a patent claim to the “prior art.” I understand that the

teaching of the prior art is viewed through the eyes of a POSITA at the time the invention was made. My opinion as to what constitutes a relevant person of ordinary skill in the art is set forth below. For purposes of my independent analysis, I have assumed that all of the references cited by the Petition in this IPR proceeding to be prior art.

B. Level of Ordinary Skill in the Art

16. I understand that patent law has a concept of "person of ordinary skill in the art" ("POSITA"). I further understand that this concept refers to a hypothetical person who is assumed to be trained or has had professional work experience in the relevant field of a patent. Factors that may be considered in determining the level of ordinary skill in the art include: the educational level of the inventor, the sophistication of the technology, the types of problems encountered in the art, prior art solutions to those problems, rapidity with which innovations are made, and educational level of active workers in the field. I also understand that the level of skill of the person of ordinary skill in the art should be assessed at the time of the claimed invention.

17. My opinions herein are based on the same level of ordinary skill that Mr. Donley applied, which I understand that he contends was: "at least an undergraduate degree in chemistry, polymers, materials science, chemical engineering (or equivalent degree) and one to two years of experience with

constructing and manufacturing tires, tire patches, tire decals/stickers and/or the like. This definition is approximate, and more experience may substitute for education or vice versa." For purposes of this analysis, I have not disputed Mr. Donley's proposed level of skill.

C. Claim Interpretation

18. I understand that, in an *inter partes* review, claim language is generally given its ordinary and customary meaning in light of the entire disclosure as read by a POSITA at the time of the invention.

19. I further understand that a term will not receive its ordinary and customary meaning if the patentee acted as his or her own lexicographer and set forth a definition of a disputed term in either the specification or during prosecution. In addition, I understand that a patentee may disclaim/disavow a portion of the scope of a term whose ordinary meaning would other be broader.

20. I also understand that, in determining the ordinary and customary meaning of a term, the first place a person should look to is the claim itself and its usage in context with other claim terms. The person should also consider the written description, drawings, and prosecution history, all of which are known as "intrinsic evidence." I understand that claim terms cannot be construed in a way that is divorced from the intrinsic evidence and the specification is considered to be the

single best guide to the meaning of a disputed term.

D. Anticipation

21. I understand that a claim is invalid if it is anticipated or obvious.

22. I understand that under 35 U.S.C. § 102 in *inter partes* reviews, a claim is anticipated if all limitations of that claim are disclosed in a single previously printed publication or patent and the disclosed limitations are arranged and combined in the same way as recited in the claim.

23. I also understand that in inter partes reviews anticipation must be shown by the preponderance of the evidence.

1. Obviousness

24. I understand that the Petition contends that the challenged claims are invalid as "obvious." My understanding is that a patent claim is invalid as obvious only if the subject matter "as a whole" of the claimed invention would have been obvious to a POSITA in the relevant field at the time the invention was made. In determining the differences between a prior art reference (or a proposed combination of prior art references) and the claims, the question of obviousness is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. Also, obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated

reasoning with rational underpinning to support the legal conclusion of obviousness.

25. I also understand that claims made in US Patent Applications are reviewed and scrutinized by the USPTO Examiner for potential grounds of obviousness based on prior art reviewed and concludes that a POSITA would not find the claims obvious at the time the patent application was reviewed and US Patent issued.

26. I understand that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art. In evaluating whether any claim of the ’027 patent would have been obvious, I considered whether the Petition, the Declaration of Mr. Donley, or any other evidence submitted in this proceeding presented an articulated reason with a rational basis that would have prompted a POSITA to combine the elements or concepts from the prior art in the same way as in the claimed invention.

27. It is my understanding that the decision-maker may consider whether the change was merely the predictable result of using prior art elements according to their known functions, or whether it was the result of true inventiveness. And, the decision-maker may also consider whether there is some teaching or suggestion in the prior art to make the modification or combination of elements recited in the claim at issue. Also, the decision-maker may consider whether the innovation applies a known technique that had been used to improve a similar device or method in a

similar way. The decision-maker may also consider whether the claimed invention would have been obvious to try, meaning that the claimed innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those skilled in the art.

28. I have been instructed by counsel that if any of these considerations are relied upon to reach a conclusion of obviousness, the law requires that the analysis of such a relied-upon consideration must be made explicit. I understand that the decision-maker must be careful not to determine obviousness using the benefit of hindsight and that many true inventions might seem obvious after the fact. I understand that the decision-maker should consider obviousness from the position of a person of ordinary skill in the relevant field at the time the claimed invention was made and that the decision-maker should not consider what is known today or what is learned from the teaching of the patent.

29. I understand that in order to determine whether a patent claim is obvious, one must make certain factual findings regarding the claimed invention and the prior art. Specifically, I understand that the following factors must be evaluated to determine whether a claim is obvious: (1) the scope and content of the prior art; (2) the difference or differences, if any, between the claim of the patent and the prior art; (3) the level of ordinary skill in the art at the time the claimed invention was made; and (4) the objective indicia of non-obviousness (if available), also known as

"secondary considerations."

30. I understand that the secondary considerations include:

- commercial success of a product due to the merits of the claimed invention;
- a long felt need for the solution provided by the claimed invention;
- unsuccessful attempts by others to find the solution provided by the claimed invention;
- copying of the claimed invention by others;
- unexpected and superior results from the claimed invention;
- acceptance by others of the claimed invention as shown by praise from others in the field or from the licensing of the claimed invention;
- teaching away from the conventional wisdom in the art at the time of the invention;
- independent invention of the claimed invention by others before or at about the same time as the named inventor thought of it; and
- other evidence tending to show obviousness.

31. It is my understanding that, in order to establish a secondary consideration, it is required that the evidence demonstrate a clear nexus between that

secondary consideration and the claimed invention.

V. Background of the Technology

32. Traditional tire patch technology was developed primarily for installation on the inner liner of the tread in pneumatic tires or on an inner tube used in tube type tires. This location leveraged three inherent advantages of the interior environment: internal air pressure, environmental protection, and the inherent rigidity of the tire tread. When a tire is inflated, the pressure within the cavity presses the patch uniformly against the inner liner or the inner tube in a tube type tire, effectively providing a continuous clamping force that reinforces adhesive contact and reduces edge peel. The inner cavity also shields the patch and its adhesive interface from the exterior environmental impacts of water, road salts, hydrocarbons, ultraviolet radiation, debris, such as and direct abrasion, thereby stabilizing the bond over time and reducing degradation from factors that are prevalent on the exterior of the tire. Moreover, the inner liner of the tread or the surface of an inner tube is an optimal choice for adhesion as the tire tread is reinforced with steel belts making it very rigid and allowing patches to easily attach and remain attached due to lower flexing in the tire tread section of the tire, or a patch on the surface of the inner tube used in a tube type tire is pressed and pinned between the tube and the interior of the tube type tire.

33. Many traditional patches employed reinforced fabrics, thicker cushion

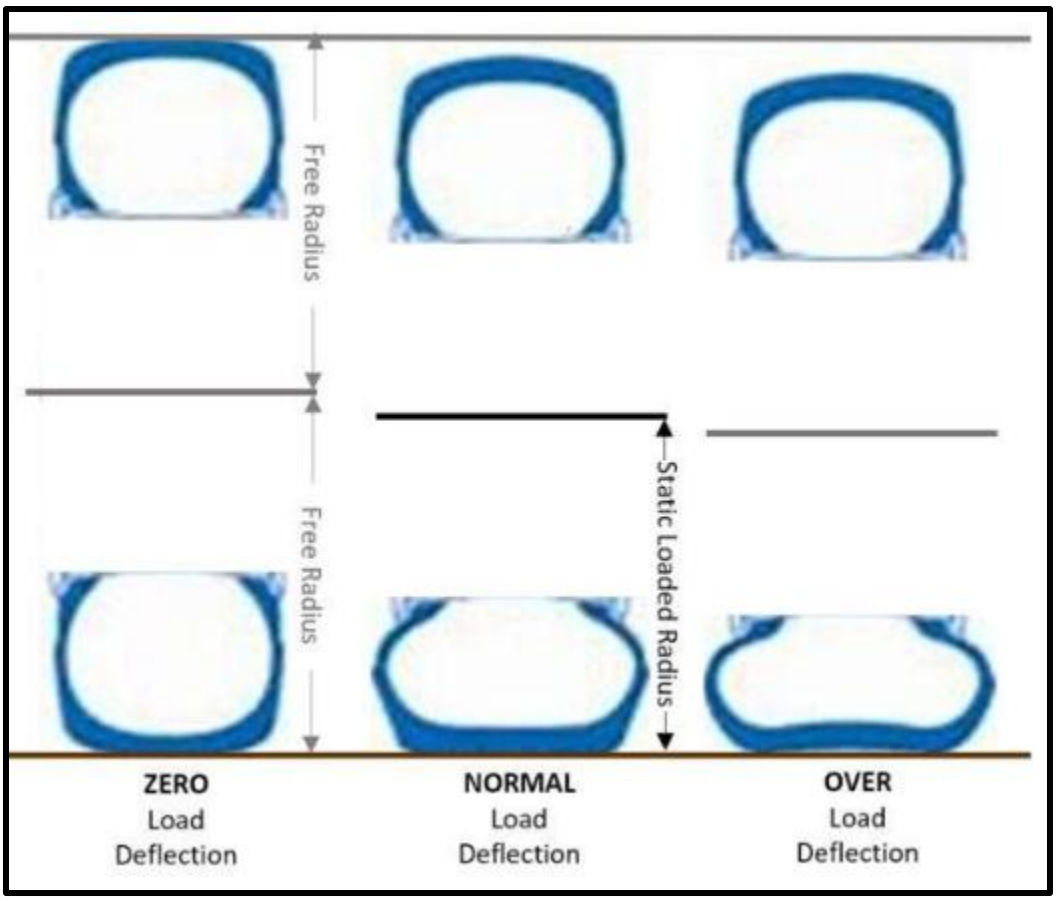
gum layers, and stiffer or semi-rigid backings, which could be compatible with lower-flex regions of the tire, particularly near the tread. The tread area by design possesses comparatively higher bending stiffness both circumferentially and radially and experiences less extreme flex than the other areas of the tire such as the sidewall, so a patch can distribute loads more uniformly and maintain dimensional stability without inducing excessive deformation at the bonding interface.

34. Structural Rigidity as is typically found in the tread area of a pneumatic tire also helps resist deformation-induced peel forces at the edges. In such configurations, the structural and environmental characteristics of the inner liner and tread-adjacent regions assisted the long-term retention of a patch and supported its mechanical performance.

35. By contrast, the conventional art was not designed to perform reliably when its attachment location on the tire was varied from the tread section in a tubeless tire. Nor was the conventional art designed to hold elements within it, like RFID chips, or to carry designs and indicia that may be damaged by the harmful potentially reactive chemicals known to migrate from within the tire, the bonding chemicals and the patch itself.

36. For example, high-flex regions of a pneumatic tire such as the interior surface of the sidewall or exterior mounting scenarios put traditional patch technology at risk of failure. The sidewall experiences substantial cyclic flexural

strains, radial deformation, and localized bending as the tire deflects at the contact patch. In other words, the sidewall is going to bend, flex and bow when the tire is put under loads (e.g., the vehicle is hauling a lot of weight or towing), or the tire is experiencing higher or lower pressure (e.g., the tire is at max or minimum inflation). In these scenarios, one can visually experience the deflection that occurs in the sidewall of one's tire, whereas the tire tread remains mostly uniform with minimal deflection and deformation.



Ex. 2029 (https://agtiretalk.com/optimum-tire-deflection-best-yield/) (generally describing the effects of deflection on sidewalls in the Ag Tire context, which a

POSITA would have understood to be similar to the effects on a road tire except slightly less pronounced due to differences in size and load).

37. Traditional patch architectures, tuned for the inner-liner environment, are susceptible to edge peel and interfacial shear failure under these deformation modes. In addition, these designs lacked barrier material layers engineered both to provide environmental sealing against moisture, chemicals, UV, and abrasion, and to manage strain through compliant interlayers, mitigate flex-fatigue and allow for flexibility consistent with the deformation that can and does occur in vulcanized rubber articles. Without these features and functionality, patches were prone to premature debonding and material degradation when exposed to harsh exterior conditions and high-flex locations.

38. The stiffness of conventional patch bodies when applied to tire areas with higher deformity likelihood, would lead to a mismatch between patch rigidity and substrate compliance thereby increasing peel forces and undermining of bond reliability.

39. Furthermore, a POSITA in this art has long been aware of and motivated to minimize the size and weight of tire patches in order to maintain the weight and balance of tires. EX2030 (https://www.fleetequipmentmag.com/truck-tire-balance-fuel-economy/) ("Historically, the goal has been to use balancing to prevent or solve complaints of [vehicle] ride, vibration and even wheel hop. …

balancing all wheel positions on over-the-road [vehicles] can save up to 2.2% fuel compared to non-balanced assemblies.”). Any added weight increases centrifugal forces at speed and can exacerbate local shear and peel stresses at the adhesive interface. Furthermore, larger geometries placed on one side of a tire without balancing that weight on opposite sides of the tire may lead to many unwanted vibrations or stress concentrations. Minimizing the mass and profile of the patch and its housing improves conformity, reduces balance mismatch, and limits the degree to which the patch upsets the dynamics of a tire as it rotates.

40. This focus on compactness and lightness is closely tied to preserving tire balance, which is the even distribution of mass about the tire/wheel assembly’s axis of rotation. In other words, a balanced assembly is one in which the center of mass is located on the axis of rotation. Proper balance requires alignment of the assembly’s center of mass with its rotational axis to avoid static imbalance (a heavy spot causing vertical hop) and dynamic imbalance (unequal mass distribution across 2 parallel planes causing lateral wobble and complex vibration modes).

41. Imbalance degrades safety and handling by introducing vibrations that impair traction, braking, and steering precision, accelerates irregular tread wear and component fatigue, and diminishes ride quality through increased noise, vibration, and harshness. EX2030 (https://www.fleetequipmentmag.com/truck-tire-balance-fuel-economy/). Even small, localized mass additions—like patches or sensor

housings—can and do disrupt balance amplified by the fact that the added mass of the patch is placed at the greatest distance from the axis of rotation and if not carefully minimized and strategically placed, so a person of skill designs attachments to be as lightweight and compact as practicable to mitigate the need for compensatory balancing and to maintain performance, safety, and durability.

42. Accordingly, the POSITA was motivated to avoid modifying traditional technologies by adding unnecessary barrier layers with added mass or elements within such as RFID tags as they would directly lead to thicker, heavier or more robust patches.

43. It is against this background of the technology that the innovations of the ’027 patent came to be.

A. Response to Mr. Donley’s Declaration

44. I note that Mr. Donley did not discuss the use of mold release agents to ensure that rubber materials will not stick to and will easily release from the mold after forming/ vulcanization. EX1003 ¶¶ 23-24. These mold release agents are traditionally harmful chemicals that can withstand high heat act as a buffer to prevent the rubber products from sticking to the metallic molds. EX2031 (https://chemtrend.com/chem-trend-release-agents/). These release agents often remain on the tire and become somewhat embedded in the outer layers of the tire, leaving an often oily residue when a tire is touched. Within the tire industry there

are multiple techniques used by various tire manufacturers to facilitate easy demolding of a cured tire from the mold which include but are not limited to application of a mold release agent to the mold itself or a spraying of such an agent on the green tire itself. Both of these techniques involve leaving a residual material on the external surface of the demolded tire. *Id.* This was another barrier or drawback in the art that prior art patches failed to account for as these mold release agents can leach through the patch and cause yellowing or degradation of the patch sometimes referred to as staining without the use of a barrier material composition as taught by the ’027 patent. EX1001 at 6:40-47 (“Elastomeric materials useful for forming the intermediate layer 24 include and are not limited to gum rubber, vulcanized natural rubber SBR, nitrile rubber, polyurethane, or comparable materials having properties of high elongation, conformity and chemical resistance to notable mold release agents and other common staining chemicals and oils in the vulcanized rubber of pneumatic tires, and combinations thereof.”).

45. With regard to the background of tire patches, to the extent Mr. Donley is referring to prior art patches as teaching multiple layers like those claimed by the ’027 patent, I disagree. *Id.* ¶¶ 25-26. For example, Mr. Donley points to patches from the patch rubber company that appear to be made from a single layer of rubber and an adhesive, *i.e.* a dual cure bonding gum. *Id.* ¶¶ 26-27. This traditional design has the goal of being a rigid patch that is applied along a tire tread inside the tire—it is

not designed to have the functionality to withstand the elements, flexing, or to prevent bleed-through of tire chemicals. This is added functionality not considered in prior art discussed by Mr. Donley. This patch teaches a single layer construction with an added bonding adhesive or gum layer, thereby minimizing weight and preventing throwing the tire off balance. *Id.* ¶¶ 26-28.

46. Mr. Donley uses his last paragraphs to mischaracterize what was known in the art as it relates to display assembly patches as of 2015. Mr. Donley refers to various stickers for tires that are applied with a bonding cement. But noticeably missing from Mr. Donley's description of the background of the art is the teaching of a barrier material construction and prevention of harmful components leaching through the tire and into the patch, nor does Mr. Donley point to cavities built into the patch assemblies for storing elements like RFID devices. Again, this is added functionality in the novel configuration claimed by the '027 patent is not discussed in the prior art cited by Mr. Donley. *Id.* 30-34.

VI. Overview of the '027 Patent

47. The '027 patent relates generally to assemblies "configured for attachment with a vulcanized rubber article a in the form of different material layers." '027 patent at Abstract. The '027 patent explains that traditionally in the art, to add decals or assemblies to a tire sidewall or other area in a permanent manner, one must use "traditional techniques for establishing tire sidewall markings [that]

involve extrusion or molding of black rubber and often the addition of colored inks which are cured in parallel with the tire during the vulcanization process." *Id.* at 1:30-35. In other words, in the prior art it was best to mold any displays or assemblies directly into the tire during manufacturing.

48. Accordingly, the '027 patent states that it is "desired that display assemblies for use with a vulcanized article be constructed in a manner that permits not only variation in the nature of the display itself, e.g., the nature of the indicia be it one or a combination of characters, designs, emblems, and combinations thereof and the like, but variation in the method of applying the same so as to facilitate application as part of or subsequent to the manufacture of the vulcanized article." *Id.* at 1:45-52. "It is still further desired such that display assembly be constructed in a manner so as to facilitate such long-term without sacrificing the integrity and aesthetic appearance of the display assembly." *Id.* at 1:55-58.

49. Thus, the '027 patent discloses that "display assemblies as disclosed herein generally comprise a composite of different material layers specially engineered to provide a desired display indicia in a manner that will last a long time on the vulcanized rubber article." *Id*. at 1:66-2:2. The patent discloses that in some embodiments the "[d]isplay assemblies comprise one or more display layers of elastomeric material configured to provide a desired display indicia, an intermediate layer formed from an elastomeric material different from that of one or more display

layers, and an adhesive layer, wherein the intermediate layer is interposed between the adhesive layer and the one or more display layers." *Id.* at 2:2-9.

50. The '027 patent explains that "[i]n one example, display assemblies as disclosed herein may comprise one or more elastomeric display layers providing the desired display image or function, an intermediate or barrier layer formed of an elastomeric material, and a layer of curable adhesive that is formed from a material capable of forming a strong adhesion bond with a surface of the vulcanized article." *Id.* at 4:3-9.

51. The '027 patent discloses a "barrier layer 24 is formed from a material capable of providing properties of ***shock absorbance, elastomeric expansion and/or contraction properties*** compatible ***with the vulcanized rubber article that the display assembly is to be attached therewith***, and a desired degree of conformity between the adjacent surfaces of the display layer and the outer surface of a vulcanized rubber article (so as to maximize the surface contact area between the display assembl[y] and vulcanized rubber article)." *Id.* at 6:19-28 (emphasis added). The construction of the assembly may be "one or more elastomeric display layers providing the desired display image or function, an intermediate or barrier layer formed of an elastomeric material, and a layer of curable adhesive that is formed from a material capable of forming a strong adhesion bond with a surface of the

vulcanized article." *Id.* at 4:3-9.

52. The '027 patent discloses various embodiments showing its multi-layered construction, including a barrier material construction:

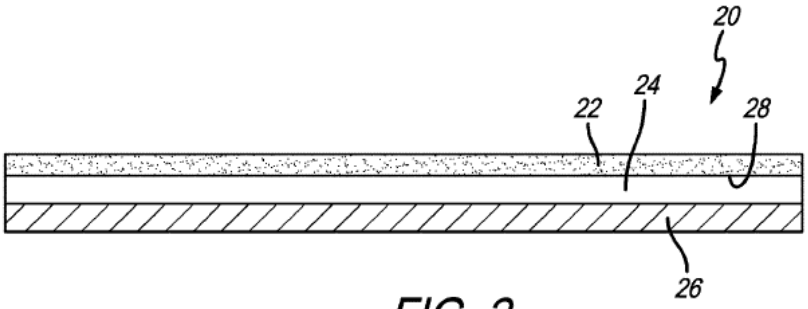


FIG. 2

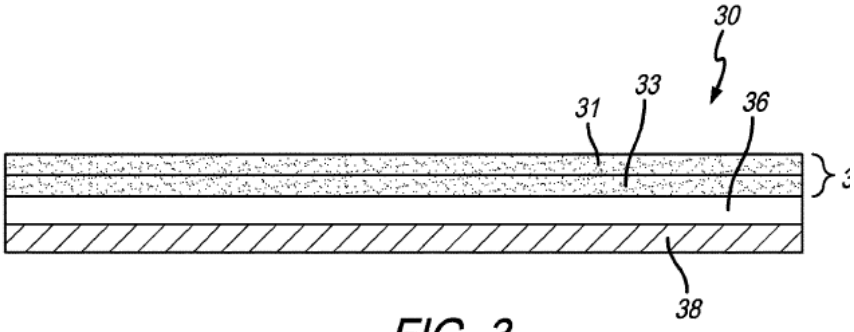


FIG. 3

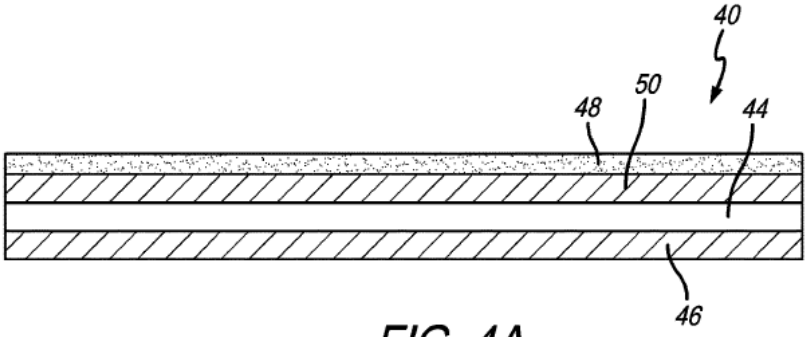


FIG. 4A

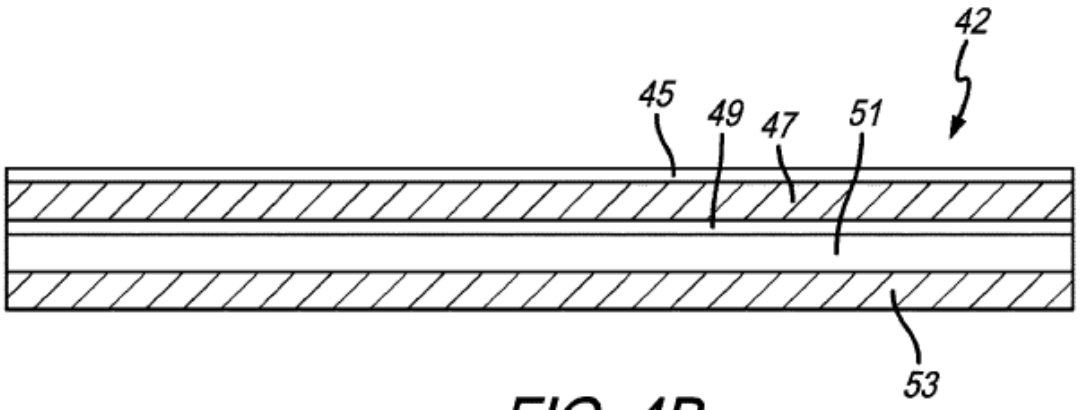


FIG. 4B

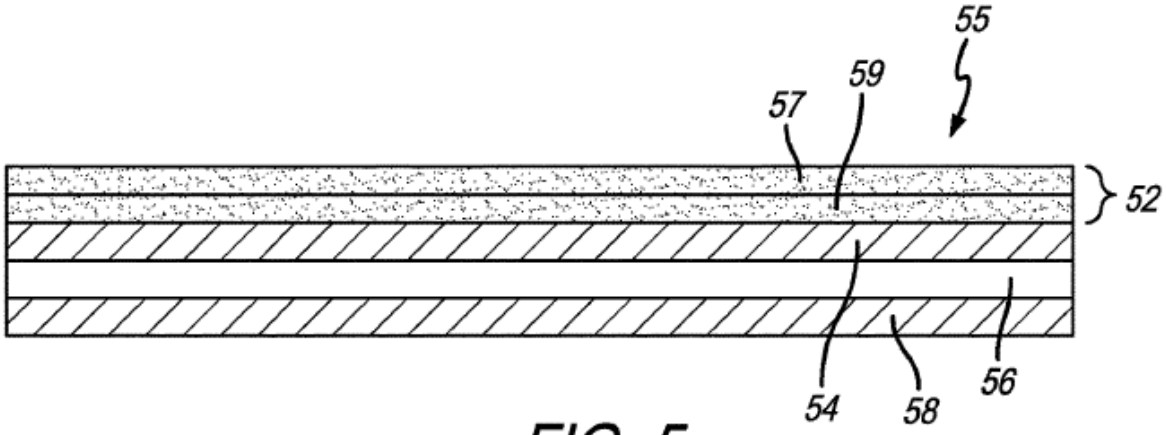


FIG. 5

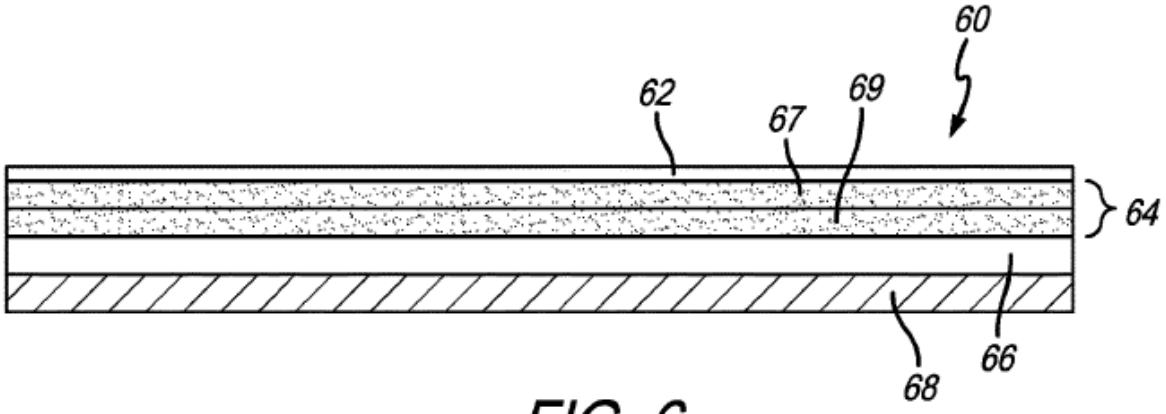


FIG. 6

Id. at Figs. 2-6.

53. For example, "Fig. 2 is a cross-section side view of a single display layer embodiment three-layer assembly '20' as disclosed herein, wherein layer '22' is defined as the outermost aesthetic layer which is vulcanized for a permanent bond along underside surface '28' to a shock absorbing barrier layer '24' layered with an adhesive layer '26' for permanently bonding to the vulcanized rubber article." *Id.* at 2:58-64.

54. The '027 patent also explains that "the intermediate or barrier layer 24 is formed from a material capable of providing properties of shock absorbance, elastomeric expansion and/or contraction properties compatible with the vulcanized rubber article that the display assembly is to be attached therewith …." *Id.* at 6:19-28. And it is "also desired that the intermediate or barrier layer 24 be formed from a material capable of acting as a barrier to or minimize or prevent the migration of any unwanted constituents of the adhesive layer 26 and/or the vulcanized rubber article may otherwise operate to damage or degrade the design image and/or feature provided by the display layer 22." *Id.* at 6:33-39.

55. In one example, the "[d]isplay assemblies comprise one or more display layers of elastomeric material configured to provide a desired display indicia, an intermediate layer formed from *an elastomeric material different from that of the one or more display layers*, and an adhesive layer …." EX1001 at 2:2-9. "It is also

desired that the intermediate or barrier layer 24 be formed from a material capable of acting as a barrier to minimize or prevent the migration of any unwanted constituents of the adhesive layer 26 and/or the vulcanized rubber article may otherwise operate to damage or degrade the design image and/or feature provided by the display layer 22." *Id.* at 6:33-39. "[D]epending on the particular size and configuration of the display assembly 20, it is desired that the intermediate layer 24 thickness be that which is sufficient to enable the intermediate layer to function in the above described manner." *Id.* at 6:47-54. The "thickness of the intermediate layer is understood to vary depending on the particular type of material selected for the intermediate layer as well as the particular end-use application." *Id.*

56. Regarding the adhesive layer, the '027 patent discloses that it is desired that it be "formed form a material capable of forming a chemically, heat-activated or otherwise permanent bonded attachment with the vulcanized rubber article." *Id.* at 6:59-62.

57. The '027 patent further explains embodiments with "a cavity 78" where, for example, the cavity "is formed in the display assembly 70 for the purpose of accommodating placement of an element or object 79 therein." *Id.* at 11:30-33. "Examples of the types of objects or elements that may be disposed in the cavity include RFID elements, GPS elements, lighting elements such as LEDs or the like," and the "cavity is configured within the construction to provide an area capable of

accommodating such an element or object without damaging the element or object ….” *Id.* at 11:57-62. Figure 7 demonstrates this cavity that is formed within the assembly, and allows an element to be inserted therein after manufacturing:

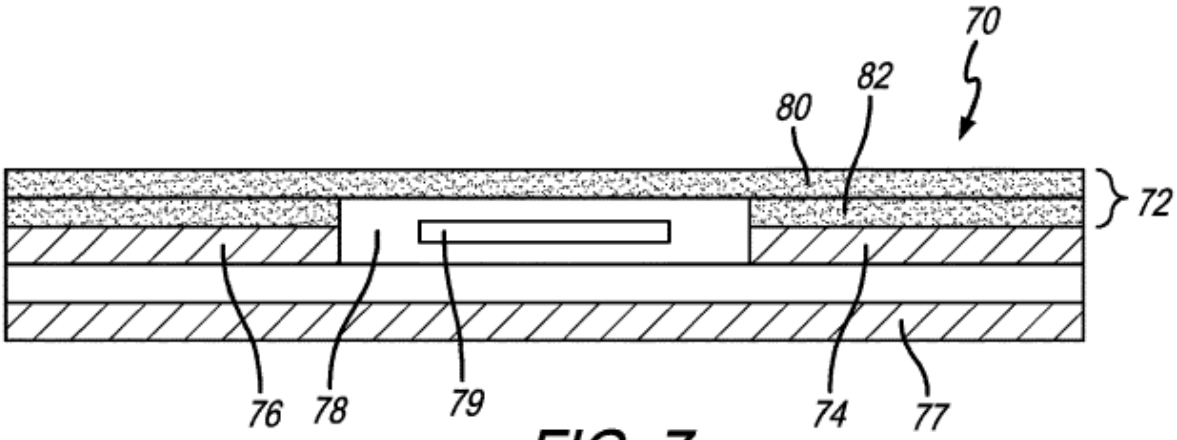


FIG. 7

58. The ’027 patent contains 23 claims, including independent Claim 1, 11, 15, and 19, and their respective dependent claims.

VII. Prosecution History

59. During prosecution, the examiner rejected the claims as anticipated or obvious over U.S. Pat. No. 5,300,164 to DeTrano and U.S. Patent No. 6,235,376 to Miyazaki. The examiner pointed to DeTrano for the disclosure that its “barrier layer may [be] an adhesive layer; and Col. 6, lines 31-35: the adhesive layer, such as adhesive layer 24, may also function as a barrier layer in a manner similar to barrier layer 22. The adhesives discussed hereinabove may have barrier properties to

prevent staining of visible layer 12." EX1002 at 53.

60. In response to the examiner's rejection, the Patent Owner amended independent claims 1 and 11 as follows:

1. (Currently Amended) An assembly for attachment with a vulcanized rubber article comprising:

an outer layer of elastomeric material having a visual feature; and

an adhesive layer adhered to an interface surface of the outer layer, wherein at least a portion of the outer layer adjacent the interface surface comprises ~~one or both of the outer layer or the adhesive layer has~~ a barrier material composition, and wherein the adhesive layer is formed from a material capable of chemically bonding with a surface of a vulcanized rubber article.

11. (Currently Amended) A method for attaching an assembly to a surface of a vulcanized rubber article comprising the steps of;

identifying a surface of a vulcanized rubber article;

placing an assembly into contact with the identified surface, ~~,~~wherein the assembly comprises:

an outer layer of elastomeric material, wherein the outer layer is in contact with an adhesive layer interposed between the ~~prepared~~ identified surface and the assembly that bonds the assembly to the vulcanized rubber article, and wherein ~~one of~~ the outer layer ~~or adhesive layer~~ comprises a barrier material composition to mitigate migration of material from the vulcanized rubber article.

EX1002 at 41-42.

61. The Patent Owner explained that "[o]ne having ordinary skill in the art aware of DeTrano would not find suggestion or motivation to make an assembly as recited in Applicant's independent claims 1 and 11 wherein the outer layer comprises

a barrier material composition." EX1002 at 38-39.

62. The examiner subsequently allowed the claims. EX1002 at 8-9.

VIII. Claim Construction

63. As explained below, I disagree with many of Mr. Donley's claim construction positions as he applies the claim language and Patent Owner's constructions in a way that is inconsistent with how a POSITA would have understood the terms in view of their plain meaning and the patent specification.

IX. Analysis of the Challenged Claims of the '027 Patent in Light of the Asserted Prior Art

A. Ground 1: Wilson Does Not Disclose Or Render Obvious The Challenged Claims

1. The Barrier Material Limitations

a. Claim 1: "wherein at least a portion of the outer layer adjacent the interface surface comprises a barrier material composition, and"

b. Claim 11: "wherein the outer layer comprises a barrier material composition to mitigate migration of material from the vulcanized rubber article."

c. Claim 15: "wherein at least a portion of the outer layer comprises a barrier material composition to mitigate migration of material from the rubber tire."

d. Claim 19: "wherein the outer layer comprises a material composition that acts as a barrier to material migrating from the vulcanized rubber tire."

64. I disagree with Mr. Donley that a POSITA would have found the barrier material construction limitations obvious in view of Wilson. EX1003 ¶¶ 114-119.

Mr. Donley appears to opine that he is assuming the "barrier material limitation" requires "no quantified amount of shock absorption, elastomeric expansion and/or contraction that is necessary to satisfy its proposed construction," and based on that incorrect assumption that "no quantified amount" of those properties is required, Mr. Donely assumes that "a POSA applying PO's proposed construction, as I do here, would have understood that any rubber material (as an elastomeric material) would necessarily have some properties of shock absorption, elastomeric expansion and/or contraction." *Id.*

65. At the outset, I note that Mr. Donley makes no attempt to interpret the claims from a perspective of a POSITA, nor engage in analyzing the claim scope in view of the plain and ordinary meaning a POSITA would have given the claim term in view of the claims and specification. Rather, Mr. Donley attempts to apply his own view of Patent Owner's construction in the District Court litigation, without consideration of how the construction would be applied by a POSITA.

66. The '027 patent explains that "Elastomeric materials useful for forming the intermediate layer 24 include and are not limited to gum rubber, vulcanized natural rubber SBR, nitrile rubber, polyurethane, or comparable materials ***having properties of high elongation, conformity and chemical resistance to notable mold release agents common in the vulcanized rubber of pneumatic tires, and combinations thereof***." EX1001 at 6:40-47. Notably, when Mr. Donley recites this

portion of the ’027 patent, he failed to include the portion I have bolded and italicized above. In my opinion, a POSITA would consider all of the patent, including the portion explaining the “properties” that a barrier material layer or intermediate layer should have. Accordingly, unlike Mr. Donley’s position that a POSITA would require “no quantified amount of shock absorption, elastomeric expansion and/or contraction that is necessary to satisfy its proposed construction,” in actuality a POSITA would have understood that the claims require a specific composition of an elastomeric material to ensure that the barrier material layer acts as a barrier, as the claim states, and provides the shock absorption, elastomeric expansion and/or contraction necessary to allow for a durable connection with the vulcanized item the assembly is designed to attach to.

67. A POSITA would not have applied Mr. Donley’s view of the claims as doing so would read all meaning out of the claims and would ignore portions of the specification altogether.

68. Mr. Donley’s paragraphs 116-117 are incorrect for the same reasons. There, Mr. Donley attempts to apply his incorrect view of the claims and argues that because Wilson discusses certain rubber compositions, that therefore “Any of these rubbers disclosed by Wilson would satisfy the claimed ‘barrier material composition,’ including the expressly disclosed natural rubber, the preferred mixture of chlorobutyl rubber and natural rubber, and the preferred mixture of SBR and

natural rubber ….” EX1003 ¶ 117. As explained above, a POSITA would not have viewed the barrier material construction as merely requiring any rubber construction.

69. Mr. Donley further opines that a “POSA would have known that the mixture of chlorobutyl rubber and natural rubber disclosed in Wilson was a well-known rubber barrier material that had long been used for protecting white wall tires from discoloration.” EX1003 ¶ 118. But Mr. Donley provides no explanation as to why a POSITA would look to Wilson and combine DeTrano’s alleged teaching of a barrier with the Wilson reference. In fact, as Mr. Donley points out, a POSITA would not be motivated to make this combination as the DeTrano reference relates to white walled tires that are molded with white walls from the factory, where the mold is designed to form a balanced tire. On the other hand, a POSITA looking to Wilson would minimize weight and height of the tire sticker to avoid imbalance in the tire and to avoid too high of a projection from the tire that would be at risk of catching on obstacles. In sum, Mr. Donley does not provide any explanation or justification for combining these teachings to add a barrier material construction or layer, nor would a POSITA have been motivated to combine these teachings.

70. Mr. Donley’s concluding paragraph demonstrates the error in his argument. Mr. Donley argues that “if the entire patch 10 in Wilson is constructed from the ‘barrier material composition’ (i.e., rubber), then that portion ‘adjacent the interface surface’ is also constructed from that composition (because all of it is) and

therefore the claim language is satisfied." *Id.* ¶ 119. In other words, Mr. Donley is admitting that his flawed reasoning is premised on the "barrier material composition" merely being any rubber, and therefore the claims are met by merely any rubber product, regardless of whether it has a barrier material composition. *Id.* In my opinion based on my review of the evidence and experience in the field, a POSITA would assign meaning to each claim term and would not view the patent as merely claiming a rubber patch that was known in the art—rather a POSITA would attribute meaning to the claim language requiring a "barrier material composition" and the specification explaining the properties of such composition, including shock absorption, elastomeric expansion and/or contraction and "properties of high elongation, conformity and chemical resistance to notable mold release agents common in the vulcanized rubber of pneumatic tires, and combinations thereof." EX1001 at 6:40-47. Thus, a POSITA would not view Wilson's mere disclosure of a rubber patch as disclosing or motivating the use of a specific material with these properties, nor would a POSITA be motivated to modify Wilson to include these properties as this added functionality is unnecessary to solve the problems that a rubber patch disclosed by Wilson was foreseen to solve.

2. The Impair/ Mitigate Migration of Material Limitations

a. Claim 5: "wherein the barrier material composition impairs migration of a material constituent within the assembly when the assembly is attached to a vulcanized rubber article."

b. Claim 11: "wherein the outer layer comprises a barrier material composition to mitigate migration of material from the vulcanized rubber article."

c. Claim 15: "wherein at least a portion of the outer layer comprises a barrier material composition to mitigate migration of material from the rubber tire."

d. Claim 19: "wherein the outer layer comprises a material composition that acts as a barrier to material migrating from the vulcanized rubber tire."

71. Similar to the "barrier material composition" claims, Mr. Donley again attempts to read any meaning out of the claim language requiring the barrier material composition impair/mitigate migration of material from the vulcanized rubber article and/or assembly.

72. Mr. Donley argues that these claims "[do] not indicate or recite the extent or magnitude to which the barrier material composition needs to impair the migration of a material constituent within the assembly to satisfy the claim and does not provide any baseline comparison against which to assess whether any given material constituent's migration is (or is not) impaired. Nor does the claim limit or describe the nature of any specific "material constituent within the assembly" that is

excluded by the claim." EX1003 at ¶ 124.

73. Mr. Donley's arguments ignore the experience and ability of a POSITA to determine whether or not the barrier material layer acts as the claimed barrier and thereby mitigates or impairs migrations of material through the tire or patch. A POSITA would have looked at the patent's explanation of desired "properties of high elongation, conformity and chemical resistance to notable mold release agents common in the vulcanized rubber of pneumatic tires, and combinations thereof" and would have been capable of designing the patch to impair or mitigate the effects of those mold release agents or other harmful chemicals from the tire, in order to protect the claimed assembly. EX1001 at 6:40-47.

74. Accordingly, Mr. Donley's analysis must fail because it is premised on the incorrect assumption that these limitations lack meaning to a POSITA and would be met by the generic disclosure of a "rubber patch [that] would necessarily impede (to at least some degree) the free flow of materials within Wilson's patch assembly and thereby impair the migration of such materials when the patch is bonded to a vulcanized tire." EX1003 at ¶¶ 125-127.

75. Mr. Donley also fails to explain or show how Wilson discloses, renders obvious, or otherwise motivates a POSITA to make a barrier material composition that impairs or mitigates migration of material. Rather, Mr. Donley merely points to the fact that the Wilson patch is rubber and "may be a rubber selected from …a

mixture of chlorobutyl rubber and natural rubber." Mr. Donley also claims without support that "This rubber mixture was known in the art as having the barrier material composition properties recited in claim 5." I disagree. A POSITA reviewing the Wilson prior art reference would not have understood it to disclose, nor would a POSITA have been motivated to modify Wilson, to add a barrier material construction merely based on Wilson's disclosure of types of rubber that could be used in its construction. Mr. Donley did not point to any teachings that would lead a POSITA to conclude that the Wilson rubber should be constructed or modified to make a barrier material to mitigate or impair migration of material.

76. Next, Mr. Donley points to the Detrano reference, yet Mr. Donley fails to present this as a combination of references in his grounds of proposed invalidity, nor does Mr. Donley explain why a POSITA would have made this alleged combination. EX1003 ¶ 128. As I explained above, a POSITA would not be motivated to make this combination as the DeTrano reference relates to white walled tires that are molded with white walls from the factory, thus a POSITA would not have the same concerns of weight and height that apply when an aftermarket tire patch or attachment is made to the tire. On the other hand, a POSITA looking to Wilson would be looking to minimize weight and height of the tire sticker to avoid imbalance in the tire and to avoid providing too high of a projection from the tire that would be at risk of hanging on obstacles and being pulled off. In sum, Mr.

Donley does not provide any explanation or justification for combining these teachings, nor would a POSITA have been motivated to combine these teachings.

77. I also disagree with Mr. Donley's infringement contention arguments. There, Mr. Donley attempts to pick and choose words from the infringement contentions to reframe the words of the claim as Mr. Donley sees fit. For example, he argues that "It is therefore my further opinion that, because the patch 10 and the dual cure bonding layer 20 in Wilson are made from different materials, it follows from PO's admission that the patch 10 in Wilson acts as a barrier in the same way as the accused dock when the patch 10 is attached to the tire and therefore the patch 10 in Wilson satisfies this claim." EX1003 ¶¶ 129-131. Mr. Donley provides no support for his broad reading of the claim language. Mr. Donley also attempts to rewrite the claim language, inconsistent with how a POSITA would understand it. Mr. Donley's argument is that because Wilson consists of a bonding material layer and a patch layer, the patch is by default a barrier material.

78. While Mr. Donley's arguments may relate to whether Wilson discloses the claim limitations of "an outer layer" and "an adhesive layer," EX1001 at Cls. 1, 11, 15, 19, Mr. Donley ignores the additional limitations that a POSITA would have understood the claims to require. Namely, Mr. Donley fails to show how Wilson's alleged outer layer forms a "barrier material composition" that "mitigates/impairs migration of material." *Id.*; *see also id.* at Cl. 5. Mr. Donley provides no basis for

reading out these limitations.

79. Finally, Mr. Donley argues that:

> "The '027 patent expressly identifies 'vulcanized natural rubber SBR [i.e., NR/SBR]' as an elastomeric material that has the properties recited in this claim. (See '027 patent, 6:33-58.) As discussed, Wilson discloses that the patch 10 can preferably be made of NR/SBR and it is vulcanized prior to application of the dual cure bonding layer and its further attachment as a patch assembly to the tire. (See Wilson, 3:35-67 ("the rubber patch is vulcanized and then assembled to the vulcanized tire").) Thus, in my opinion, the patch 10 in Wilson satisfies claim 5 for this reason as well."

EX1003 ¶ 132.

80. Again, Mr. Donley fails to show how Wilson teaches using these rubber materials as a barrier material composition. A POSITA would have understood that the rubber materials need to be specifically formulated and designed in a layer to act as a barrier material. *See* EX1001 at 6:47-54 ("depending on the particular size and configuration of the display assembly 20, it is desired that the intermediate layer 24 thickness be that which is sufficient to enable the intermediate layer to function in the above described manner" and the "thickness of the intermediate layer is understood to vary depending on the particular type of material selected for the intermediate layer as well as the particular end-use application."); *see also id.* at 6:40-47. Mr. Donley points to no teaching, suggestion, or motivation in Wilson that

would lead a POSITA to make such changes.

B. Ground 2:

81. Ground 2 relies on the same teachings from Wilson for the barrier material composition limitations and therefore fails for the same reasons explained above.

C. Ground 3: Bielicki Does Not Disclose Or Render Obvious The Challenged Claims

1. The Barrier Material Limitations

a. Claim 1: "wherein at least a portion of the outer layer adjacent the interface surface comprises a barrier material composition, and"

b. Claim 11: "wherein the outer layer comprises a barrier material composition to mitigate migration of material from the vulcanized rubber article."

c. Claim 15: "wherein at least a portion of the outer layer comprises a barrier material composition to mitigate migration of material from the rubber tire."

d. Claim 19: "wherein the outer layer comprises a material composition that acts as a barrier to material migrating from the vulcanized rubber tire."

82. I disagree with Mr. Donley that a POSITA would have found the barrier material construction limitations obvious in view of Bielicki. EX1003 ¶¶ 199-206.

83. Mr. Donley appears to opine that "Any rubber material, as an elastomeric material, would have 'properties of shock absorbance, elastomeric expansion and/or contraction,' including specifically the white and black rubber in outer layer 13 and inner layer 15, respectively, of Bielicki's disclosed ID unit/patch.

Thus, in my opinion, Bielicki discloses that the rubber materials in the outer layer 13 and inner layer 15 of the ID unit/patch are each a 'barrier material composition.'" *Id.*

84. At the outset, I note that Mr. Donley makes not attempt to interpret the claims from a perspective of a POSITA, nor engage in analyzing the claim scope in view of the plain and ordinary meaning a POSITA would have given the claim term in view of the claims and specification. Rather, Mr. Donley attempts to apply his view of Patent Owner's construction in the District Court litigation, without consideration of how the construction would be applied by a POSITA.

85. The '027 patent explains that "Elastomeric materials useful for forming the intermediate layer 24 include and are not limited to gum rubber, vulcanized natural rubber SBR, nitrile rubber, polyurethane, or comparable materials ***having properties of high elongation, conformity and chemical resistance to notable mold release agents common in the vulcanized rubber of pneumatic tires, and combinations thereof***." EX1001 at 6:40-47. In my opinion, a POSITA would consider all of the patent, including the specification's explanation regarding the properties of a barrier material layer or intermediate layer. Accordingly, in contrast to Mr. Donley's opinion that any rubber is a barrier material layer, in actuality a POSITA would understand that the claims require a specific composition of an elastomeric material to ensure that the barrier material layer acts as a barrier, as the

claim states, and provides the shock absorption, elastomeric expansion and/or contraction necessary to allow for a durable connection with the vulcanized item the assembly is designed to attach to.

86. A POSITA would not have applied Mr. Donley's view of the claims as doing so would read meaning out of the claims and would ignore portions of the specification altogether. A POSITA would have understood that the requirement of a barrier material construction requires more than the mere construction of rubber that has been used in tire patches for decades.

87. Mr. Donley argues that a barrier material composition is taught by Bielicki's disclosure that "[t]he inner layer 15 is [] a rubber material with a lower durometer than the outer layer 13." EX1003 at ¶ 200. Mr. Donley points to Bielicki's disclosure that:

> The term durometer is used in the art to signify a measurement of the hardness of a rubber material … The inner layer 15 is [] a rubber material with a lower durometer than the outer layer 13 …

Id. (citing EX1004 at 4:44-55 and 4:56-5:2). A POSITA would have understood that durometer in Bielicki is referring to durability, and the difficulty in cutting the rubber with a laser. Ex. 1004 at 4:50-53 ("A higher durometer will be more durable than a lower durometer product."). Accordingly, a POSITA viewing Bielicki would have been motivated to maximize durability of the layers, while balancing the ability to cut a design through the outer layer with a laser. Thus, a POSITA would not be

motivated to create a barrier material layer, as a POSITA would desire rigidity and durability in Bielicki. Mr. Donley does not explain how a POSITA would look to Bielicki's teachings of maximizing the balance between durability (hardness) and preventing the lasers] from cutting too far into a second layer, and thereby be motivated to design a barrier material composition with shock absorbance, elastomeric expansion and/or contraction. A POSITA would be taught away from a barrier material composition because it would lead to a softness that would be susceptible to deep burns from the laser for engraving, negating the purpose of having the barrier material in the first place.

88. Mr. Donley also points to district court infringement contentions, but Mr. Donley fails to explain how the accused products have the same rubber composition or share a barrier material composition as Bielicki. EX1003 ¶ 202. Merely pointing to the fact that the accused products are made of rubber, does not rewrite the claims to cover all rubber products without regard to whether they have a barrier material composition.

89. Next, Mr. Donley points to DiRocco to teach the missing barrier material composition limitation. EX1003 ¶ 203. However, Mr. Donley fails to propose any ground or obviousness combination that combines DiRocco with Bielicki. To the extent Mr. Donley is suggesting it would have been obvious to a POSITA to combine or use the teachings from DiRocco with Bielicki, I disagree.

First, Mr. Donley has provided no such reasoning or basis for his combination that I can analyze. *Id.* Second, Mr. Donley points to DiRocco for the proposition that tire patches are traditionally "stiff and did not flex," and discusses a product with "less resistance to flexing," but that fails to teach a POSITA a barrier material composition with properties of shock absorbance, elastomeric expansion and/or contraction. In fact a POSITA would be taught away from making a thicker patch that includes a barrier material composition as DiRocco instructs the risk of the patch having "edge cracking and breaking loose of the patch from the tire," which is a higher risk when the patch is thicker leading to a higher likelihood of the patch edges rising above the surface and peeling.

90. In sum, Mr. Donley fails to provide any teaching or motivation to modify Bielicki to create a barrier material composition with shock absorbance, elastomeric expansion and/or contraction. Merely pointing to the fact that Bielicki is constructed of rubber or has alleged flexibility, is not enough to show a barrier material composition with shock absorbance, elastomeric expansion and/or contraction.

2. The Cavity Limitations

a. Claim 7: "further comprising a cavity disposed therein."

91. Mr. Donley gives a three sentence summary argument that Bielicki's "outer layer 13 includes a series of cutouts or grooves that form a barcode pattern

12, which are created by using a laser to cut through (ablate) the white outer layer 13 and expose the black inner layer 15" and therefore "Each cutout or groove is a "cavity" under its plain meaning (i.e., an unfilled or hollowed-out space within a mass) and is disposed in Bielicki's multi-layered rubber patch (i.e., the claimed "assembly")." Mr. Donley provides no reasoning or basis from the perspective of a POSITA to which I can respond. Mr. Donley's argument is further inconsistent with the plain meaning of a cavity—Mr. Donley's argument is that a cavity is essentially any surface that is not flat could be a cavity, and therefore the indented lettering in Bielicki forms a cavity. I disagree that a POSITA would have this perspective.

92. A POSITA would have read the cavity limitation in view of the claims and specification. EX1001 at 2:22-24 ("[t]he display assembly may comprise a cavity disposed therein that may include an element disposed therein."); *id.* at 11:48-53 ("[T]he cavity is formed within the second display layer 82 and the intermediate adhesive layer 74 and is configured to accommodate a desired element or object therein, wherein such element or object may be any type of rigid or non-rigid element, passive or non-passive element, functional or nonfunctional element that may be useful for including in the display assembly."). Thus, a POSITA would understand that the cavity is formed in the assembly to hold an element or object. Further, a POSITA would have understood that a cavity does not consist of lettering cut through an outer layer as the specification describes such embodiments using

different terminology, namely: "openings cut into" the "display layer." EX1001 at 8:14-18 ("[T]he first display layer may be of one color and have one or more opening cut into it, and the second display layer is of another color so such color is displayed through the openings to provide a desired visual indicia on the surface of the display assembly.").

93. Accordingly, a POSITA would not have read the '027 patent "cavity" limitations out of the context of the patent and plain meaning of the terms as Mr. Donley attempts to do.

D. Ground 4

94. Ground 4 relies on the same teachings from Bielicki for the barrier material composition cavity limitations, and therefore fails for the same reasons explained above for Ground 3 which I incorporate herein by reference.

E. Ground 5: Bielicki in view of the Patch Rubber Brochure and/or the Tire-Track Brochure, and Brown Do Not Render Obvious The Claims

1. The Cavity Limitations

a. Claim 7: "further comprising a cavity disposed therein."

b. Claim 8: "further comprising an element disposed within the cavity."

c. Claim 9: "wherein the cavity is disposed beneath the outer layer."

d. Claim 16: "wherein the assembly further comprises a cavity disposed therein."

e. Claim 17: "wherein an element is disposed within the cavity."

f. Claim 18: "wherein the cavity is disposed beneath the outer layer."

g. Claim 19: Limitation 19[c]: "a cavity disposed within the assembly for accommodating an element therein;"

h. Claim 20: "wherein at least a portion of the cavity is disposed beneath the outer layer."

95. Each claim at issue for this ground requires a cavity and/or an element placed within the cavity, forming part of the overall assembly. *See also* EX1001 at 11:38-41 (disclosing one feature of the invention is "the presence of a cavity 78 that is formed in the display assembly 70 for the purpose of accommodating placement of an element or object 79 therein."). The prior art relied on by Mr. Donley fails to teach this limitation as it teaches toward integrally forming objects beneath layers of

a patch without a cavity. Further, Mr. Donley does not explain why or how a POSITA would combine Brown with the references besides merely stating the references are in similar fields and complimentary. And Mr. Donley's proposed combination further fails as it relies on the same incorrect barrier material composition teaching explained above for Ground 3.

96. A POSITA would not have been motivated to make the combination Mr. Donley proposes because a POSITA at the time of the '027 patent would have been motivated to minimize thickness of the overall patch and would not have sought to add additional layers to the Brown patch. EX2032 (https://www.lugwrenchheroes.com/blog/how-long-can-you-drive-on-a-repaired-tire-?) ("After fixing a tire, how the vehicle drives may change. Plugging a tire can make the steering feel off because it affects the tire's balance."). Mr. Donley fails to overcome this fact.

97. Furthermore, a POSITA would have understood that the proposed combination was unworkable, further weighing against combining these references. Mr. Donley does not address the incompatibility of the references. Namely, a POSITA would have understood that the Bielicki reference teaches the use of a laser to cut through the layers with heat. This would lead to potential damage of an element placed within a cavity, or to the cavity itself as the outer layer was cut through revealing the cavity beneath. EX1004 at 4:62-67 ("This has been confirmed

by experiments that used the same laser 20 in a ***first and second pass*** to cut a first and second trough or groove into the ID unit. If the outer layer 13 had a greater ablation rate than the inner layer 15, ***the depth of the first pass would have been slightly less than that of the second pass***.")

98. A POSITA would have further not been motivated to make the combination suggested by Mr. Donley as it would have led to difficulties in manufacturing due to the addition of a formed cavity within the assemblies that would remain intact after experiencing the high temperatures experienced by the production process. Accordingly, a POSITA viewing the references would not have looked to Brown, especially in view of the Tire Track Brochure which Mr. Donley argues as teaching a simpler method of inserting an RFID element between layers without a cavity. Accordingly, the references teach away from the formation of a cavity formed in the assembly that is designed to hold an element such as an RFID device.

X. Objective Indicators Of Non-Obviousness

99. I have analyzed the indicators of non-obviousness which I am informed by counsel must be analyzed as part of the obviousness inquiry as they may indicate that an invention that may otherwise appear obvious, are in fact not obvious when considered in view of these objective indicators. I further understand that these

objective indicators help to ward against hindsight bias.

A. Long-Felt But Unmet Need

100. I have worked in the development and deployment of tire construction and tire patch assemblies for more than three decades. Based on my experience, review of industry practices, and understanding of the state of the art leading up to the filing of ’027 patent, there was a pronounced long-felt and unmet need for a durable, tire-mounted identification solution capable of reliably surviving the operational environment of a pneumatic tire or other vulcanized article while enabling electronic tracking, including via RFID-type elements.

101. Beyond OEM manufacturing, based on my experience in the industry there was a long felt need to be able to apply stickers to tires in the aftermarket, so that people could customize their cars without buying an entire new set of tires. ’027 patent at 1:22-58. Consumers and enthusiast communities consistently sought safe, durable ways to add branding, personalization, and visual accents to existing tires without compromising balance, adhesion, or safety. *E.g.*, EX2033 (https://www.triumphrat.net/threads/painted-lettering-on-tires-thoughts.212149/) (discussing use of paint pens to customize tires going back decades, but discussing the issue of durability); EX2034 (https://www.jalopyjournal.com/forum/threads/smoothing-tire-sidewalls-removing-lettering.848043/) (same). The absence of a reliable assembly that could

withstand the harsh environment of a vulcanized article like a tire—heat, flex, oils/plasticizers, abrasion, and retreading—meant that customization typically required purchasing new tires with molded or factory-applied markings, an option that was cost-prohibitive and impractical for most users. This issue was compounded for companies with fleets of vehicles that necessarily could not install the same set of tires and markings on all of its vehicles due to differences in wheel sizes and availability, but yet needed a unique and consistent marker or tracker for those vehicles. A durable, tire-mounted assembly capable of maintaining adhesion and legibility on in-service tires directly addresses this gap in aftermarket customization.

102. There was also a long felt need so that tracking and identification could be performed, which is a major help to logistics companies that have thousands of tires on the road at all times. *See* EX2035 (https://www.moderntiredealer.com/industry-news/commercial-business/article/11534183/commercial-dealers-change-with-their-markets-2014-10-21) (discussing programs offered by tire dealers to address this long felt problem where "[f]or any size fleet, we offer fleet surveys and inspections to make sure they are using the correct tire for the specific application and getting the most out of their tires for the budget they have allotted," and "[f]or both commercial and OTR customers, minimizing downtime is crucial for their bottom line, so we have worked hard to give them the products and service they need as soon as they need it.").

Identifying where the tires are, if they are potentially stolen, and how far they have traveled is critical to managing and maintaining the fleet and preventing costly breakdowns. Fleet operators needed accurate tire-level data to schedule rotation, retreading, and replacement; to prevent unauthorized swaps or theft; and to correlate mileage with wear and failure modes. Without durable identification that can be applied in the aftermarket and survive real-world service, operators have to rely on visual inspections when vehicles go in for service, and fleets face more inventory uncertainty, increased downtime, and higher lifecycle costs. A durable identification assembly—especially when integrated with RFID-type tracking elements—provides the persistent, scannable identity that the industry needed.

103. Despite this need, it went unmet. The operating conditions encountered by tires present a uniquely hostile environment for a label or embedded tracking element. Issues like cyclic flexure, elevated temperatures during operation and curing, exposure to oils and plasticizers, moisture ingress, road debris, centrifugal forces, and abrasion all prevented the need from being met. For example, traditional print-based stickers lacked the physical resilience needed to remain legible and affixed for the full life of a tire.

104. The industry's long-felt need sought a practical, scalable, and durable tire assembly that could be applied or integrated without compromising tire performance, that would meet environmental stresses for the tire's service life, and

that would consistently enable placement of elements within a protected cavity. Despite numerous attempts, these goals remained unmet, despite the need. For example, I'm aware that Mr. Bielicki and his companies repeatedly tried to solve this problem, including by modifying patch technology to include an RFID chip embedded in a patch, but repeatedly failed to achieve the claimed result until after the '027 patent. EX2036. Petitioner's expert further confirmed the failure of others to reach this solution in an email. EX2026. This evidence is consistent with my understanding of the industry that there was an unmet need for this technology.

B. Unexpected Results

105. The inventions of the '027 patent also yielded results that were unexpected to a person of ordinary skill in the art. Conventional engineering judgment would predict that introducing a barrier composition into a tire sticker or tracker—thereby altering the material composition and thickness—would lead to performance degradation.

106. For example, a thicker layer would be expected to contribute to tire imbalance or nonuniform mass distribution, leading to vibration, premature wear, or the need for compensating weights. EX2030 (https://www.fleetequipmentmag.com/truck-tire-balance-fuel-economy/) (discussing importance of tire balance).

107. Second, differences in modulus, elongation, and elasticity between the

barrier-containing layer, the adhesive, and the tire substrate would be expected to produce strain mismatch leading to eventual delamination. In other words, the barrier material would not move and flex in the same ways as the tire, which would have led a POSITA to believe that the barrier material would be more likely to cause the assembly to peel from the tire.

108. Third, any raised profile would generally be considered more susceptible to edge catch, abrasion, and peeling, especially under thermal cycling and exposure to oils and plasticizers.

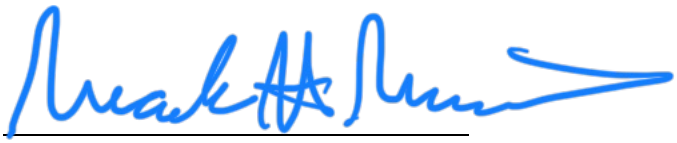
109. Contrary to these expectations, the claimed constructions achieved durable adhesion and in-service stability while incorporating a barrier composition that would ordinarily be considered detrimental. In my opinion, the observed performance is unexpected to a person of skill because it defies common knowledge and industry know-how regarding patch design explained above.

110. From an engineering standpoint, achieving this balance required more than routine optimization. The unexpected nature of the results is evidenced by the fact that prior solutions either minimized thickness at the expense of durability or increased encapsulation at the expense of flexibility and adhesion. In contrast, the ’027 patent’s approach delivered a construction that can withstand the environmental pressures of the tire without sacrificing durability. In my professional judgment, these results would not have been reasonably expected based on the prior art and

provide strong secondary evidence of non-obviousness that a POSITA would understand is directly tied to the claimed features, including a barrier material composition and an element disposed in a cavity.

XI. Conclusion

111. For the foregoing reasons, it is my opinion that the Challenged Claims of the ’027 patent are patentable and should be confirmed over the prior art discussed in the Petition.

Dated: November 18, 2025 By: 

Mark Mineur