

Declaration of Timothy Donley in Support of
Petition for *Inter Partes* Review of
U.S. Patent No. 11,124,027 B2

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

U.S. Patent No. 11,124,027 B2
Issue Date: September 21, 2021

Title: Display Assemblies and Methods for Applying the Same to Vulcanized
Rubber Articles

DECLARATION OF TIMOTHY DONLEY

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I, Timothy Donley, declare as follows:

I. INTRODUCTION AND QUALIFICATIONS

A. Qualifications and Experience

1. I am an independent consultant. All of my opinions stated in this report are based on my own personal knowledge and professional judgment. In forming my opinions, I have relied on my knowledge and experience in working in the tire and the tire patch industry for the past 20+ years, as well as my educational experience.

2. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein. A copy of my current curriculum vitae, which details my education and professional and academic experience, is included as **Appendix A** to this declaration. The following provides an overview of some of my experience that is relevant to the matters set forth in this declaration.

3. I expect to testify regarding my background, qualifications, and experience relevant to the issues in this litigation. I have a B.S. in Chemical Engineering from the University of South Florida. I spent 30+ years in the rubber industry and have experience with designing and manufacturing multiple types of rubber products. I also spent 20+ years developing and manufacturing tires and tire related products. As indicated in my CV, I worked for Cooper Tire & Rubber

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Company for over 16 years, holding such roles as Automotive Chemist, Senior Materials Development Engineer, and Advanced Engineer. Following Cooper, I worked for eight years at Patch Rubber Company as the Director of Engineering. I have familiarity with the prior art product relied on in the Petition, as that product was actively being sold by Patch Rubber Company during my employment there. I have first-hand experience with all aspects of developing and manufacturing tires, including the molding and vulcanization processes.

4. Through these and other experiences, I am very familiar with the technologies at issue in this matter.

B. Materials Considered

5. The analysis that I provide in this Declaration is based on my education, research, and experience, as well as the documents I have considered. In forming my opinions, I have read and considered U.S. Patent No. 11,124,027 B2 (“’027 patent”) [EX1001] and its prosecution history [EX1002]. I have cited to or considered the following documents in my analysis below:

Exhibit No.	Description of Document
1001	U.S. Patent No. 11,124,027 B2 issued to Keith G. Ferry et al. (filed Nov. 27, 2018, issued Sept. 21, 2021) (“’027 patent”)

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Exhibit No.	Description of Document
1002	File History of the '027 patent
1004	U.S. Patent No. 6,726,012 to Bielicki et al. (filed Apr. 25, 2002, issued Apr. 27, 2004) (“Bielicki”)
1005	Know Your Tires with Tire-Track, available at https://web.archive.org/web/20120305232849/http://www.patchrubber.com/training/tire_track.pdf (“Patch Rubber Brochure”)
1006	Patch Rubber Co. Patch Fast-Dry Cement webpage, available at https://web.archive.org/web/20131109143040/http://www.patchrubber.com/tire_repair/16450.html (“Fast-Dry Cement Webpage”)
1007	TIRE-TRACK, LLC, “Reduce Your Tire Costs with the Tire-Track ID Unit” Brochure, available at https://web.archive.org/web/20110304053609/http://www.tire-track.com:80/PDFs/Tire-Track_Brochure.pdf (“Tire-Track Brochure”)
1008	U.S. Patent No. 6,546,982 B1 issued to Robert W. Brown et al. (filed Jul. 29, 1999, issued Apr. 15, 2003) (“Brown”)
1009	U.S. Patent No. 7,009,506 B2 issued to Paul B. Wilson et al. (filed Jul. 9, 2002, issued Mar. 7, 2006) (“Wilson”)
1010	U.S. Patent No. 4,285,382 issued to Jobbie DiRocco et al. (filed Jul. 10, 1980, issued Aug. 25, 1981) (“DiRocco”)
1011	U.S. Patent Application Publication No. US 2005/0059308 to Edwin D. Parsons (filed Sep. 17, 2003, published Mar. 17, 2005) (“Parsons”)
1012	U.S. Patent No. 5,300,164 issued to Mario N. DeTrano et al. (filed Feb. 7, 1992, Apr. 5, 1994) (“DeTrano”)
1013	Britannica.com entry on “Vulcanization”, available at https://www.britannica.com/technology/vulcanization

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1014	The Science and Technology of Rubber, Chapter 7: Vulcanization, available at https://www.sciencedirect.com/topics/chemistry/vulcanization
1015	“The Pneumatic Tire”, U.S. Dept. of Transportation, National Highway Traffic Safety Administration (February 2006), available at https://core.ac.uk/download/pdf/232669607.pdf
1016	Letters Patent No. 3,633 by Charles Goodyear (June 15, 1844), available at https://patentimages.storage.googleapis.com/1a/13/8e/18751846ded131/US3633.pdf
1017	Madehow.com, How Products Are Made, Tires page, available at https://web.archive.org/web/20060220072449/http://www.madehow.com:80/Volume-1/Tire.html
1018	Michelinman.com Passenger Car/Minivan product page, available at https://web.archive.org/web/20120120080145/http://www.michelinman.com/tire-selector/category/passenger-car-minivan
1019	Frequently Asked Questions About the TIRE-TRACK ID UNIT, https://web.archive.org/web/20110304045742/http://www.tire-track.com:80/PDFs/FAQ.pdf
1020	Patch Rubber Company product catalog, available at https://web.archive.org/web/20120608080235/http://www.patchrubber.com/training/patch_catalog.pdf
1021	Patch Rubber Company Tire Track FAQ, https://web.archive.org/web/20120305232849/http://www.patchrubber.com/tire_repair/tire_track_faq.html
1022	Continentaltire.com “How to Build a Radial Tire” page, available at https://continentaltire.com/learn/how-build-radial-tire

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1023	Specialty Tires of America, Inc., Tire Manufacturing Process page, available at https://web.archive.org/web/20140828210541/https://www.stausaonline.com/tire-manufacturing/tire-manufacturing-process/
1024	Joint Claim Construction Chart and Exhibits A–J, Dkt. No. 84, <i>Cerebrum Sensor Techs., Inc. v. Revvo Techs., Inc.</i> , C.A. No. 24-cv-245 (D. Del. Jan. 22, 2025)
1025	HIGHLY CONFIDENTIAL Exhibit 2 to Plaintiff’s Initial Infringement Contentions, <i>Cerebrum Sensor Techs., Inc. v. Revvo Techs., Inc.</i> , C.A. No. 24-cv-245 (D. Del. Oct. 30, 2024)
1026	Plaintiff’s Claim Construction Chart and Evidence, <i>Cerebrum Sensor Techs., Inc. v. Revvo Techs., Inc.</i> , C.A. No. 24-cv-245 (D. Del. Dec. 20, 2024)
1027	Affidavit of Tanya Zeif at the Internet Archive (Archive.org)
1028	Patch Rubber Company, Identification Labels page, available at https://web.archive.org/web/20140322035720/http://www.patchrubber.com/tire_repair/12240.html
1029	Patch Rubber Company, Training & Repair Instructions page, available at https://web.archive.org/web/20130329173114/http://www.patchrubber.com/tire_repair/training.html
1030	Patch Rubber Company, Pilot Wire Patch Plugs, available at https://web.archive.org/web/20111230040320/http://www.patchrubber.com/training/pilot_wire.pdf (redirects to https://web.archive.org/web/20051231123651/http://www.patchrubber.com/training/pilot_wire.pdf)
1031	Patch Rubber Company, Passenger Tire Puncture Repair brochure, available at

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Exhibit No.	Description of Document
	https://web.archive.org/web/20130329173114/http://www.patchrubber.com/training/pass_puncture.pdf (redirects to https://web.archive.org/web/20140207072057/http://www.patchrubber.com/training/pass_puncture.pdf)
1032	Patch Rubber Company, Truck Tire Puncture Repair brochure, available at https://web.archive.org/web/20130329173114/http://www.patchrubber.com/training/truck_punc.pdf (redirects to https://web.archive.org/web/20140207080812/http://www.patchrubber.com/training/truck_punc.pdf)
1033	Patch Rubber Company, Bias Tire Section Repairs, available at https://web.archive.org/web/20130329173114/http://www.patchrubber.com/training/bias_section.pdf (redirects to https://web.archive.org/web/20140207072047/http://www.patchrubber.com/training/bias_section.pdf)
1034	Patch Rubber Company, Radial Tire Section Repair brochure, available at https://web.archive.org/web/20130329173114/http://www.patchrubber.com/training/radial_section.pdf (redirects to https://web.archive.org/web/20140207074553/http://www.patchrubber.com/training/radial_section.pdf)
1035	Patch Rubber Company, Tire-Track Overview page, available at https://web.archive.org/web/20120305232849/http://www.patchrubber.com/tire_repair/tire_track.html
1036	Patch Rubber Company, Tire Repair Materials, Industrial Rubber Products & Traffic Marking Tape, available at https://web.archive.org/web/20120615162141/http://www.patchrubber.com/

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1037	Patch Rubber Company, Tire Repair Products page, available at https://web.archive.org/web/20120615103911/http://www.patchrubber.com/tire_repair/index.html
1038	Patch Rubber Company, Tire/Tube Repair Materials page, available at https://web.archive.org/web/20120615103110/http://www.patchrubber.com/tire_repair/tire_repair.html
1039	Patch Rubber Company, Specialty Materials page, available at https://web.archive.org/web/20111230031204/http://www.patchrubber.com/tire_repair/specialty_materials.html
1040	Patch Rubber Company, Download Catalog page, available at https://web.archive.org/web/20111230033230/http://www.patchrubber.com/tire_repair/download_pdfs.html
1041	Tire-Track LLC, Products page, available at https://web.archive.org/web/20140222221529/http://www.tire-track.com:80/Products.html
1042	Tech International, Repair Manuals page, available at https://web.archive.org/web/20100523163949/http://www.techtirerepairs.com/rmanuals.htm
1043	Tech International, Repair Manual RM-4, available at https://web.archive.org/web/20100523163949/http://www.techtirerepairs.com/_assets/documents/RepairManuals/RM-4%20%20%20Uni-Seal%20Ultra%20Repairs.pdf
1044	Tech International, Repair Manual RM-5, available at https://web.archive.org/web/20100523163949/http://www.techtirerepairs.com/_assets/documents/RepairManuals/RM-5_Two-Piece_Nail_Hole_Repair_Method.pdf

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Exhibit No.	Description of Document
1045	Tech International, Repair Manual RM-7, available at https://web.archive.org/web/20100523163949/http://www.techtirerepairs.com/_assets/documents/RepairManuals/RM-7%20%20%20Bias%20Ply%20truck%20Section%20Repair.pdf
1046	Tech International, Repair Manual RM-10, available at https://web.archive.org/web/20101011101050/http://www.techtirerepairs.com/_assets/documents/RepairManuals/RM-10%20%20%20Centech%20Crown%20Repair.pdf
1047	Tech International, Repair Manual RM-12, available at https://web.archive.org/web/20100525055920/http://www.techtirerepairs.com/_assets/documents/RepairManuals/RM-12%20%20%20Radial%20Earthmover%20Tire%20Repair.pdf
1048	Tech International, Repair Manual RM-15, available at https://web.archive.org/web/20100525054931/http://www.techtirerepairs.com/_assets/documents/RepairManuals/RM-15%20%20%20TOR%20Repair%20Method.pdf
1049	REMA TIP TOP, Passenger and Light Truck Tire Nail Hole Repair Catalog (2011), available at https://web.archive.org/web/20140611110558/http://www.rematiptop.com/downloads/trm/catalogs/RTTNA-NHP-05.pdf
1050	REMA TIP TOP, Catalog page, available at https://web.archive.org/web/20061028135127/http://www.rematiptop.com/Products_Sub_ExstingProducts.htm
1051	REMA TIP TOP, Medium/Heavy Duty Truck Tire Nail Hole Repair Catalog, available at https://web.archive.org/web/20061028135127/http://www.rematiptop.com/Catalogs/RTTNA-NHT-01.pdf

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Exhibit No.	Description of Document
1052	REMA TIP TOP, Passenger and Light Truck Tire Nail Hole Repair Catalog, available at https://web.archive.org/web/20061028135127/http://www.rematiptop.com/Catalogs/RTTNA-NHP-01.pdf
1053	PREMA page, available at https://web.archive.org/web/20140102123146/http://prema-gmbh.de/
1054	PREMA Classic Tyre Repair and Service Consumables 2012/2013 Catalog, available at https://web.archive.org/web/20131030115706/http://prema-gmbh.de/files/PREMA_Classic_Katalog_07052012.pdf
1055	Merriam-Websters definition of “cavity”, available at https://www.merriam-webster.com/dictionary/cavity
1056	Assignment of U.S. Patent No. 6,726,012
1057	Declaration of Dr. Mary K. Bolin

II. PERSON OF ORDINARY SKILL IN THE ART

6. I am informed by counsel that, under the patent laws in effect before the America Invents Act (“AIA”) of 2011, an assessment of claims of a patent filed before the AIA took effect should be undertaken from the perspective of a person of ordinary skill in the art as of the earliest claimed priority date (i.e., the “time the invention was made”), which I have assumed is April 27, 2015. Petitioner reserves the right to challenge this date (which corresponds to the filing date of a provisional application to which the ’027 Patent appears to claim priority) in this or other

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proceedings, as needed. For purposes of this proceeding, however, all relied-upon prior art substantially pre-dates April 2015 so a priority date dispute has no bearing on a finding of unpatentability here.

7. Counsel has advised me that to determine the appropriate level of one of ordinary skill in the art, I may consider the following factors: (a) the types of problems encountered by those working in the field and prior art solutions thereto; (b) sophistication of the technology in question, and the rapidity with which innovations occur in the field; (c) the educational level of active workers in the field; and (d) the educational level of the inventor.

8. The relevant technical field for the '027 patent is vulcanized rubber products, particularly for use in the tire industry. Based on this, and the four factors above, in my opinion a POSA as of April 2015 would have had 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.

9. My opinions regarding the level of ordinary skill in the art are based on, among other things, my over 30 years of experience in the relevant areas, my

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understanding of the basic qualifications that would be relevant to an individual tasked with investigating the methods and devices in the relevant areas, and my familiarity with the backgrounds of researchers and practitioners in the related areas, including colleagues, students, and other individuals, both past and present, who work in these areas.

10. Although my qualifications and experience exceed those of the hypothetical person having ordinary skill in the art defined above, my analysis and opinions regarding the '027 patent have been based on the perspective of a person of ordinary skill in the art in April 2015.

11. My opinions herein regarding the understanding of a person of ordinary skill in the art and my other opinions set forth herein would remain the same if the person of ordinary skill in the art were determined to have somewhat more or less education and/or experience than I have identified above.

III. STATEMENT OF LEGAL PRINCIPLES

12. I am not a patent attorney, nor have I independently researched the law on patent validity. Attorneys for Petitioner explained certain legal principles to me that I have relied upon in forming my opinions set forth in this report.

A. Prior Art

13. I understand that the law provides categories of information that

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constitute prior art that may be used to anticipate or render obvious patent claims. To be prior art to a particular patent under the relevant law, references must have been made, known, used, published, or patented, or be the subject of a patent application by another, before the priority date of the patent. I also understand that the POSA is presumed to have knowledge of the relevant prior art.

14. I have assumed for purposes of this Declaration that claims 1-3, 5, 7-9, 11-13, and 15-22 of the '027 patent are entitled to an April 27, 2015 priority date.

B. Claim Construction

15. I understand that under the relevant legal principles, claim terms are generally given their ordinary and customary meaning, which is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application. I further understand that the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which a claim term appears, but in the context of the entire patent, including the specification.

16. I am informed by counsel that the patent specification, under applicable legal principles, has been described as the single best guide to the meaning of a claim term, and is thus highly relevant to the interpretation of claim terms. And I understand for terms that do not have a customary meaning within the art, the

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specification usually supplies the best context of understanding the meaning of those terms.

17. I am further informed by counsel that other claims of the patent in question, both asserted and unasserted, can be valuable sources of information as to the meaning of a claim term. Because the claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims. Differences among claims can also be a useful guide in understanding the meaning of particular claim terms.

18. I understand that the prosecution history can further inform the meaning of the claim language by demonstrating how the inventors understood the invention and whether the inventors limited the invention in the course of prosecution, making the claim scope narrower than it otherwise would be. Extrinsic evidence may also be consulted in construing the claim terms, such as my expert testimony.

19. I understand that, in Inter Partes Review (IPR) proceedings, a claim of a patent shall be construed using the same claim construction standard that would be used to construe the claim in a civil action filed in a U.S. district court (which I understand is called the “*Phillips*” claim construction standard), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history

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pertaining to the patent.

20. I have been instructed by counsel to apply the “*Phillips*” claim construction standard for purposes of interpreting the claims in this proceeding, to the extent they require an explicit construction. The description of the legal principles set forth above provides my understanding of the “*Phillips*” standard as provided to me by counsel. I have interpreted all the claim terms in accordance with the ordinary and customary meaning of such terms as understood by one of ordinary skill in the art in April 2015.

C. Legal Standards for Obviousness

21. I have been provided the following instructions from the Federal Circuit Bar Association Model Instructions regarding obviousness, which I reproduced in part below. I apply this understanding in my analysis, with the caveat that I have been informed that the Patent Office will find a patent claim invalid in *inter partes* review if it concludes that it is more likely than not that the claim is invalid (*i.e.*, a preponderance of the evidence standard), which is a lower burden of proof than the “clear and convincing” standard that is applied in United States district court (and described in the jury instruction below):

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4.3c OBVIOUSNESS

Even though an invention may not have been identically disclosed or described before it was made by an inventor, in order to be patentable, the invention must also not have been obvious to a person of ordinary skill in the field of technology of the patent [at the time the invention was made] or [before the filing date of the patent].

[Alleged infringer] may establish that a patent claim is invalid by showing, by clear and convincing evidence, that the claimed invention would have been obvious to persons having ordinary skill in the art at the time the [invention was made] or [patent was filed] in the field of [insert the field of the invention].

In determining whether a claimed invention is obvious, you must consider the level of ordinary skill in the field [of the invention] that someone would have had at the time the [invention was made] or [patent was filed], the scope and content of the prior art, and any differences between the prior art and the claimed invention.

Keep in mind that the existence of each and every element of the claimed invention in the prior art does not necessarily prove obviousness. Most, if not all,

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inventions rely on building blocks of prior art. In considering whether a claimed invention is obvious, you may but are not required to find obviousness if you find that at the time of the claimed invention [or the patent's filing date] there was a reason that would have prompted a person having ordinary skill in the field of [the invention] to combine the known elements in a way the claimed invention does, taking into account such factors as (1) whether the claimed invention was merely the predictable result of using prior art elements according to their known function(s); (2) whether the claimed invention provides an obvious solution to a known problem in the relevant field; (3) whether the prior art teaches or suggests the desirability of combining elements claimed in the invention; (4) whether the prior art teaches away from combining elements in the claimed invention; (5) whether it would have been obvious to try the combinations of elements, such as when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions; and (6) whether the change resulted more from design incentives or other market forces. To find it rendered the invention obvious, you must find that the prior art provided a reasonable expectation of success.

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Obvious to try is not sufficient in unpredictable technologies.

In determining whether the claimed invention was obvious, consider each claim separately. Do not use hindsight, i.e., consider only what was known at the time of the invention [or the patent's filing date].

In making these assessments, you should take into account any objective evidence (sometimes called “secondary considerations”) that may shed light on the obviousness or not of the claimed invention, such as:

- (a) Whether the invention was commercially successful as a result of the merits of the claimed invention (rather than the result of design needs or market-pressure advertising or similar activities);
- (b) Whether the invention satisfied a long-felt need;
- (c) Whether others had tried and failed to make the invention;
- (d) Whether others invented the invention at roughly the same time;
- (e) Whether others copied the invention;

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- (f) Whether there were changes or related technologies or market needs contemporaneous with the invention;
- (g) Whether the invention achieved unexpected results;
- (h) Whether others in the field praised the invention;
- (i) Whether persons having ordinary skill in the art of the invention expressed surprise or disbelief regarding the invention;
- (j) Whether others sought or obtained rights to the patent from the patent holder; and
- (k) Whether the inventor proceeded contrary to accepted wisdom in the field.

Federal Circuit Bar Association Model Patent Jury Instructions §4.3c (2014).

22. I am also informed that the United States Patent Office supplies its examining corps with a Manual of Patent Examining Procedure that provides exemplary rationales that may support a conclusion of obviousness, including:

- (A) Combining prior art elements according to known methods to yield predictable results;
- (B) Simple substitution of one known element for another to obtain predictable results;

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(C) Use of known technique to improve similar devices
(methods, or products) in the same way;

(D) Applying a known technique to a known device
(method, or product) ready for improvement to yield
predictable results;

(E) “Obvious to try” – choosing from a finite number of
identified, predictable solutions, with a reasonable
expectation of success;

(F) Known work in one field of endeavor may prompt
variations of it for use in either the same field or a
different one based on design incentives or other market
forces if the variations are predictable to one of ordinary
skill in the art;

(G) Some teaching, suggestion, or motivation in the prior
art that would have led one of ordinary skill to modify
the prior art reference or to combine prior art reference
teachings to arrive at the claimed invention.

Manual of Patent Examining Procedure, §2143 (9th ed. Mar. 2014), E9R-11.2013.

I apply these principles in my analysis below.

IV. TECHNOLOGY BACKGROUND

A. Vulcanized Rubber Tires

23. Rubber tires for vehicles are made of *vulcanized* rubber (and have been for more than the past century). (EX1015, 2.) The process for manufacturing a tire is (and was) well known in the art. The first step is to mix all the raw materials – including raw unvulcanized rubber with various additional components—to form a rubber material composition. (EX1017, 2-3; EX1015, 20.) Next, that rubber composition is used in conjunction with a tire-building machine, where a worker builds up various layers of rubber and supporting structures, such as steel belts and cords, to form the overall construct for the tire. (EX1017, 3; EX1015, 20-23.) At this stage, the tire is referred to as an “uncured” or “green” tire because it has yet to be “vulcanized” (synonymous with being “cured”). (EX1017, 3; EX1015, 24-25.)

24. The green/uncured tire is placed into a mold and then cured/vulcanized so that it can then be used on a vehicle. (EX1017, 3; EX1015, 24-25.) The overall process of converting a “green” tire into a vulcanized tire for commercial use has been generally described by the U.S. Department of Transportation:

As the mold closes, a bladder inside the tire expands and presses the green tire against the mold. The high bladder pressure (several hundred psi) forces the uncured rubber into every detail of the inner surface of the mold. Super-heated steam or hot water is then circulated within the bladder and around the mold

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for about 12 to 15 minutes. This rise in temperature causes a chemical reaction (curing, or vulcanization) to occur in the rubber compounds whereby the long polymer molecules become crosslinked together by sulfur or other curatives. The rubber compounds are transformed in this way into strong, elastic materials in the finished, cured tire. Curing times, temperatures and pressure are computer-controlled to give full cure of the chosen rubber compounds.

(EX1015, 25.) The result is a vulcanized tire that can be sold and used for vehicular purposes.

B. Tire Patches and Labels

25. Patches and labels have long been applied to commercial tires. (*See, e.g.,* EX1020; EX1028; EX1030, 1-2; EX1031, 1-6; EX1032, 1-6; EX1033, 1-2; EX1034, 1-6; EX1042; EX1043, 2; EX1044, 3-4; EX1054, 2-11; *see also* EX1042-EX1048 (Tech® Repair Manuals); EX1049-EX1052 (REMA repair catalogs); EX1027, 69-93, 17-18, 224-226, 227-233, 234-240, 241-243, 244-250, 6-7, 49-61, 36-48, 99-110, 6-7, 49-61, 36-48, 211-223, 190-210, 173-189, 152-172, 127-151, 33-34, 118-126, 111-117) Tire patches have been used to repair vulcanized tires for many decades, such as to repair a hole or leak in the tire. (*See, e.g.,* EX1029-EX1034 (Patch Rubber Company repair manuals); EX1042-EX1048 (Tech® repair manuals); EX1049-EX1052 (REMA repair catalogs).) Within the field, it was well-known that such tire patches are generally constructed with a layer of vulcanized

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rubber that covers the injured portion of the tire and provides the same type of strength and air sealing properties as the tire's rubber material itself. (*See, e.g.*, EX1020, 3-5; EX1015, 632-635; EX1043, 2; EX1049, 3; EX1054, 4-5.) It was also well-known that these tire patches have long been constructed with other layers attached to the vulcanized rubber—i.e., multilayer rubber patches—that provide a secure and reliable attachment between the tire patch and the tire. (*See, e.g., id.*; EX1010 (DiRocco), FIGS. 2, 5, 8.)

26. Many companies have manufactured and sold multilayer tire patches for repairs long before 2015. One well-known supplier of such multilayer tire patches is the Patch Rubber Company (also referred to herein as “PRC”). (EX1020.) For example, the Patch Rubber Company has sold multilayer repair units with a vulcanized rubber layer (black) and dual cure bonding gum layer (gray) as shown in its product catalog from 2012:

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PUNCTURE REPAIR do it right!

Seal the innerliner and reinforce the injury to prevent air loss, completing an industry-approved puncture repair. **A layer of Dual Cure Bonding Gum provides optimal adhesion and simplifies application.** Apply with Fast-Dry Cement (see pg. 7) and the appropriate filler material (see pg. 4).

Bullseye Repair Units

► **Dual Cure**

Bullseye Repair Units provide maximum reinforcement and adhesion making them the preferred patch for the "Do It Right!" industry-approved repair method.

Dual Cure

Order No.	Mfr. Code	Size		Qty/ Box
		Inches	mm	
12-117	BUL DC 10	2 x 3	51 x 76	20
12-118	BUL DC 12	3 x 4	76 x 102	10
12-090	BUL DC 20	3 x 5	76 x 127	10
12-091	BUL DC 22	3 x 6	76 x 152	10

Apply with Fast-Dry Cement (see pg. 7).
Use with appropriate plug filler material (see pg. 4).

The diagram illustrates the Bullseye Repair Units. It shows a stack of four units: 12-117, 12-118, 12-090, and 12-091. A red box highlights the 12-090 and 12-091 units. A detailed view of the 12-091 unit is shown below, with arrows pointing to the 'layer of vulcanized rubber' and the 'Dual Cure Bonding Gum'.

(PRC-2012-Catalog (EX1020), 1, 5 (annotated).)

27. The foregoing excerpt of a commonly constructed multilayer tire patch from the Patch Rubber Company Catalog ("PRC-2012-Catalog") depicts the repair

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patch being applied to the innerliner of the tire (in the upper right corner) to “[s]eal the innerliner and reinforce the injury to prevent air loss, completing an industry-approved puncture repair.” (*Id.*, 5.) As further noted, the “layer of Dual Cure Bonding Gum provides optimal adhesion and simplifies application.” (*Id.*) While merely one example, such multilayer tire patches constructed with a vulcanized rubber outer layer and a gum rubber bonding layer were pervasively known within the field. (*See, e.g.*, EX1043, 2; EX1049, 3; EX1054, 4-5.)

28. The PRC-2012-Catalog further explains, as a POSA would have readily known by 2015, that the multilayer patch with the dual cure bonding gum layer is applied to the tire innerliner using an adhesive cement—here described as PRC’s “Fast-Dry Cement.” (PRC-2012-Catalog, 3, 5.) The “Fast-Dry Cement activates the chemical vulcanization process to bond repair units to the tire casing”:

TIRE REPAIR CHEMICALS

Fast-Dry Cement

Fast-Dry Self-Vulcanizing Cement eliminates the most common cause of failed repairs — lack of proper drying time. Fast-Dry Cement activates the chemical vulcanization process to bond repair units to the tire casing. **Flammable. Flash point -4° F. Shelf life 1 year.**

Order No.	Size	liters	Ship Wt./Case Lbs.	kg	Case Qty.
16-450	1 Qt.	.94	11	5	6
16-451	8 Oz.	.25	7	3	12
16-452	1 Gal.	3.8	32	15	4

16-452

16-450

16-451

(PRC-2012-Catalog, 7.)

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29. A POSA would have also readily understood by 2015 that the use of the vulcanizing cement with the dual cure bonding gum of the PRC patch repair units would result in the repair unit being cured to the tire through chemical vulcanization such that the repair unit would be chemically bonded to the tire:

► Dual Cure Repair Units

Dual Cure Repair Units chemically vulcanize at room temperature or when heat and pressure are applied. Dual Cure Repair Units provide many benefits to the tire repairman:

User Friendly

Our soft, high tack gum is less prone to problems associated with moisture, handling and cement drying time, allowing easy application.

Superior Green Tack

Soft and tacky Dual Cure Base Gum "locks" the repair unit in place until a full cure has occurred.

Optimal Adhesion

Dual Cure Bonding Gum has over twice the adhesive strength of chemical cure repair units.

Flexibility In Use

Depending on your need, Dual Cure Repair Units will fully cure during the retreading process, in a section mold, or with the heat and pressure created by a tire in service.

► Cement Application Procedures

Apply Dual Cure Repair Units with Fast-Dry Self-Vulcanizing Cement (see pg. 7).



(PRC-2012-Catalog, 3 (annotated).)

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30. In addition to tire patches for repair, the application of tire identification labels onto vulcanized tires (or other rubber products) was also well-known within the field. For example, the Patch Rubber Company sold such “Identification Labels” with dual-curing adhesion using the vulcanizing Fast-Dry Cement long before 2015, as depicted in the following excerpt of the PRC-2012-Catalog:

Identification Labels

Dual-curing, high-profile identification labels apply easily and permanently to any tire and most rubber products. Available in a variety of colors, shapes and sizes with custom imprints.

Order No.	Description	Qty/ Box
12-240	1 $\frac{3}{8}$ Color Label - Specify Color	50
12-242	1 $\frac{3}{8}$ Color Label - Specify Color	500
12-244	1 $\frac{3}{8}$ Color Label - Specify Color	1000
12-231	Blue Triangle	100
98-000	Custom* ID Decal	-

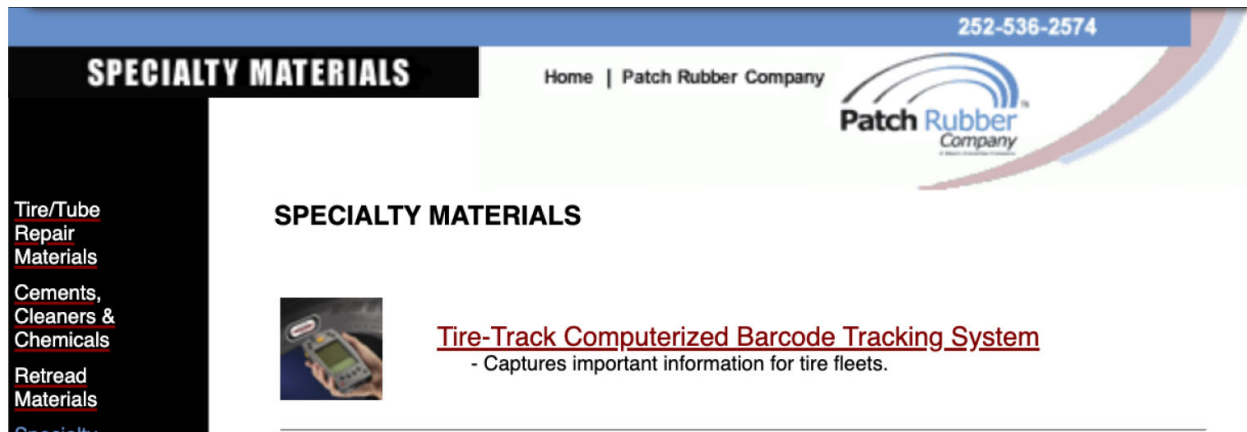
Apply with Fast-Dry Cement (see pg. 7). *Additional setup fee.



(PRC-2012-Catalog, 11 (annotated).)

31. In addition to the foregoing identification labels, the Patch Rubber Company also advertised and sold other identification labels long before 2015, such as with the Tire-Track Computerized Barcode Tracking System:

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(EX1027, 26)

32. The Tire-Track System included a Tire-Track ID Unit for attachment to the sidewall of a tire, which included a barcode and other identifying information, depicted, for example, as follows:

Tire-Track System



The barcode is cut deeply into the rubber for permanent identification, so it cannot wear off.

The Tire-Track ID Unit

(EX1027, 23-24; *see also id.*, 20 (The Tire-Track ID unit “is a multi-layer rubber ‘patch’ specifically constructed to have a bar code cut into the rubber itself”).)

33. The Tire-Track ID unit is applied to the side-wall of a tire in the same

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manner as a repair patch, which was generically described as follows:

Outfit your entire fleet with no downtime!

The Tire-Track ID Unit can be applied to a new or used casing without removing the wheel or pulling the vehicle out of service. Tire-Track ID Units are not affected by the retreading process; the bond is actually improved.

Apply the Tire-Track ID Unit just like a repair patch...No Heat Required!



Buff the Tire Surface



Brush on Cement



Apply ID Unit

(EX1027, 24)

34. While there are instances where labels are applied to green tires as part of the tire manufacturing process, it was also already common by 2015 for such identification labels to be applied to the already cured, vulcanized tire after manufacturing of the tire. (*See, e.g.*, EX1027, 63 (“Can the TIRE-TRACK ID UNIT be applied to any tire? Yes, it can be applied to your current tire inventory, new tires and even ‘green’ uncured tires.”).) For example, U.S. Publication No. 2005/0059308 to Parsons (“Parsons”) [EX1011], which was filed in September 2003, explained that “[w]hile a label can be applied to a green tire and bonded during

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the vulcanization process, it is still desirable to apply labels to a cured tire, for example, the uniformity position markers are attached to a cured tire because certain uniformity measurements are made only on the cured tire.” (Parsons, [0004].)

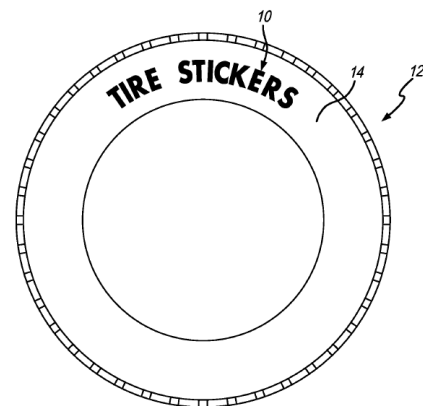
V. THE '027 PATENT

A. Priority Date

35. As noted above, the '027 patent was filed on November 27, 2018 but alleges a priority date from a provisional application filing on April 27, 2015. For purposes of this proceeding only, counsel has asked me to assume that the '027 patent has a priority date of April 27, 2015.

B. Overview of the Specification

36. The '027 patent is titled “Display Assemblies and Methods for Applying the Same to Vulcanized Rubber Articles.” ('027 patent, (54).) As the title suggests, the '027 patent describes “[d]isplay assemblies or constructions” that “are specially engineered to facilitate attachment to a vulcanized article” such as “tires, mud flaps, or any other member or element that is vulcanized or made from vulcanized rubber.” ('027 patent, 3:61-4:18; *id.*, FIG. 1 (at right).) The display assemblies “are provide[d] for the purpose of providing a desired aesthetic



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appearance, product identification, tracking, branding, advertising, to provide a desired functional aspect to the vulcanized article, and the like to such vulcanized article.” (*Id.*)

37. An exemplary display assembly 20 is shown below in Figure 2 of the ’027 patent. It includes a display layer 22, an intermediate or barrier layer 24 and an adhesive layer 26.

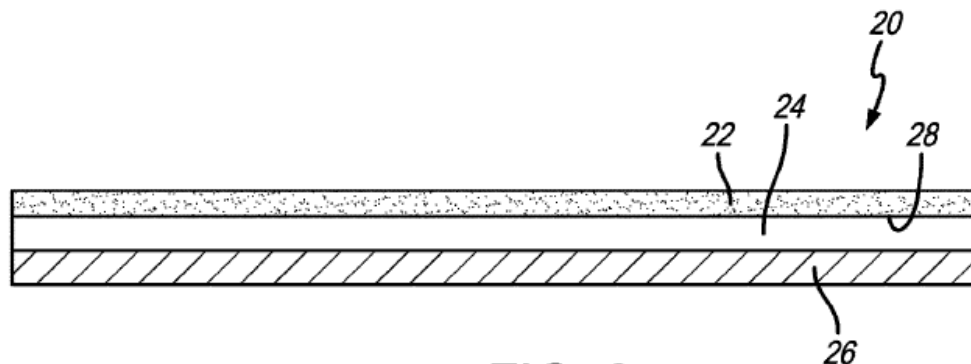


FIG. 2

The display layer 22 may have one or more layers and be “colored, and/or patterned, and/or textured as desired to provide a desired display image or indicia[.]” (*Id.*, 5:55-6:10.) It is described as an “elastomeric material[.]” made from “vulcanized rubber, natural rubber, SBR [i.e., Styrene-butadiene rubber], nitrile rubber, neoprene rubber... and combinations thereof.” (*Id.*)

38. The intermediate or barrier layer 24 is attached to the underside of the

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display layer 22 and is “formed from a material capable of providing properties of shock absorbance, [and] elastomeric expansion and/or contraction properties compatible with the vulcanized rubber article that the display assembly is to be attached therewith[.]” (’027 patent, 6:11-32.) The material is also described as “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 [that] may... damage or degrade the design image and/or feature provided by the display layer **22**.” (*Id.*, 6:33-58.) The ’027 patent discloses that this layer 24 “is formed from an elastomeric material” such as “gum rubber, vulcanized natural rubber SBR, nitrile rubber... and combinations thereof.” (*Id.*) The patent describes an embodiment where the display layer 22 “include[s] a barrier composition... that may operate to provide the barrier properties noted above, thereby avoiding the need [to] use three separate and distinct layers for the display assembly.” (*Id.*, 7:47-60.)

39. The adhesive layer 26 is “formed from a material capable of forming a chemically, heat-activated or otherwise permanent bonded attachment with the vulcanized rubber article.” (*Id.*, 6:59-7:20.) For heat-activated bonds, the ’027 patent describes the adhesive layer 26 formed from “thermoplastic and thermoset adhesives, heat vulcanizing cements common in retread applications, water-based or solvent based polymer polyurethane based adhesives, and combinations thereof.”

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(*Id.*) For ambient temperature bonds, the adhesive layer 26 is formed from “chemical cements common in retread applications, cyanoacrylate, epoxies, rubber-based acrylic pressure sensitive adhesives and combinations thereof.” (*Id.*, 7:21-35.) Notably, the “adhesive layer” that PO has accused in the underlying district court litigation is not made from any of these materials – it is a “cushion gum” made of rubber. (*See, e.g.*, EX1025, 12-15.)

40. In one embodiment, the display assembly includes a cavity 78 for accommodating an object 79. ('027 patent, 11:26-37.) This configuration is shown below in exemplary Figure 7 of the '027 patent.

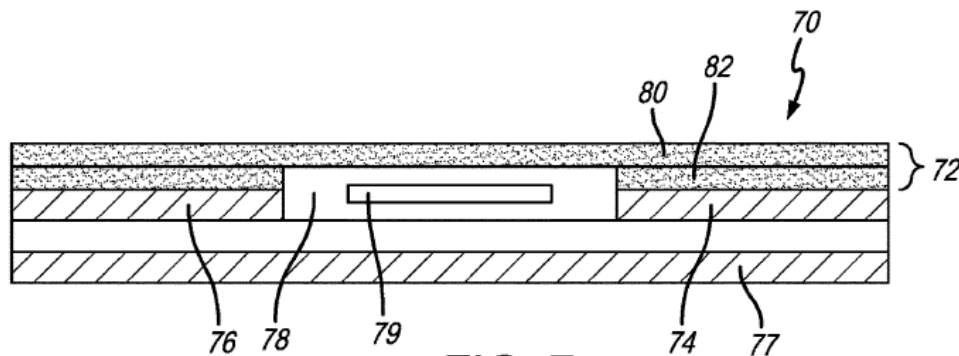


FIG. 7

“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[.]” (*Id.*, 11:48-12:8.) Here, “cavity is positioned beneath the first display layer 80” but “if desired the first display layer may comprise one or more openings for the

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purpose of displaying a portion of the object or element disposed within the cavity.”
(*Id.*)

41. For these reasons, and the specific reasons I discuss below, the Challenged Claims of the '027 patent do not present any novel or inventive features.

C. Prosecution History of '027 Patent

42. I understand that the '027 patent issued from Patent Application No. 16/201,903 (“the '903 application”), which was filed on November 27, 2018. (*See* '027 patent, 1.)

43. I understand that the '903 application was filed as a “Continuation of application No. 15/139,272, filed on April 26, 2016, now Pat. No. 10,137,741” (the “'741 patent”). (*See* '027 patent, 1 (“Related U.S. Application Data”).) The '903 application also identifies the related “Provisional application No. 62/153,441, filed on April 27, 2015.” (*See id.*, 2 (“Related U.S. Application Data”).)

44. As filed on November 27, 2018, the '903 application included claims using language found in the specification, including specifically reciting a “display assembly” and “display layers,” such as with respect to initially filed independent claims 1, 11, 19, which as submitted with the '903 application recited the following:

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What is Claimed is:

1. A display assembly for attachment with a vulcanized rubber article comprising:
one or more display layers of elastomeric material configured to provide a display indicia; and
an adhesive layer adhered to an interface surface of the one or more display layers, wherein one or more of the display layer or the adhesive layer has a material composition that acts as a barrier to impair the migration of material constituents from the adhesive layer to a surface layer of the display layer, and wherein the adhesive layer is formed from a material capable of chemically bonding with a surface of a vulcanized rubber article.
11. A method for attaching a display assembly to a surface of a vulcanized rubber article comprising the steps of;

preparing a surface of a vulcanized rubber article by cleaning the surface;
applying an adhesive material to form an adhesive layer;
placing a display assembly into contact the surface with the adhesive layer interposed therebetween to form a bond between the display assembly and surface, the display assembly comprising:
one or more display layers of elastomeric material constructed to provide a display indicia, wherein one of the display layers having an interface surface with the adhesive layer comprises a material composition that acts as a barrier to impair the migration of material constituents from the adhesive layer to a surface layer of the one or more display layers.

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19. A vulcanized rubber tire comprising:
a target surface disposed along a portion of the rubber tire;
a display assembly disposed onto the target surface and comprising:
 a display layer of elastomeric material; and
 an adhesive layer attached to an interface surface of the display layer;
 wherein one of the display layer or the adhesive layer comprises a material
composition that acts as a barrier to impair migration of material constituents from the
adhesive layer to an outer surface of the display layer.

(EX1002, 247-249.)

45. On February 19, 2019, in what I understand was a “Preliminary Amendment” to the claims, the claims were amended to recite a mere “assembly” (in replacement of a “display assembly”) and an “outer layer” (instead of “one or more display layers”), despite neither of those terms appearing within the specification, as follows:

Listing of the Claims:

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

~~one or more display layers~~ an outer layer of elastomeric material having configured to provide a visual feature display indicia; and

an adhesive layer adhered to an interface surface of the outer layer ~~one or more display layers~~, wherein one or both ~~more~~ of the outer ~~display~~ layer or the adhesive layer has a barrier material composition that acts as a barrier to impair the migration of material constituents from the adhesive layer to a surface layer of the display layer, and wherein the adhesive layer is formed from a material capable of chemically bonding with a surface of a vulcanized rubber article.

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

~~preparing~~ identifying a surface of a vulcanized rubber article ~~by cleaning the surface;~~

~~applying an adhesive material to form an adhesive layer;~~

placing ~~an a display~~ assembly into contact with the identified surface, ~~surface with the~~ adhesive layer interposed therebetween to form a bond between the display assembly and surface, wherein the display assembly comprises comprising:

an outer one or more display layers layer of elastomeric material ~~constructed to provide a~~ display indicia, wherein ~~one of the display layers having an interface surface~~ the outer layer is in contact with the an adhesive layer interposed between the prepared surface assembly that bonds the assembly to the vulcanized rubber article, wherein one of the outer layer or adhesive layer comprises a barrier material composition that acts as a barrier to impair the migration of material constituents from the adhesive layer to a surface layer of the one or more display layers.

19. (Currently Amended) A vulcanized rubber tire comprising:

a target surface disposed along a portion of the rubber tire;

~~a display an~~ assembly disposed onto the target surface and comprising:

~~a display~~ an outer layer of elastomeric material; and

an adhesive layer connected with ~~attached to an interface surface of the outer~~ display layer;

wherein one of the ~~display~~ outer layer or the adhesive layer comprises a barrier material composition ~~that acts as a barrier to impair migration of material constituents from the adhesive layer to an outer surface of the display layer.~~

(EX1002, 215-233.)

46. I understand that the examiner issued a non-final rejection of the foregoing preliminary amendments to the pending claims based, in part, on U.S. Patent No. 5,300,164 (“DeTrano”). (EX1002, 50-62.)

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47. I understand that the pending claims were then further amended by Patent Owner on March 1, 2021, such that claims 1, 11, and 19 were modified to recite the following:

Listing of the Claims:

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.

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19. (Currently Amended) A vulcanized rubber tire comprising:
a target surface disposed along a portion of the rubber tire;
an assembly disposed onto the target surface and comprising:
an outer layer of elastomeric material; and
an adhesive layer connected with the outer layer;
wherein at least a portion of one of the outer layer or the adhesive layer comprises a
barrier material composition to mitigate migration of material from the rubber tire.

(EX1002, 37-44.)

48. I understand that the March 1, 2021 amendments to claims 1 and 11 ultimately issued as claims 1 and 11 in the '027 patent. I also understand that because the pending claims 13 and 15-17 were cancelled, that the March 1, 2021 amended claim 19 issued as claim 15 in the '027 patent. While I have only focused on the three independent claims described in the prosecution history, I understand that additional claims and amendments were included in the prosecution of the claims that ultimately issued within the '027 patent.

VI. CLAIM CONSTRUCTION OF TERMS IN THE '027 PATENT CLAIMS FOR PURPOSES OF THIS PROCEEDING

49. I understand that in the pending district court litigation, Patent Owner has provided infringement contentions and proposed constructions for certain terms within the asserted claims of the '027 patent. For the sole purpose of this proceeding, in general I apply the construction proposed by Patent Owner or in a manner

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consistent with and as implied by Patent Owner's infringement contentions. For one other term, I explain below how a POSA would have understood and applied the term. To the extent Patent Owner has not provided formal construction for terms within the claims of the '027 patent in the district court litigation, solely for the further purposes of this proceeding, I have either applied the plain meaning for such term as it would have been understood by a POSA and/or have indicated how the prior art satisfies such term in the same manner as applied by Patent Owner in its infringement contentions.

50. I understand that Patent Owner's proposed constructions for certain terms recited within the claims of the '027 patent were included in the parties' Joint Claim Construction Chart, which is included as Exhibit 1024. I understand that the column in the Joint Claim Construction Chart with the label "Plaintiffs' Proposed Construction" is the construction that Patent Owner believes should be applied to certain disputed terms in the claims of the '027 patent.

A. "layer"

51. I understand that Patent Owner has proposed that the term "layer" should have its plain and ordinary meaning, which Patent Owner contends means "at least one material disposed over." (*See* EX1024, Ex. A at 1 (Term No. 1).) For the sole purpose of this proceeding, I apply Patent Owner's proposed construction.

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B. “(an) outer layer”

52. I understand that Patent Owner has proposed that the term “(an) outer layer” should have its plain and ordinary meaning, which Patent Owner contends means “at least one layer that is outermost.” (*See* EX1024, Ex. A at 1 (Term No. 2).) For the sole purpose of this proceeding, I apply Patent Owner’s proposed construction that “(an) outer layer” means “at least one layer that is outermost.”¹

53. To be clear, a POSA would understand and apply Patent Owner’s proposed construction consistent with Patent Owner’s proposed construction of the term “layer” and the recited claim language in dependent claim 2 of the ’027 patent. Both Patent Owner’s proposed construction of “layer” and “(an) outer layer” include “*at least one* material” or “*at least one* layer,” respectively, such that Patent Owner’s proposed construction of “(an) outer layer” includes one material layer or multiple

¹ I understand that in the district court litigation, Petitioner contends that the term “outer layer” is indefinite. I provide no opinions regarding Petitioner’s assertion that the term “outer layer” is indefinite in this proceeding because I am merely adopting and applying Patent Owner’s proposed construction for “(an) outer layer” against the prior art.

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material layers. This is also consistent with dependent claim 2 of the '027 patent, which expressly recites that the “outer layer” can have multiple layers: “The assembly as recited in claim 1, wherein the outer layer comprises a first layer and a second layer disposed beneath the first layer.” ('027 patent, claim 2.) That dependent claim 2 recites “comprises,” which I understand is an open transition word that is akin to including at least (and possibly more), further indicates to a POSA that the claimed “outer layer” can include multiple layers, including more than just a “first” and “second” layer, which is consistent with Plaintiffs’ broad “at least one layer” proposed construction for “(an) outer layer.” Under Patent Owner’s proposed construction, a POSA would understand the phrase “that is outermost” to be satisfied so long as the “at least one layer” that comprise the claimed “(an) outer layer” includes an “outermost” layer.²

² I note that claim 6 of the '027 patent recites “a protective layer disposed over the outer layer and forming an outermost surface of the assembly[.]” ('027 patent, claim 6.) In this regard, the claimed “outer layer” would not be the “outermost” layer in the assembly—it would be the protective layer. However, since claim 6 is not presently being challenged in this proceeding and I do not assert any prior art with

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C. “(an) adhesive layer”

54. I understand that Patent Owner has proposed that the term “(an) adhesive layer” should have its plain and ordinary meaning, which Patent Owner contends means “at least one layer that bonds to, vulcanizes to, or otherwise adheres to[.]” (*See* EX1024, Ex. B at 1-2 (Term No. R2).) For the sole purpose of this proceeding, I apply Patent Owner’s proposed construction.

D. “visual feature”

55. I understand that Patent Owner’s has proposed that the term “visual feature” should have its plain and ordinary meaning, which Patent Owner contends means “at least one visual display or a feature that is visually or otherwise detectable.” (*See* EX1024, Ex. B at 3-4 (Term No. R5).) For the sole purpose of this proceeding, I apply Patent Owner’s proposed construction.

an outermost “protective layer,” this flaw in Patent Owner’s proposed construction is not implicated within my opinions.

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E. “barrier material composition”/“material composition that acts as a barrier”

56. I understand that Patent Owner has proposed that the terms “barrier material composition”/“material composition that acts as a barrier” should be construed as meaning “material composition that has properties of shock absorbance, elastomeric expansion and/or contraction.” (*See* EX1024, Ex. A at 3 (Term No. 5).) For the sole purpose of this proceeding, I apply Patent Owner’s proposed construction of these terms as meaning a “material composition that has properties of shock absorbance, elastomeric expansion and/or contraction.”

F. “cavity”

57. I understand that Patent Owner’s has proposed that the term “cavity” should be construed to mean “a space for accommodating an element or object.” (*See* EX1024, Ex. A at 3 (Term No. 6).) For the sole purposes of this proceeding, I apply Patent Owner’s proposed construction meaning “a space for accommodating an element or object” under **Grounds 1, 2, and 5** and the plain meaning of the term “cavity,” i.e., an unfilled or hollowed-out space within a mass, for claims 7 and 16 under **Grounds 3-4**.

58. The ’027 patent does not provide an express definition of “cavity” that departs from the plain and ordinary meaning that it would have to a POSA, which is

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consistent with its standard meaning. In this regard, in my opinion, a “cavity” within the claims of the ’027 patent is an unfilled or hollowed-out space within a mass. (See, e.g., EX1055 (<https://www.merriam-webster.com/dictionary/cavity>)).

59. Dependent claim 7 recites “[t]he assembly as recited in claim **1** further comprising a cavity disposed therein.” Dependent claim 16 similarly recites “[t]he rubber tire as recited in claim **15** wherein the assembly further comprises a cavity disposed therein.” There is nothing relating to the “cavity” in claims 7 or 16 that requires the “cavity” to be solely for the purpose of “accommodating an element or object,” contrary to Patent Owner’s proposed construction.

60. To the contrary, when Patent Owner desired to include a requirement that the claimed “cavity” be limited to a functional requirement “for accommodating an element therein,” Patent Owner expressly did so. For example, claim 19 expressly recites “a cavity disposed within the assembly ***for accommodating an element therein.***” In my opinion, the absence of such “for accommodating an element” language in, for example, dependent claims 7 and 16, indicates to a POSA that a “cavity” does not necessarily have such a requirement. Otherwise, the recited language of “for accommodating an element therein” would be superfluous and redundant.

61. Nevertheless, as I mention above, for the sole purpose of this

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proceeding, as an alternative to the plain meaning of “cavity,” I also apply Patent Owner’s proposed construction of “cavity” in support of my opinions as outlined below.

VII. APPLICATION OF THE PRIOR ART TO THE CHALLENGED CLAIMS

62. I have reviewed and analyzed the prior art references and materials listed in Part I.B above and discussed in more detail in Part VI.A-H below. In my opinion claims 1-3, 5, 7-9, 11-23 of the ’027 patent are obvious based on the following prior art, organized into the five “Grounds” as set forth below.

Ground	Claims	Basis for Challenge
1	1, 5, 7-9, 11-13, 15-22	Obviousness by Wilson
2	12	Obviousness by Wilson in view of DiRocco
3	1-3, 5, and 7	Obviousness by Bielicki
4	1-3, 5, 7, 11-13, 15, and 16	Obviousness by Bielicki in view of the Patch Rubber Brochure and Tire-Track Brochure
5	7-9, 14, 16-23	Obviousness by Bielicki in view of The Patch Rubber Brochure, the Tire-Track Brochure, and Brown

63. I understand that each of the references cited in the grounds above qualifies as prior art to the challenged claims because each reference was filed and/or

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published before the '027 patent critical date.

A. Brief Summary of Prior Art

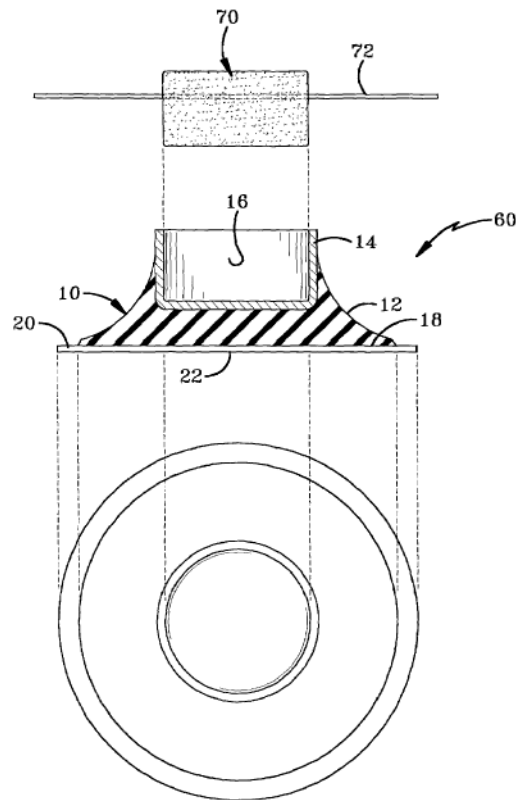
1. U.S. Patent No. 7,009,506 (Wilson) [EX1009]

64. U.S. Patent No. 7,009,506 (Wilson), entitled “Electronic Monitoring Device and Patch Assembly,” was issued on March 7, 2006.

65. The abstract of Wilson explains that it is directed to: “A monitoring device and patch assembly [that] includes a patch that removably and re-attachably holds the monitoring device. The patch is adapted to connect the monitoring device to a pneumatic tire when the monitoring device is held by the patch.” (Wilson, Abstract)

66. Wilson discloses an embodiment of a patch assembly 60 in Figure 1 that includes a vulcanized rubber patch 10 having a first side 12 which includes a housing 14 with a cavity 16 of a preselected configuration to house a monitoring device (“tag assembly 70”) and a second opposite side 18 approximating the contour of an innerliner of a tire to which a dual cure bonding layer 20 is affixed by a non-curing cement (*see* Wilson, 3:35-42, 4:1-3):

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67.

68. Wilson discloses that the vulcanized rubber patch 10 “may be a rubber selected from the group consisting of Ethylene Propylene Diene Monomer (EPDM) rubber, butyl rubber, natural rubber, neoprene and mixtures thereof. One preferred embodiment is a mixture of chlorobutyl rubber and natural rubber. Another preferred embodiment is a mixture of Styrene-Butadiene rubber (SBR) and natural rubber. Typically, patches made of these rubber compositions may be cured by heating to a temperature of about 150° C. and holding at this temperature for about 30 minutes. The time and temperature may be modified as necessary to achieve

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sufficient curing of the patch for further assembly.” (Wilson, 3:48-60.)

69. Wilson discloses that the dual cure bonding layer 20 “may be assembled to the patch at any time following vulcanization of the patch and prior to assembly of the patch assembly to the tire innerliner.” (Wilson, 4:1-6.) “The dual cure bonding layer is permanently assembled to the patch to form patch assembly **60**” using “[a] non-curing cement (not shown) [that] is applied to side **18** of the patch in order to hold the dual cure bonding layer **20** onto the patch.” (*Id.*, 4:6-10.) An “important feature of the dual cure bonding layer is that it can be chemically activated and cured, without the need for heating to an elevated temperature.” (*Id.*, 4:12-15.)

70. Wilson notes that “[t]he dual cure bonding layer may be any material which can be activated and cured to the vulcanized rubber of the tire innerliner and the vulcanized patch,” but preferably “the dual cure bonding rubber is natural rubber.” (Wilson, 4:16-19.) Wilson further discloses that “[e]xemplary non-curing cement and an exemplary dual cure bonding layer are products of the Patch Rubber Company.” (*Id.*, 4:10-12.)

71. Wilson discloses that patch assembly 60 is for attachment to a vulcanized tire: “[i]n a preferred embodiment, the rubber patch is vulcanized and then assembled to the vulcanized tire.” (Wilson, 3:35-67, 4:26-37.) As depicted in

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Figure 2 (below), patch assembly 60 is assembled to inner liner 75 of tire 71 by a process wherein: “Activating cement is first applied to second side 22 of dual cure bonding layer 20. The patch assembly is then stitched to the innerliner of the vulcanized tire and the patch assembly/tire assembly is allowed to cure for a sufficient time and temperature to form a strong bond between the tire and the patch assembly.” (Wilson, 4:26-37.)

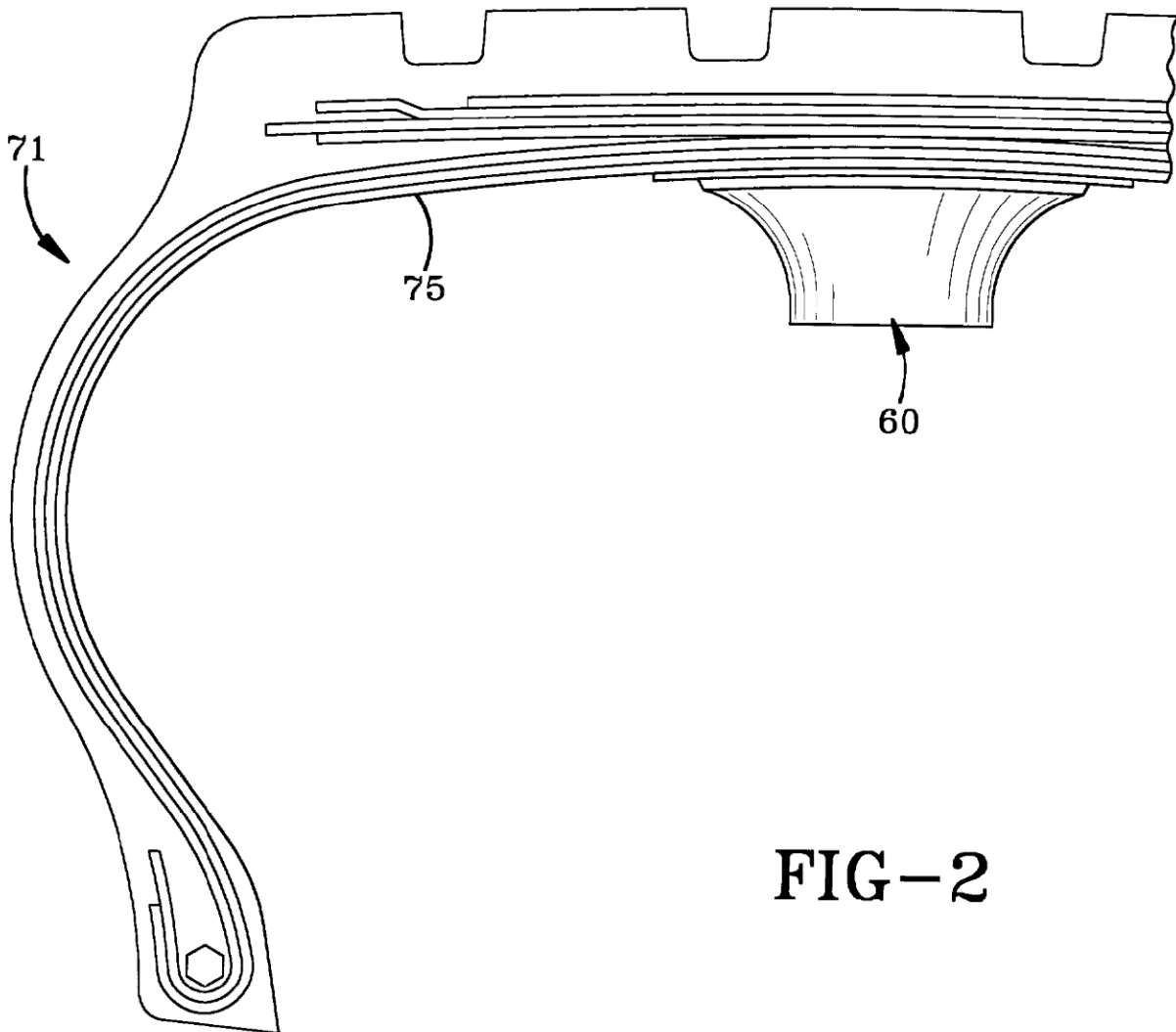


FIG-2

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72. Another embodiment of a patch assembly is shown below in Figure 9 of Wilson. This patch assembly has a rubber patch 140 that includes slots 144 and a ring 146 on the bottom of the slots that mate with tabs 132 on monitoring device 130 to thereby lock the monitoring device into place. (Wilson, 6:17-44 (“Once tabs 132 of tag assembly 130 are mated with slots 144 of rubber patch and tag assembly 130 is inserted into housing 142, tag assembly 130 is rotated sufficiently so that tabs 132 are rotated into ring 146 and no longer are aligned with slots 144, locking the tag assembly to rubber patch 140.”).)

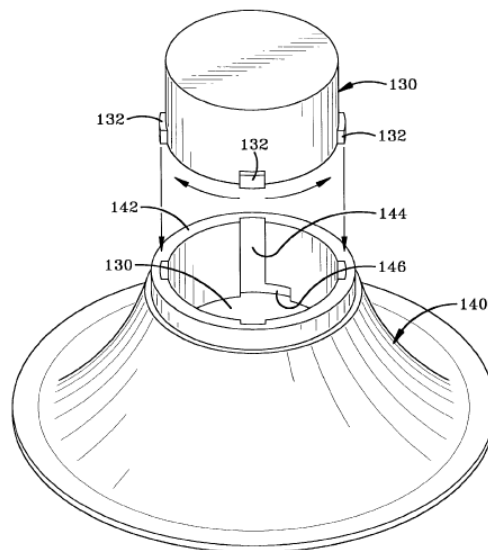
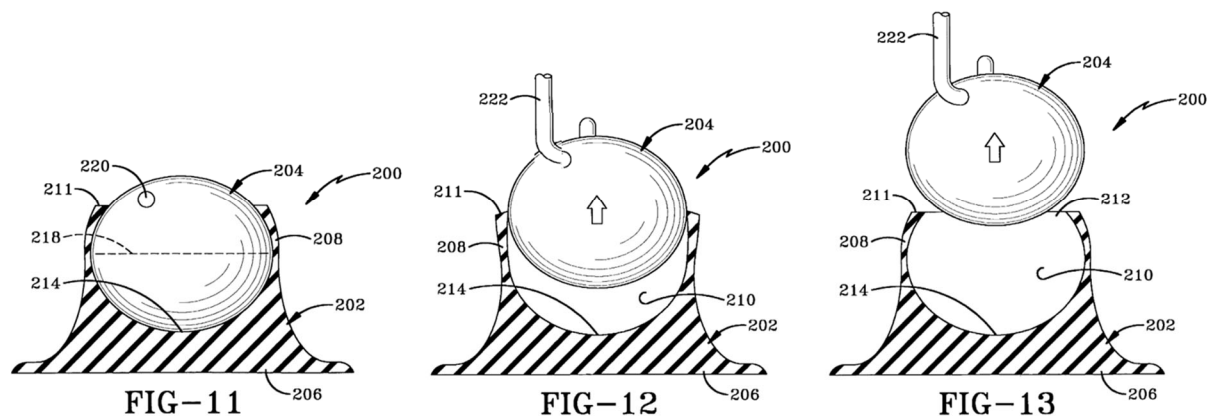


FIG-9

73. Yet another embodiment of a rubber patch holding an electronic monitoring device is depicted in Figures 10-13 of Wilson. (Wilson, 6:45-47 (“The fifth embodiment of the monitoring device (tag) and patch assembly of the invention

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is indicated generally by the numeral **200** in FIGS. 10–13.”.) As shown below in Figures 11-13, in this embodiment, patch 202 includes a base 206 and a tube section 208 that defines a cavity 210 for holding monitoring device 204 in a manner that allows it to be repeatably removable. (Wilson, 7:13-16, 6:49-54.) Patch 202 may include a bonding layer 20 as described above in connection with Figure 1. (Wilson, 7:14-15.)



74. I relied on Wilson as a primary reference under **Grounds 1 & 2** because it teaches each and every limitation of the independent claims of the '027 patent.

2. U.S. Patent No. 6,726,012 (“Bielicki) [EX1004]

75. Bielicki is a patent entitled “Manufacturing a tire tracking identification unit,” is assigned to Tire-Track, LLC, and issued on April 27, 2004. I note that the face of the patent at (73) lists “Tracking Systems LLC” as the assignee. However, I further understand that the company to which Bielicki was assigned was changed

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from Tracking Systems LLC to Tire-Track, LLC in 2004, as reflected in the publicly available information on the United States Patent Office Website as follows that indicates that it was just a “Change of Name”:

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Assignment abstract of title for Application 10132359

Invention title/Inventor MANUFACTURING A TIRE TRACKING IDENTIFICATION UNIT Thomas M. Bielicki, Mark Stephen Bielicki	Patent 6726012 Apr 27, 2004	Publication 20030201202 Oct 30, 2003	Application 10132359 Apr 25, 2002	PCT	International registration
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Assignments (2 total)

Assignment 2

Reel/frame 015478/0552	Execution date Oct 25, 2004	Date recorded Dec 21, 2004	Properties 1	Pages 4
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Conveyance

CHANGE OF NAME (SEE DOCUMENT FOR DETAILS). 

Assignors

[TRACKING SYSTEMS, LLC](#)

Correspondent

NOTARO & MICHALOS P.C.
PETER C. MICHALOS
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ORANGEBURG, NY 10962-2100

Assignee

[TIRE-TRACK, LLC](#)
440 MAIN STREET
RIDGFIELD, CONNECTICUT 06877

Assignment 1

Reel/frame 012838/0267	Execution date Apr 24, 2002	Date recorded Apr 25, 2002	Properties 1	Pages 2
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Conveyance

ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS). 

Assignors

[BIELICKI, THOMAS MICHAEL](#)
[BIELICKI, MARK STEPHEN](#)

Correspondent

NOTARO & MICHALOS P.C.
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Assignee

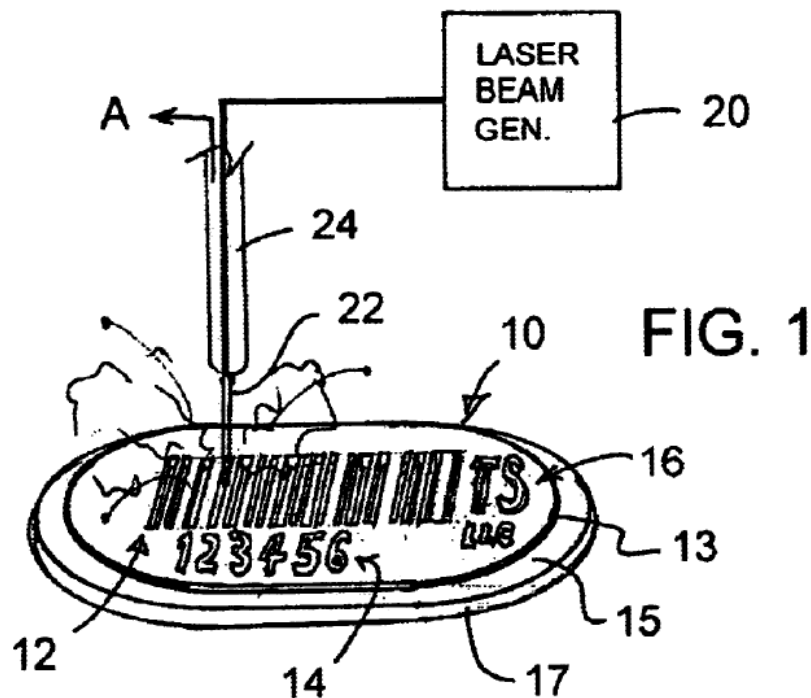
[TRACKING SYSTEMS LLC](#)
440 MAIN STREET
RIDGFIELD, CONNECTICUT 06877

(See also EX1056.)

76. Bielicki describes a method for manufacturing a multi-layered rubber

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identification unit or patch for a tire. (Bielicki, 1:7-11, 2:28-31.) The ID unit includes a bar code pattern cut into the outer layer such that the patch can be used as part of “a tire tracking, inventory and use system.” (*Id.*, 2:32-37.) As illustrated in the embodiment associated with Figure 1 below, the multi-layered ID unit has “an outer layer **13** of one color, e.g. white, and at least one inner layer **15** of a contrasting color, e.g. black. There is also another bottom layer **17** beneath inner layer **15**, which acts as a bonding layer between the ID unit and a tire.” (*Id.*, 3:30-35.) A selected pattern on the ID unit or patch, such as a bar code and associated numbers and/or company logo, is made by scanning an outer layer of the rubber unit with a laser beam to ablate the outer layer in the form of the selected pattern to expose an inner layer of the unit which has contrasting color. (*Id.*, Abstract, 2:33-49, 2:60-67, 3:24-29.)



77. As depicted in Fig. 1, the ID unit or patch comprises “an outer layer **13** of high durometer rubber material” and an inner layer **15**, which “is also a rubber material with a lower durometer than the outer layer **13**.” (Bielicki, 4:44-49, 4:56-59.) “The term durometer is used in the art to signify a measurement of the hardness of a rubber material.” (*Id.*, 4:49-50.) The bottom bonding layer **17** is “a semi-cured gum rubber used as a bonding layer between the ID unit **10** and a tire.” (*Id.*, 5:22-29.) The laser beam **22** causes “[s]harp and deep grooves of the pattern” to be “cut through the full thickness of the white top layer **13** and corresponding black grooves in the inner layer **15** are thereby made visible.” (*Id.*, 3:42-52.)

78. In one embodiment, “[a]lternatively, the ID unit **10** may also have other

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layers between the inner layer **15** and the bottom layer **17** which assist in blocking active oxidants in tires from blackening or browning the white outer layer **13**.” (Bielicki, 5:30-35.)

79. Bielicki expressly discloses that “[t]he unit or patch 10 is supplied by Patch Rubber Company/Myers Industries, Inc. of Roanoke Rapids, N.C.” (Bielicki, 4:44-45.)

80. I rely on Bielicki is a primary reference for **Grounds 3-5** because it discloses or renders obvious each and every limitation of the challenged independent claims.

3. Patch Rubber Brochure [EX1005]

81. **Authentication:** The Patch Rubber Brochure was posted to patchrubber.com, which is owned by Patch Rubber Company, the same company Bielicki identifies as supplying its patch (*see* Bielicki, 4:44-45). I have reviewed this Brochure and am familiar with its contents.

82. I understand that the Brochure was captured by Internet Archive on September 2, 2009. (*See* EX1027, 94; *see also* EX1035 (a webpage captured in 2011 from patchrubber.com displaying the same content as the Patch Rubber Brochure).) I understand that Petitioner has obtained an affidavit from Internet Archive attesting to the accuracy and authentication of this Brochure and the date it was publicly

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available. (EX1027 (Internet Archive affidavit).) I also understand that Petitioner has obtained an affidavit from Dr. Mary Bolin to further authenticate the Brochure and the date it was publicly available (as well as authenticating other textbooks and documents used as evidence in this declaration). (EX1057 (Bolin declaration).) I understand from counsel that the Patent Office considers these types of affidavits as compelling evidence sufficient to authenticate the accuracy and public availability of webpages. Therefore, for the purpose of this declaration, I assume that the Patch Rubber Brochure is authentic and qualifies as prior art.

83. **Description:** The commercially available Tire-Track ID Unit described in the Patch Rubber Brochure (shown below) appears to be similar to (if not the same as) the patch disclosed in Bielicki and the Tire-Track Brochure.



(Patch Rubber Brochure, 3.)

84. The Patch Rubber Brochure provides details for applying the Tire-Track ID Unit to a tire. (Patch Rubber Brochure, 4.) The Brochure claims the user can “[a]pply the Tire-Track ID Unit just like a repair patch... No Heat Required!”

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(*Id.*)



Buff the tire surface.



Brush on cement.



Apply the Tire-Track ID Unit.

The Brochure instructs the user to “[b]uff the tire surface,” “[b]rush on cement” and “[a]pply the Tire-Track ID Unit.” (*Id.*) Also illustrated in the last image is a stitching tool.

85. The cover page of the Patch Rubber Brochure also identifies Tracking Systems LLC, the same company identified as the original assignee on the face of Bielicki. (*Compare* EX1027, 95 with Bielicki, cover page.) Additionally, the last page of the Patch Rubber Brochure states to “[v]isit www.tire-track.com for more information” about the system. (Patch Rubber Brochure, 4.)

86. I rely on the Patch Rubber Brochure as a secondary reference for **Grounds 3-5**, and as a supporting reference throughout.

4. Tire-Track Brochure [EX1007]

87. **Authentication:** The Tire-Track Brochure was posted to tire-track.com, which is owned by Tire-Track LLC—i.e., the same company to which

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Bielicki was assigned in 2004. I have reviewed this Brochure and am familiar with its contents.

88. I understand the Brochure was captured by Internet Archive on March 4, 2011. I understand that Petitioner has obtained an affidavit from Internet Archive attesting to the accuracy and authentication of this Brochure and the date it was publicly available. (EX1027 (Internet Archive affidavit).) I also understand that Petitioner has obtained an affidavit from Dr. Mary Bolin, a librarian and professor with over thirty years of experience with cataloging, researching, and authenticating printed documents, to further authenticate the Brochure and the date it was publicly available (as well as authenticating other textbooks and documents used as evidence in this declaration). (EX1057 (Bolin declaration).) I understand from counsel that the Patent Office considers these types of affidavits as compelling evidence sufficient to authenticate the accuracy and public availability of webpages. Therefore, for the purpose of this declaration, I assume that the Tire-Track Brochure is authentic and qualifies as prior art.

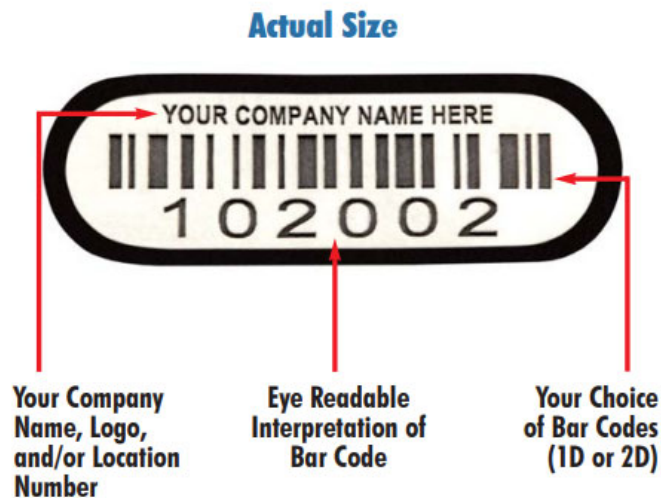
89. **Description:** The Brochure is titled “Reduce Your Tire Costs with the Tire-Track ID Unit.” The CVL-ID Unit described in the Tire-Track Brochure (shown below) is similar to (if not the same as) the ID unit or patch disclosed in Bielicki, being described as “a multi-layered black & white rubber label specifically

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designed for tires” wherein “[t]he bar code and other information is engraved through the white rubber to expose the contrasting black rubber.” (Tire-Track Brochure, 2; *compare to* Bielicki, 3:43-55.)



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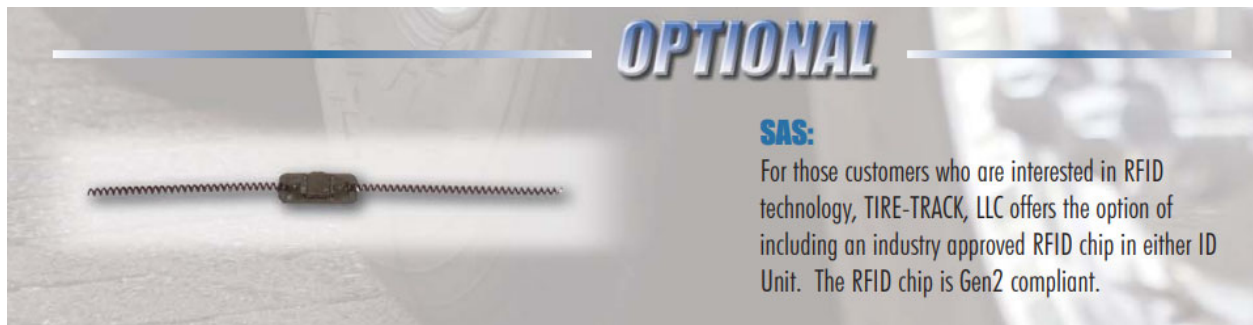


(Tire-Track Brochure, 1-3.)

90. As the brochure discloses, "[t]he CVL-ID UNIT is specifically designed for tires and is constructed similar to a repair patch. It is vulcanized to the tire 'just like a patch' with cold-cure vulcanizing cement, or can be installed during the retread process." (Tire-Track Brochure, 3.)

91. The Tire-Track Brochure further discloses that "[t]he ID UNIT(S) are permanent, all-rubber bar code & RFID (optional) labels":

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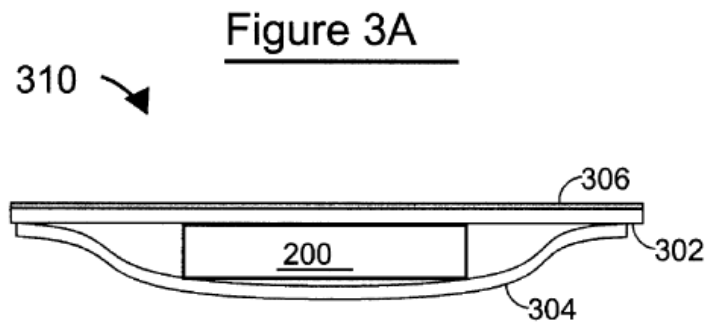


(Tire-Track Brochure, 2, 3 (“For those customers that are interested in RFID technology, TIRE-TRACK, LLC offers the option of including an industry approved RFID chip in either ID unit. The RFID chip is Gen2 compliant.”).)

92. I rely on the Tire-Track Brochure as a secondary reference for **Grounds 3-5**, and as a supporting reference throughout.

5. U.S. Patent No. 6,546,982 (Brown) [EX1008]

93. Brown, entitled “Mounting transponders in pneumatic tires,” is a patent assigned to The Goodyear Tire & Rubber Company that issued by the Patent Office on April 15, 2003. Brown generally discloses methods and apparatus for mounting transponder modules to pneumatic tires using a tire patch. (Brown, Abstract, 17:51-65.) In one embodiment, Brown discloses a patch with a “transponder module **200** being ‘sandwiched’ between two thin sheets **302** and **304**, such as rubber sheets, which are pressed to remove air bubbles from between the sheets and seal their edges.” (*Id.*, 17:58-65.)



(Brown, Fig. 3A.) I rely on Brown for its general teachings of a patch with a cavity having an element disposed therein.

6. U.S. Patent No. 4,285,382 (DiRocco) [EX1010]

94. DiRocco, entitled “Tire repair patch,” was issued by the patent office on August 25, 1981.

95. DiRocco discloses a multi-layer tire repair patch with a “base cushion gum layer of rubber at the surface engageable with the inner surface of the tire..” (DiRocco, Abstract, 1:34-46.) “The application of the patch 10 to the tire 11 follows the procedure well known to those skilled in the art wherein an inner surface 32 of the tire 10 around the injury 12 is cleaned and buffed.” (*Id.*, 4:3-9.) The patch 10 in DiRocco can be applied to the tire and bonded “using either the heat vulcanizing method, the semicure method or the chemical cure method.” (*Id.*, 4:3-14.) “In the chemical cure method, a patch 10 is cured and has a layer of chemical cure base gum which may be molded or laminated to the patch.” (*Id.*, 4:18-31.) “When it is desired

to apply the patch 10 to the inner surface 32 of the tire 11, a chemical cement-like vulcanizing material is added to the base cushion gum layer 13 and the patch applied to the inner surface of the tire.” (*Id.*, 4:21-25.) “The curing of the chemical cure base gum will take place at room temperature” (*Id.*, 4:25-27.)

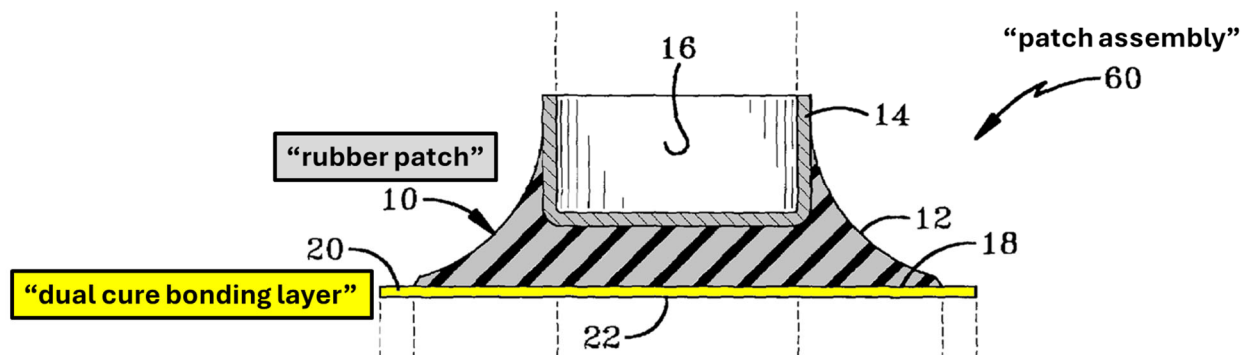
96. I rely on DiRocco as a secondary reference for **Ground 2**.

B. Ground 1: Claims 1, 5, 7-9, 11-13, 15-22 are rendered obvious by Wilson

1. Independent claim 1

(a) Preamble: “An assembly for attachment with a vulcanized rubber article comprising:”

97. In my opinion, to the extent the preamble is limiting, it is disclosed by Wilson. The title of Wilson is “Electronic monitoring device and *patch assembly*.” The patch assembly includes a rubber patch with an attached dual cure bonding layer (Wilson, 3:35-42, 4:1-10):

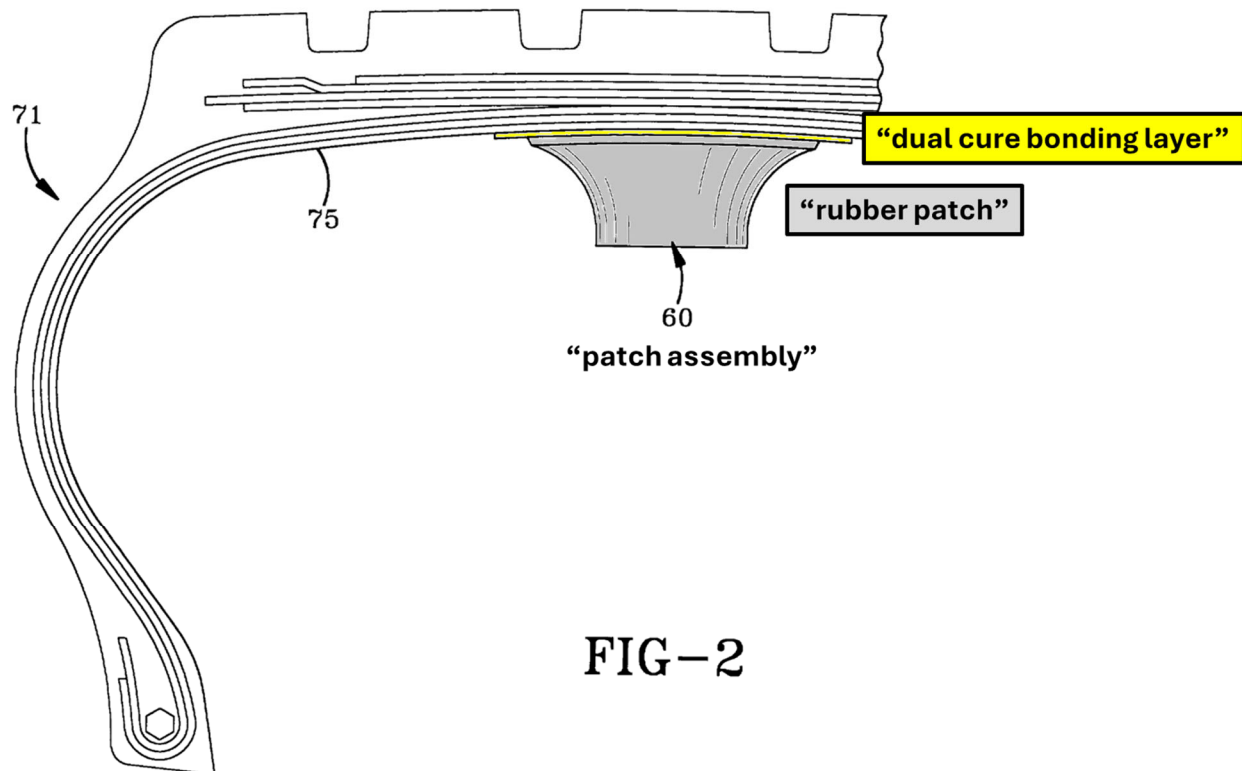


(Wilson, Fig. 1 (excerpted and annotated).)

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98. The patch assembly disclosed in Wilson is the claimed “**assembly**.”

99. Figure 2 of Wilson discloses a patch assembly “assembled to the innerliner 75 of tire 71.” (Wilson, 4:26-27):



(Wilson, Fig. 2 (annotated).)

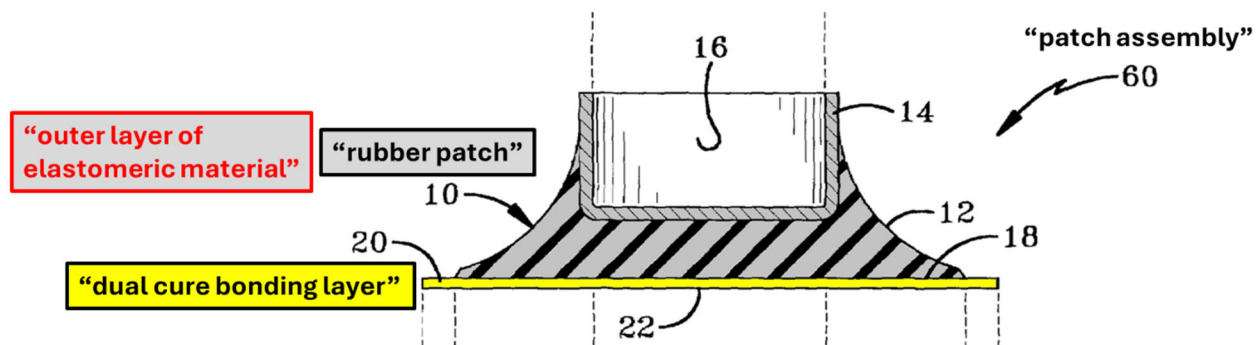
100. Wilson further discloses that “[i]n a preferred embodiment, the rubber patch is vulcanized and then assembled to *the vulcanized tire*.” (Wilson, 3:42-44 (emphasis added); *see also id.*, 3:44-48 (“assembling the vulcanized rubber patch to the vulcanized tire”), *id.*, 4:29-32 (“The patch assembly is then stitched to the innerliner of the vulcanized tire”), *id.*, 4:1-25 (“The dual cure bonding layer

may be any material which can be activated and cured to the *vulcanized rubber of the tire* innerliner and vulcanized patch.”) (emphasis added).) Thus, Wilson discloses “[a]n assembly for attachment with a vulcanized rubber article.”

(b) **Limitation 1[a]: “an outer layer of elastomeric material having a visual feature; and”**

101. In my opinion, Wilson discloses this limitation.

102. The vulcanized rubber patch of Wilson’s patch assembly is the claimed “outer layer of elastomeric material”:



(Wilson, Fig. 1 (annotated); *see also id.*, 3:35-37 (“FIG. 1 shows a rubber patch 10 of the present invention.”); 3:42-44 (“the rubber patch is vulcanized”); 3:46-48 (“the vulcanized rubber patch”); 4:1-3 (“the vulcanized tire patch”); 4:16-19 (“the vulcanized patch”); 3:55-60 (describing “curing of the patch for further assembly”).)

103. Wilson discloses that a dual cure bonding layer is affixed to the second side of the rubber patch. (Wilson, 4:1-3.) Wilson’s rubber patch thus satisfies Patent Owner’s proposed construction for “layer” (at least one material disposed over).

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Wilson's rubber patch is also "outermost" and thereby satisfies Patent Owner's proposed construction for "outer layer" (at least one layer that is outermost). Thus, Wilson's rubber patch is an "**outer layer**."

104. The rubber of Wilson's rubber patch is an "**elastomeric material**." (See Wilson, 3:48-55 ("[T]he patch may be a rubber selected from the group consisting of Ethylene Propylene Diene Monomer (EPDM) rubber, butyl rubber, natural rubber, neoprene and mixtures thereof. One preferred embodiment is a mixture of chlorobutyl rubber and natural rubber. Another preferred embodiment is a mixture of Styrene-Butadiene rubber (SBR) and natural rubber.").) The '027 patent confirms that the vulcanized rubbers of Wilson's rubber patch are "**elastomeric materials**." ('027 patent, 5:66-6:6 ("elastomeric materials useful for forming a display layer 22 include and are not limited to vulcanized rubber, natural rubber, SBR, nitrile rubber, neoprene rubber... and combinations thereof.").)

105. Turning now to the "**visual feature**" element of this limitation, I understand that PO has proposed a construction for this term in the parallel district court litigation: "at least one visual display or a feature that is visually or otherwise detectable." (EX1024, Ex. B at 12.) I understand that PO's proposed construction was meant to include the express disclosures in the specification of the '027 patent that describe visual features, such as: "a desired display indicia, which may be a

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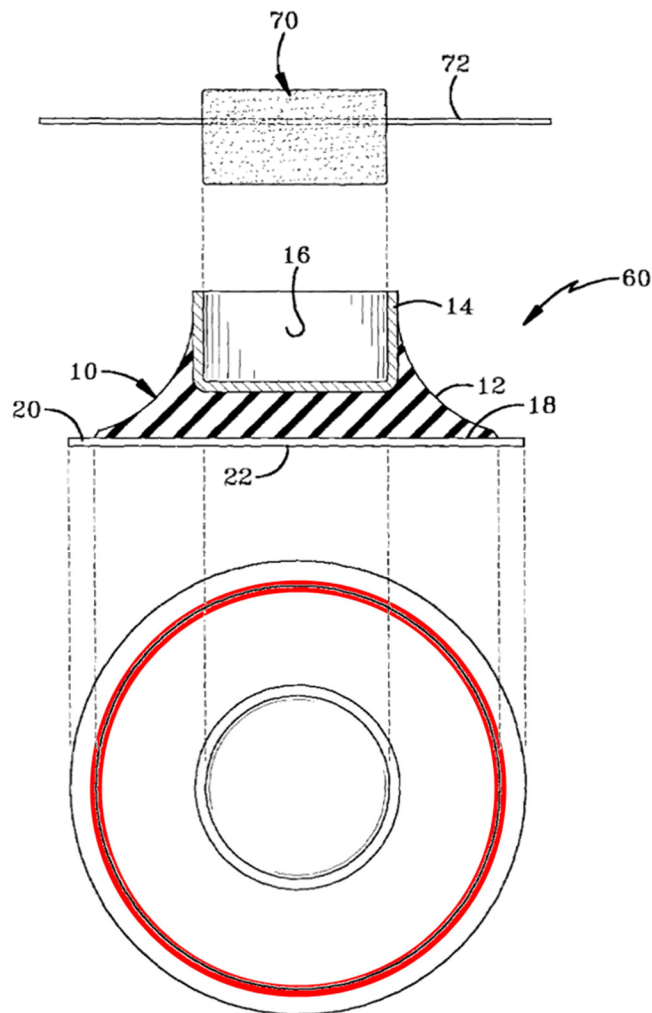
visual display or a feature that is visually or otherwise detectable” (’027 patent, 1:62-65); “the display layer may be constructed to have a desired color and/or pattern, and or shape, and/or texture useful to provide a desired display image or indicia or function” (*id.*, 4:63-66); “the display layer **22** is provided in the form of a single layer of elastomeric material that may be colored, and/or patterned, and/or textured as desired to provide a desired display image or indicia viewable on the outer surface” (*id.*, 5:62-66); “display assemblies may be configured to provide a desired display indicia or the like through the shape, design, configuration or the like of the one or more display layers” (*id.*, 12:35-37).

106. In my opinion, Wilson discloses obvious ways that the rubber patch can be configured with various “**visual feature[s]**” falling within PO’s construction. For example:

- Wilson’s rubber patch will have a shape, such as depicted in the Figures.

Exemplary Figure 1 below has a circular shape (red), which is a “**visual feature**” of the patch:

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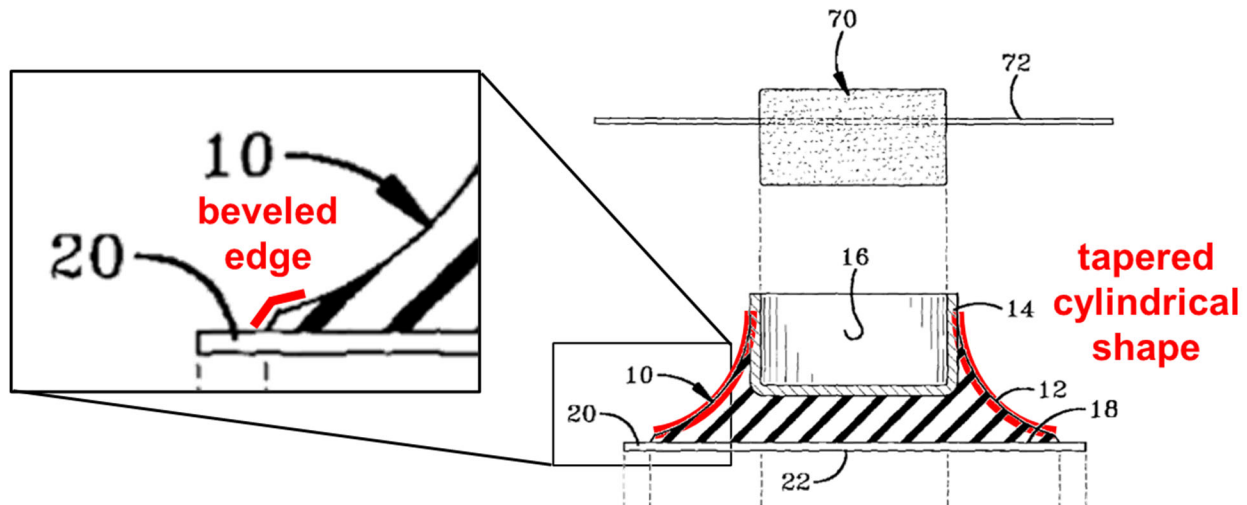


(Wilson, Fig. 1 (annotated).)

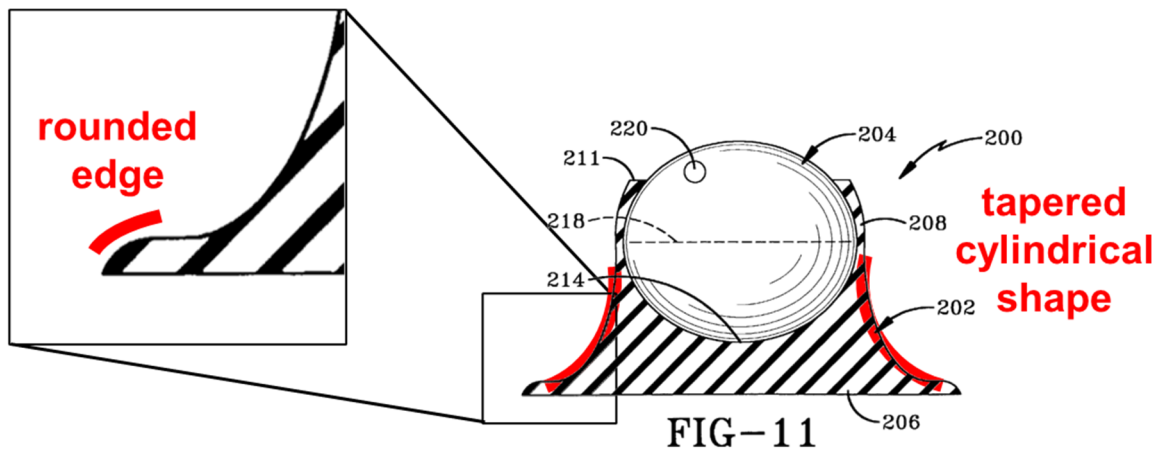
- The rubber material of the rubber patch will also have a color—it will not be clear and colorless—and the color is a “**visual feature.**”
- The disclosed rubber patch embodiments of Wilson have other visually detectable features, such as the tapered cylindrical shape and beveled or rounded edges of the embodiments depicted in Figure 1 and Figure 11

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(outlined in red below), which are also a “**visual feature**”:



(Wilson, Fig. 1 (annotated).)

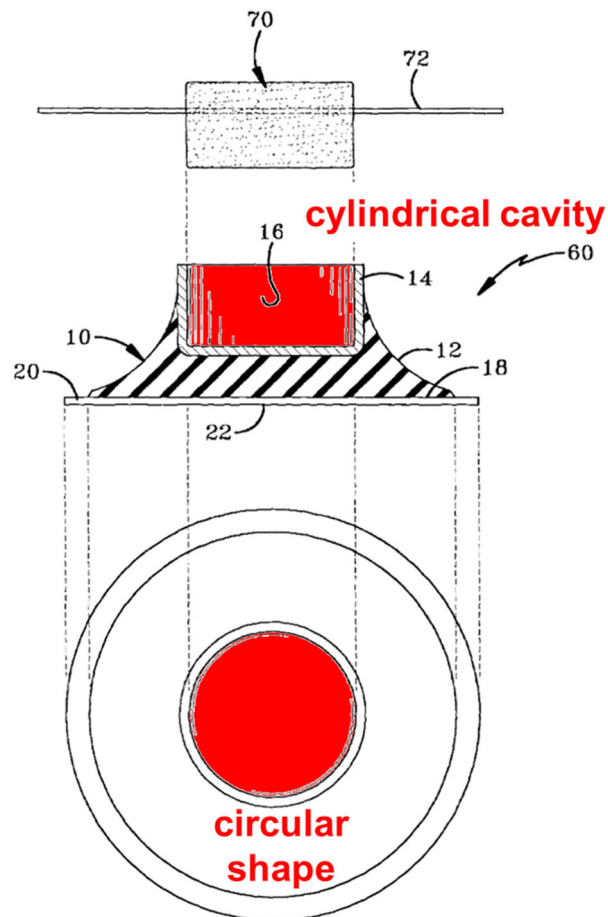


(Wilson, Fig. 11 (annotated); *see also id.*, 8:26-27 (“Patch 202 has rounded and curved walls and surfaces”).)

- The cavity for holding the electronic monitoring device within Wilson’s disclosed rubber patches is also a “**visual feature**” with a specific shape and which also visually indicates the location for placement of the electronic

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monitoring device and the complementary shape of the appropriate monitoring device for a given patch, for example, as depicted by the cylindrical cavity of Figure 1 and the annular round-bottom and oval-shaped cavity in the embodiment described in Figures 10-13:



(Wilson, Fig. 1 (annotated); *see also id.*, 3:35-41 (“a cavity 16 which is cylindrical, although the cavity 16 may be of any convenient configuration”).)

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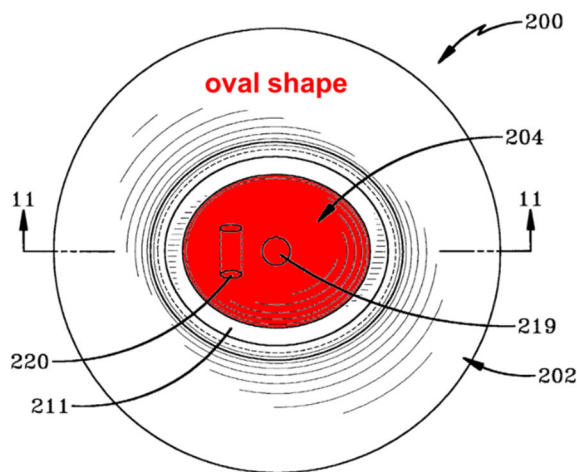


FIG-10

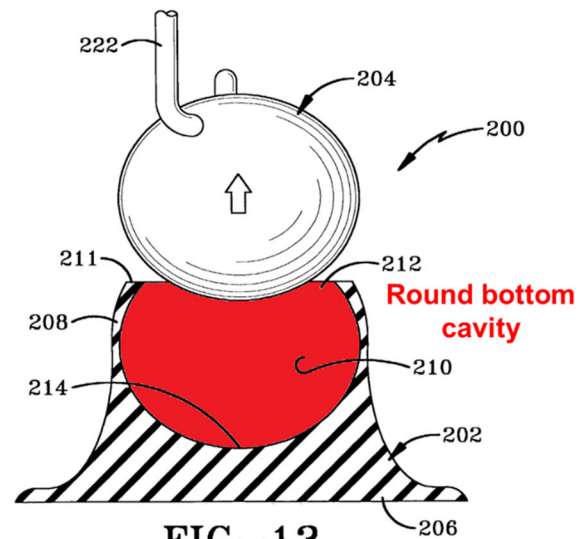


FIG-13

(Wilson, Figs. 10, 13 (annotated); *see also id.*, 7:15-16 (“Tube section **208** is annular and continuous and defines a cavity **210**”), 7:53-55 (“The inner surface **214** that defines cavity **210** may be curved to substantially match the outer curvature of monitoring device **204**”).)

- Wilson’s patch embodiment of Figure 9 illustrates other “**visual features**” that can be implemented onto the patch (including the patch embodiment of Figure 1) including, for example, slots 144 and ring 146 (red, below) configured to receive the tabs 132 (blue, below) on the monitoring device 130:

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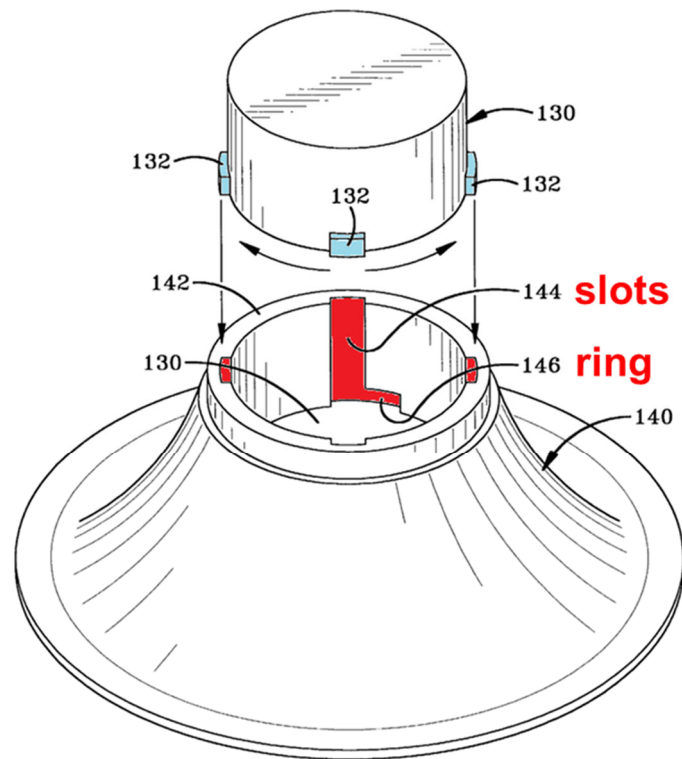


FIG-9

(Wilson, Fig. 9 (annotated); *see also id.*, 6:17-44.)

107. Wilson also discloses that the second side 18 of the patch 10 “is radiused to have about the same radius as the tire to which it is assembled, the radius being larger for larger tires.” (Wilson, 3:35-67.) The radius of the patch is a feature that is visually detectable. For example, the second side 18 of the patch 10 will have one radius for a pneumatic tire on a passenger car and will have another, larger, visually different radius for a large tire. Wilson also explains that “[f]or very large tires, such as for off-the-road tires, the radius may be eliminated altogether, so that

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there is no contour and the opposite side is flat, having no contour.” (*Id.*, 3:35-67.)

The varying contours is something that would be visually apparent. Thus, this feature in Wilson is a “**visual feature.**”

108. In formulating my opinions under this claim element, I have relied on elements from the patch 10 illustrated in Figure 1 of Wilson as well as elements from the various patches described and depicted in the other figures of Wilson. It is my opinion that it would have been obvious to implement the elements and features from any patch disclosed in Wilson into the patch assembly depicted Wilson’s Figure 1 and attached to a tire as depicted in Wilson’s Figure 2.

109. After reviewing Wilson, it is clear that the patch assembly 60 described in Figures 1 and 2 is the base assembly embodiment and all of the various configurations and embodiments of a suitable rubber patch can be easily used within that base patch assembly. All key features of a basic rubber patch are described in the Figures 1-2 embodiment—i.e., the material of the patch (vulcanized rubber), how it is assembled (with dual cure bonding layer 20 on its second side 18) into a patch assembly, and how it is attached to a tire. The other embodiments in Wilson, merely show different configurations of the patch so that it will be suitable to conform to a given monitoring device and provide additional and alternative functionality. It is therefore my opinion that any patch embodiments disclosed in Wilson is functionally

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identical and intended to be configured and attached to a tire in the same manner as patch 10 described for Figure 1. Of course, a POSA would have had a reasonable expectation of success in implementing any of the patches as part of Wilson's patch assembly. Doing so would not require any technical leap as it would only require application of the dual cure bonding layer onto any given patch.

- (c) **Limitation 1[b]: “[i] an adhesive layer adhered to an interface surface of the outer layer, [ii] wherein at least a portion of the outer layer adjacent the interface surface comprises a barrier material composition, and”**
 - (i) **Limitation 1[b][i]: “an adhesive layer adhered to an interface surface of the outer layer,”**

110. Wilson discloses this limitation. I understand that Patent Owner proposed that “**(an) adhesive layer**” means “at least one layer that bonds to, vulcanizes to, or otherwise adheres to,” (EX1024, Ex. B at 1-2) which I adopt for the purposes of my opinions in this proceeding.

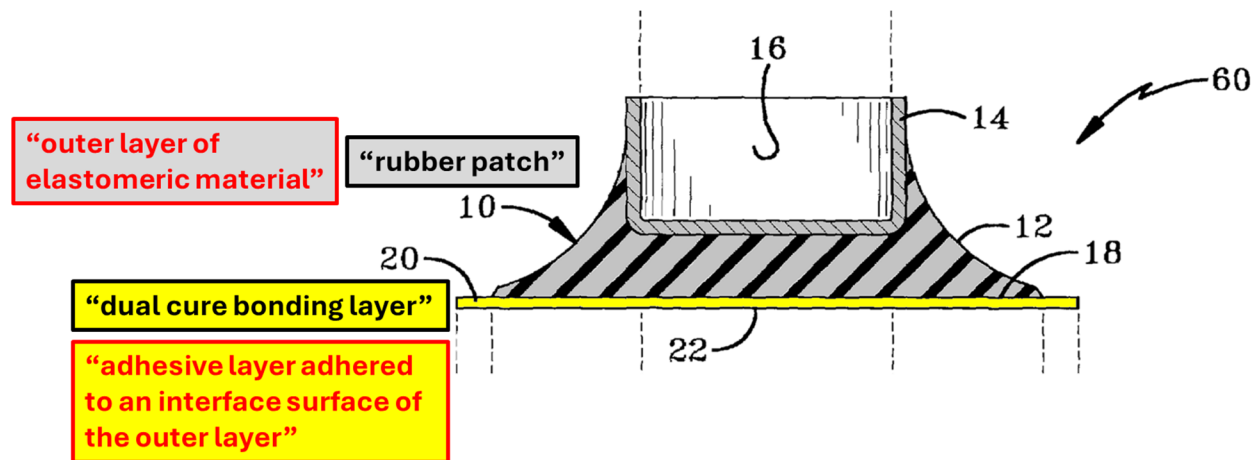
111. Wilson discloses that an “important feature of the dual cure bonding layer is that it can be chemically activated and cured, without the need for heating to an elevated temperature.” (Wilson, 4:1-25.) “The dual cure bonding layer may be any material which can be activated and cured to the vulcanized rubber of the tire innerliner and the vulcanized patch” but “preferably... is natural rubber.” (*Id.*; '027 patent, 6:59-7:20 (describing an adhesive layer as being “formed from a material

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capable of forming a chemically, heat-activated or otherwise permanent bonded attachment with [a] vulcanized rubber article”).) Wilson further discloses that the patch assembly is assembled to the inner liner of a tire by applying activating cement to the second side 22 of the dual cure bonding layer 20, stitching the patch assembly onto the innerliner of the tire, and allowing the patch assembly/tire assembly “to cure for a sufficient time and temperature *to form a strong bond between the tire and the tire patch.*” (Wilson, 4:26-32.) In my opinion, the dual cure bonding layer 20 in Wilson is the claimed “**adhesive layer**” under PO’s proposed construction because the dual cure bonding layer forms the strong bond between the tire and the tire patch.

112. Wilson discloses that dual cure bonding layer 20 is “[a]ffixed to the second side **18** of the vulcanized tire patch [10]” and “is permanently assembled to the patch to form patch assembly **60**” by “[a] non-curing cement (not shown) [that] is applied to side **18** of the patch in order to hold the dual cure bonding layer **20** onto the patch.” (Wilson, 4:1-10.) The second side 18 of the rubber patch is the claimed “**interface surface of the outer layer**” and by permanently assembling the dual cure bonding layer onto that interface with a non-curing cement, Wilson discloses “**an adhesive layer adhered to an interface surface of the outer layer,**” depicted as follows:

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(Wilson, Fig. 1 (excerpted and annotated).)

113. I further note that PO’s infringement contentions allege that a “cushion gum” layer is the claimed “adhesive layer.” (EX1025, 12.) This is exactly what the dual cure bonding layer 20 in Wilson is, as a POSA would plainly recognize. Thus, in in my opinion, Patent Owner could not argue the dual cure bonding layer 20 of Wilson is not an “adhesive layer” under its proposed construction without also necessarily excluding a cushion gum layer. Indeed, Wilson states that “[e]xemplary non-curing cement and an exemplary dual curing bonding layer are products of Patch Rubber Company” (Wilson, 4:1-37) and EX1020, a product catalog from the Patch Rubber Company from 2012, discloses that the dual cure material is “soft, high tack gum” that “chemically vulcanizes at room temperature or when heat and pressure are applied[.]” (EX1020, 3). An excerpt from EX1020 with this disclosure is reproduced below:

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► Dual Cure Repair Units	► Heat Cure Repair Units
Dual Cure Repair Units chemically vulcanize at room temperature or when heat and pressure are applied. Dual Cure Repair Units provide many benefits to the tire repairman: User Friendly Our soft, high tack gum is less prone to problems associated with moisture, handling and cement drying time, allowing easy application. Superior Green Tack Soft and tacky Dual Cure Base Gum "locks" the repair unit in place until a full cure has occurred. Optimal Adhesion Dual Cure Bonding Gum has over twice the adhesive strength of chemical cure repair units. Flexibility In Use Depending on your need, Dual Cure Repair Units will fully cure during the retreading process, in a section mold, or with the heat and pressure created by a tire in service. ► Cement Application Procedures Apply Dual Cure Repair Units with Fast-Dry Self-Vulcanizing Cement (see pg. 7).	Heat Cure Repair Units must be applied with direct heat and pressure. They will not chemically cure. Heat Cure Repair Units provide many benefits to the tire repairman: Maximum Adhesion When cured by heat and pressure, these repair units provide superior adhesion over chemically cured patches, and equivalent adhesion to uncured (green or raw) patches. A Permanent Repair During the curing process, the layer of Bonding Gum flows into imperfections in buffed surfaces acting as a "safety factor" for less-than-perfect application procedures. Because of increased adhesion to the tire casing, fewer units need to be removed prior to subsequent retreading cycles. Improved Appearance The heat cure repair units are cured at the factory which provides an improved appearance over uncured repairs. Repair Units feather into the tire innerliner, giving the repair an almost unnoticeable appearance. ► Cement Application Procedures Apply Heat Cure Repair Units with Black Brush Type Cement (see pg. 20) in curing systems which typically can vulcanize a totally uncured tire repair unit. (Section Mold - Autoclave: Curing temperatures 260° F and higher.) Apply with Fast-Dry Cement (see pg. 7) in curing systems which provide marginal heat conditions. (Repairing while retreading in molds and chambers.) Chamber curing at 210° F may not provide sufficient temperature for proper vulcanization unless standard curing time is increased.



Patch Rubber Company
A Moore Industries Company

(*Id.*) Therefore, in my opinion, if the accused “cushion gum” satisfies this limitation, then the dual cure bonding layer 20 in Wilson must satisfy it too.

- (i) **Limitation 1[b][ii]: “wherein at least a portion of the outer layer adjacent the interface surface comprises a barrier material composition, and”**

114. For purposes of this proceeding, I adopt PO’s proposed construction for “**barrier material composition,**” which is “material composition that has properties

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of shock absorbance, elastomeric expansion and/or contraction.” (EX1024, Ex. A at 3.) I note that PO’s proposed construction provides no quantified amount of shock absorption, elastomeric expansion and/or contraction that is necessary to satisfy its proposed construction. In my opinion, 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.

115. In this regard, the ’027 patent notes that the qualities of a “barrier material composition” are discussed with reference to an “intermediate or barrier layer **24**” (*see* ’027 patent, 6:11-58, 7:47-60, Fig. 2) and explains that “the intermediate layer is formed from an elastomeric material” (*id.*, 6:11-58). According to the ’027 patent, such “[e]lastomeric materials useful for forming the intermediate layer **24** include and are not limited to gum rubber, **vulcanized natural rubber SBR [i.e., NR/SBR]**, nitrile rubber, polyurethane, or comparable materials[.]” (*Id.*, 6:33-58 (emphasis added).)

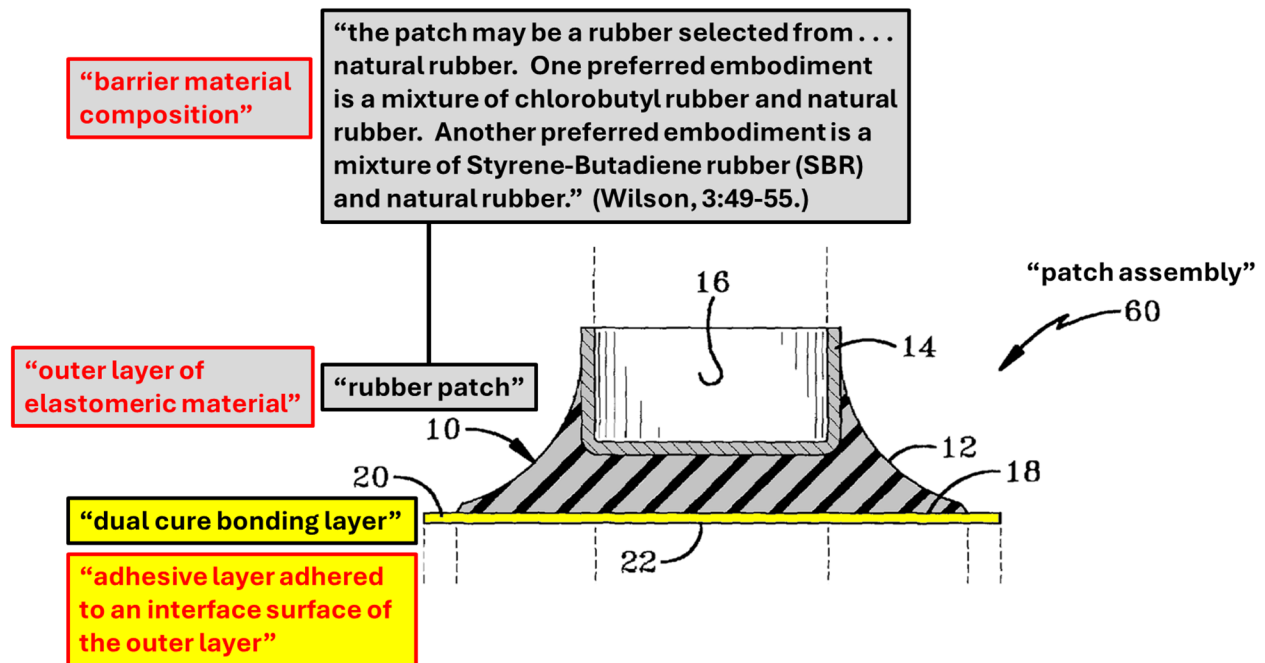
116. I further note that, PO further confirmed the inherent elastomeric properties of rubber that are known to a POSA in its infringement contentions, stating: “[c]omprised of rubber, the dock in the Accused Revvo Tire Sensor Products is elastomeric and **mitigates transmission of shock forces** from the tire to the

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housing when the dock retaining member is attached to the tire and the housing is attached to the dock retaining member.” (EX1025, 3 (emphasis added).)

117. In my opinion, under PO’s proposed construction, the disclosures in the ’027 patent, and PO’s admissions in its infringement contentions, Wilson’s rubber patch 10 is a **“barrier material composition.”** Wilson expressly discloses that “the patch may be a rubber selected from the group consisting of Ethylene Propylene Diene Monomer (EPDM) rubber, butyl rubber, natural rubber, neoprene and mixtures thereof. One preferred embodiment is a mixture of chlorobutyl rubber and natural rubber. Another preferred embodiment is a mixture of Styrene-Butadiene rubber (SBR) and natural rubber.” (Wilson, 3:49-55.) 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, depicted as follows:

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(Wilson, Fig. 1 (excerpted and annotated).)

118. Additionally, 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. As noted in the DeTrano reference discussed during prosecution of the '027 patent, “one preferred barrier layer **22** is composed of a blend of halobutyl rubber such as chlorobutyl rubber, and natural rubber.” (DeTrano, 4:28-30.) Thus, not only does Wilson’s disclosure of a mixture of chlorobutyl rubber and natural rubber as a preferred composition for use in the rubber patch satisfy PO’s proposed construction for “**barrier material composition**,” a POSA also would have known that a mixture of chlorobutyl rubber and natural rubber satisfies the plain meaning

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of **“barrier material composition.”**

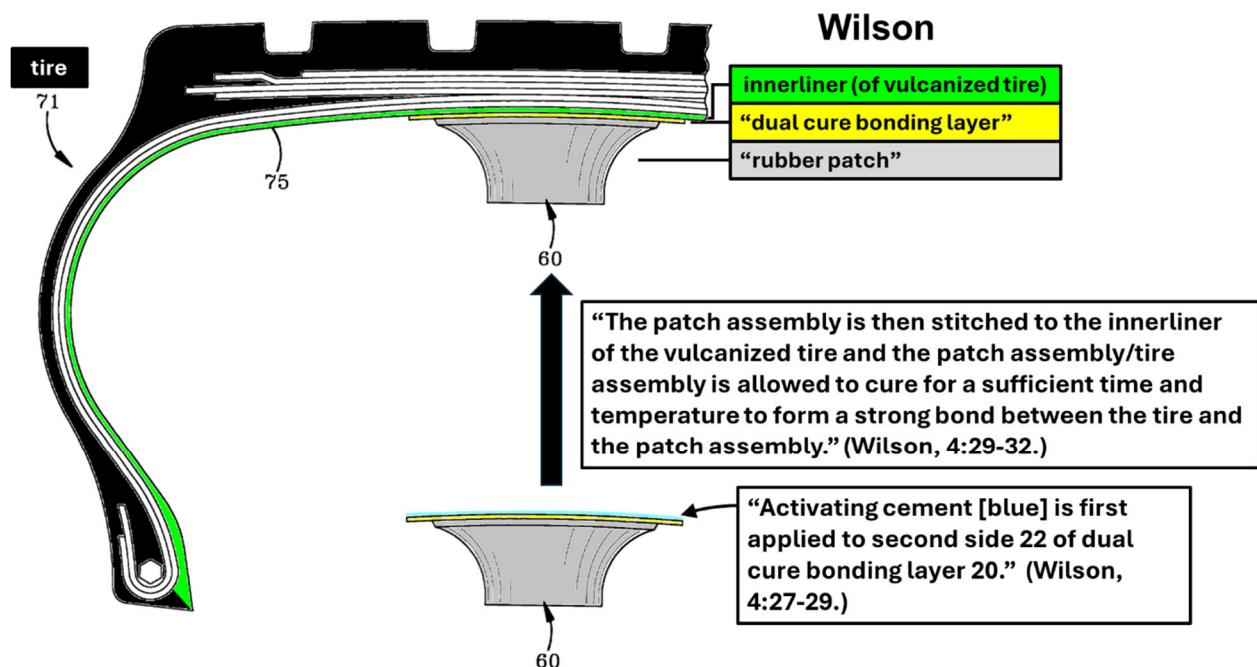
119. Addressing the **“at least a portion of the outer layer adjacent the interface surface”** portion of the limitation, it is my opinion that if the entire patch 10 in Wilson is constructed from the **“barrier material composition”** (i.e., rubber), then that portion **“adjacent the interface surface”** is also constructed from that composition (because all of it is) and therefore the claim language is satisfied. (*See* ’027 patent, 6:11-32; *see also* EX1025, 16-23 (pointing to the accused dock itself and not any particular part of it).)

(d) Limitation 1[c]: “wherein the adhesive layer is formed from a material capable of chemically bonding with a surface of a vulcanized rubber article.”

120. Wilson discloses this limitation. Wilson explains that “[t]he dual cure bonding layer may be any material which can be activated and cured to the vulcanized rubber of the tire innerliner and the vulcanized patch” but “[p]referably ... is natural rubber.” (Wilson, 4:16-20; *see also* ’027 patent, 6:59-7:20.) “The important feature of the dual cure bonding layer is that it can be **chemically activated and cured, without the need for heating to an elevated temperature.**” (Wilson, 4:15-15 (emphasis added).) To initiate chemical bonding, “[a]ctivating cement is first applied to second side **22** of dual cure bonding layer **20**. The patch assembly is then stitched to the innerliner of the vulcanized tire and the patch

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assembly/tire assembly is allowed to cure for a sufficient time and temperature to form a strong bond between the tire and the patch assembly” and that “[t]he process is diffusion controlled[.]” (Wilson, 4:15-37; *id.*, Fig. 2.)



(Wilson, Fig. 2 (annotated).)

121. Because Wilson describes the dual cure bonding layer as being “chemically activated and cured, without the need for heating” and is cured with “activating cement” in a “diffusion controlled” process, a POSA would have understood that Wilson is disclosing a process of chemically curing (or vulcanizing) the dual cure bonding layer to the tire. A POSA would have known that such a room-temperature, cement activated chemical curing process means that the

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Wilson's dual cure bonding layer would be capable of forming chemical bonds with the innerliner of the tire. Thus, the dual cure bonding layer 20 in Wilson **"is formed from a material capable of chemically bonding with a surface of a vulcanized rubber article."** (*See also* my opinions for limitation 1[b][i] above (under **Ground 1**).)

122. I also understand that, in its infringement contentions, PO admits that the accused "cushion gum" "is capable of being chemically bonded with the tire, such as with vulcanizing fluid." (EX1025, 20, 46.) As I discussed for limitation 1[b][i] above (under **Ground 1**), the dual cure bonding layer 20 in Wilson performs the same function in the same way as the accused "cushion gum." (*See* EX1025, 12, 30; Wilson, 4:1-25; EX1020, 3.) Therefore, in my opinion, if the accused "cushion gum" satisfies this limitation, then the dual cure bonding layer 20 in Wilson satisfies it too.

123. In my opinion, since all of the elements of claim 1 are disclosed by Wilson, claim 1 is invalid for obviousness.

2. Dependent claim 5

124. This claim depends from claim 1 and recites **"*wherein the barrier material composition impairs migration of a material constituent within the assembly when the assembly is attached to a vulcanized rubber article.*"** I note that

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claim 5 does 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.

125. The specification of the '027 patent provides no guidance for any quantification for how much **“the barrier material composition impairs migration”** or the nature or any “material constituents” whose migration need be impaired. Indeed, “impair” is never used in the specification. The specification likewise merely generically refers to “unwanted constituents,” not any and all **“material constituents”** such as those that may be *wanted* constituents. ('027 patent, 6:33-39 (“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**.”), 8:62-9:3 (“The presence of such an intermediate adhesive layer **50** in this second example operates to provide a greater degree of adhesion between the display layer **48** and the intermediate layer **44**, and may also

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operate to provide and extra degree of barrier protection against the migration of any unwanted constituents from the intermediate layer **44**, adhesive layer **46**, and/or the vulcanized rubber article that the display assembly is attached to.”), 9:11-16 (“The intermediate adhesive layer **50** is formed from a material capable of forming a bonded attachment between and underside surface of the display layer **48** and a surface of the intermediate barrier layer **44**, and optionally acting as a barrier to minimize or prevent the migration of any unwanted constituents into the display layer **48**.”).)

126. In my opinion and considering the breadth of the claim, Wilson discloses or at least renders this claim obvious. As I noted above with respect to claim limitation 1[b][ii], the rubber materials for Wilson’s rubber patch that interfaces with the adhered dual cure bonding layer is a “barrier material composition” because they are elastomeric with properties of shock absorbance, elastomeric expansion and/or contraction, including at least natural rubber and the preferred mixtures of either chlorobutyl rubber and natural rubber or SBR and natural rubber. Furthermore, as a physical, solid material, a POSA would have understood and found obvious that the rubber materials of Wilson’s rubber patch 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

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the patch is bonded to a vulcanized tire.

127. For example, particulate “material constituents” within the assembly would have their migration impaired within Wilson’s patch assembly by the rubber patch material after it was bonded to a tire, such as by impairing the migration of particulate matter from the dual cure bonding layer 17 through to the outer surface 12 of the rubber patch. Similarly, the rubber patch material would also necessarily serve to impede the flow of liquid materials within the patch assembly at least by acting as a diffusion barrier, such that it would impair the migration of chemical constituents that may be present in the tire or dual cure bonding layer from reaching outer surface 12 of the patch assembly.

128. Additionally, the patch 10 in Wilson “may be a rubber selected from ... a mixture of chlorobutyl rubber and natural rubber.” (Wilson, 3:35-67.) This rubber mixture was known in the art as having the barrier material composition properties recited in claim 5. For example, DeTrano discloses a tire patch with the identical preferred “barrier layer” that is “composed of a blend of halobutyl rubber such as chlorobutyl rubber, and natural rubber.” (DeTrano, 4:28-30.) DeTrano explains that “[t]he purpose of barrier layer **22** is to prevent certain ingredients in tire **10**, such as antioxidants, from reaching and discoloring visible layer **21**.” (DeTrano, 4:25-28.) Preventing certain ingredients present in the tire from passing through the barrier

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layer to an outer layer demonstrates that the mixture of chlorobutyl rubber and natural rubber is a **“barrier material composition [that] impairs migration of a material constituent within the assembly when the assembly is attached to a vulcanized rubber article.”** I further note that DeTrano and Wilson have common assignees – Bridgestone Corp. and DeTrano issued in 1994, more than 10 years before Wilson and 20 years before the ’027 patent, such that the barrier properties of a rubber mixture of chlorobutyl rubber and natural rubber would have been well established and well known to a POSA at the time of the ’027 patent.

129. Furthermore, in its infringement contentions, PO admits that “[a]fter the Revvo dock assembly ... is attached to the tire with vulcanizing fluid, the dock acts as a barrier to minimize or prevent or impair the migration of any unwanted constituents of the cushion gum and/or tire that may otherwise operate to damage or degrade the dock, as the dock and the cushion gum are made of different materials[.]” (EX1025, 55-56 (emphasis added); *see also id.*, 34.) Likewise, in Wilson, the patch 10 and the dual cure bonding layer 20 in Wilson are also made from different materials. (*See* Wilson, 3:35-67 (“the patch may be a rubber selected from ... a mixture of chlorobutyl rubber and natural rubber ... [or] ... Styrene-Butadiene rubber (SBR) and natural rubber,” i.e., SBR/NR), 4:1-25 (“Preferably ... the dual cure bonding rubber is natural rubber” and a “product[] of Patch Rubber

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Company”); *see also* my opinions for limitation 1[b][i] under **Ground 1** related to the dual cure bonding layer 20 and the Patch Rubber Company disclosures.)

130. 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. (*See also* ’027 patent, 6:33-58 (explaining that “vulcanized natural rubber SBR [i.e., NR/SBR]” is a “barrier material composition” with the claimed properties).)

131. The infringement contentions also mention the use of “vulcanizing fluid” to attach the accused dock to the tire. (EX1025, 55-56.) This is the same type of fluid described in both the ’027 patent and Wilson to attach their respective patches to a tire. (*See* ’027 patent, 6:59-7:35 (“[T]he adhesive layer may be formed from a material capable of forming the desired chemical bond or being vulcanized thereto ambient temperature conditions, e.g., by chemical reaction instead of being heat activated. Such materials include but are not limited to chemical cements common in retread applications, cyanoacrylate, epoxies, rubber-based acrylic pressure sensitive adhesives and combinations thereof.”) (emphasis added); Wilson, 4:26-37 (“Activating cement is first applied to second side **22** of dual cure bonding

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layer **20**” and “allowed to cure for a sufficient time and temperature to form a strong bond between the tire and the patch assembly.”) (emphasis added), 4:1-25 (describing the dual cure layer 20 as being “**chemically activated** and cured, without the need for heating to an elevated temperature”) (emphasis added).)

132. 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.

133. Based on the foregoing, it is my opinion that claim 5 is rendered obvious by Wilson.

3. Dependent claim 7

134. This claim depends from claim 1 and recites “***further comprising a cavity disposed therein.***” The patch assemblies in Wilson each include a cavity configured to hold a monitoring device/tag assembly, as shown for example by the cylindrical cavity depicted in Figure 1:

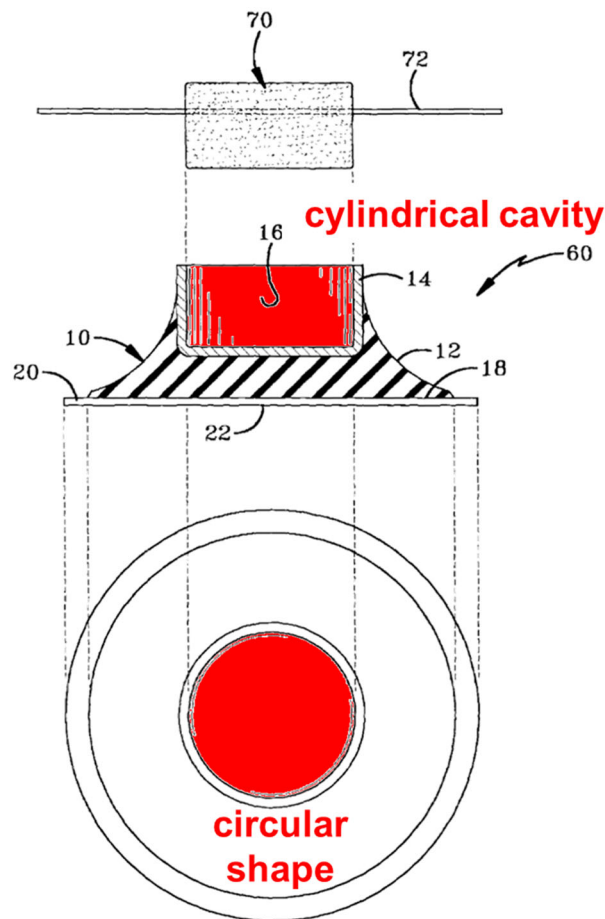


FIG-1

(Wilson, Fig. 1 (annotated); *see also id.*, 3:35-41 (“a cavity 16 which is cylindrical, although the cavity 16 may be of any convenient configuration”).)

135. Cavities are also depicted and described with respect to the patches depicted in Figures 6-13 in Wilson. (Wilson, Fig. 6 (5:9-11 (cavity 16)); Fig. 7 (5:37-39 (cavity 16)), Fig. 8, Fig. 9 (6:17-44), Figs. 10-13 (7:53-55 (cavity 210))).)

136. Thus, in my opinion, claim 7 is obvious in view of Wilson.

4. Dependent claim 8

137. This claim depends from claim 7 and recites “***further comprising an element disposed within the cavity.***” The entire thrust of Wilson is to provide a “patch assembly [that] includes a patch that removably and re-attachably holds the monitoring device.” (See Wilson, Abstract; *see also id.*, 1:20-25 (“The invention generally relates to mounting arrangements for electronic monitoring devices and, more particularly, to an electronic monitoring device and patch assembly wherein the electronic monitoring device is removably attached to the patch so that the electronic monitoring device may be repeatedly removed from and reattached to the patch.”).) To accomplish this, Wilson discloses that a monitoring device (e.g., tag assembly 70) “may be of any configuration which allows it to easily fit within the contour of the cavity 16” of the patch 10. (Wilson, 5:7-24; *see generally id.*, Abstract, Figs. 1, 6, 9-15 and related descriptions.) For example, Figures 6-8 depict various embodiments wherein a monitoring device/tag assembly 70 or 110 (highlighted blue) is disposed within the cavity of a patch and attached thereto—i.e., “**an element disposed within the cavity**”:

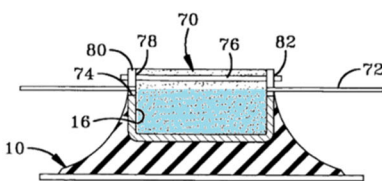


FIG-6

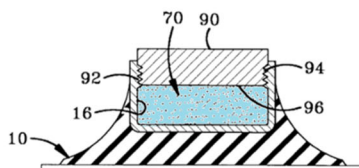


FIG-7

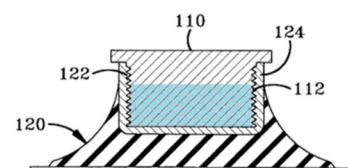
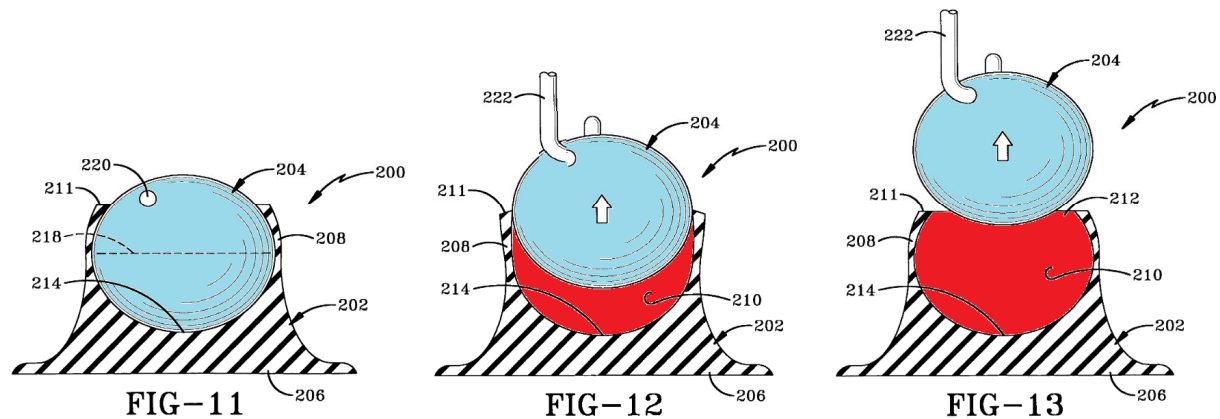


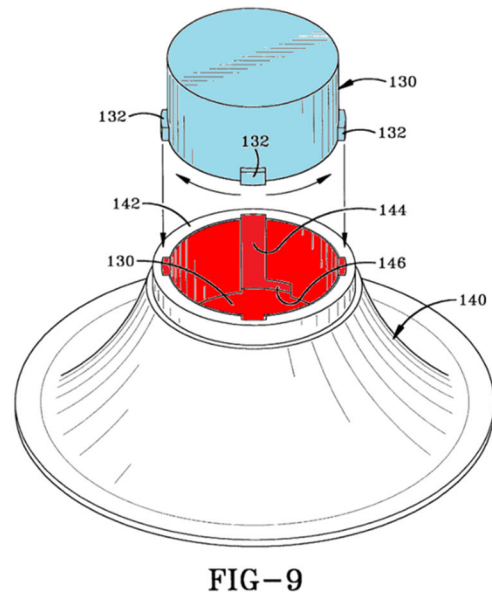
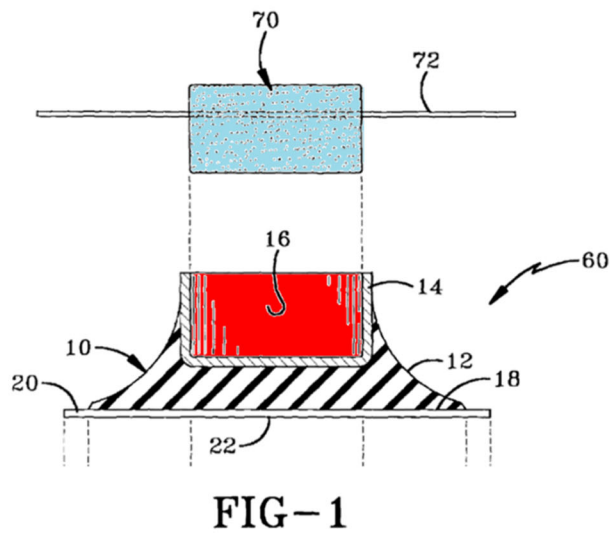
FIG-8

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138. Figure 11 shows an electronic monitoring device/tag assembly 204 (highlighted blue) disposed in cavity 210 (highlighted red) of patch 202 and Figures 12-13 shows the element being removed from the cavity of the patch, as follows:



139. Figure 1 of Wilson shows how the electronic monitoring device/tag assembly 70 is designed to be removably and re-attachably held within cavity 16 (Wilson, Fig. 1, 5:7-9) and a similar element 130 is illustrated and described for placement within the cavity of Figure 9 (*id.*, 6:17-20):



140. Accordingly, Wilson discloses and renders obvious claim 8.

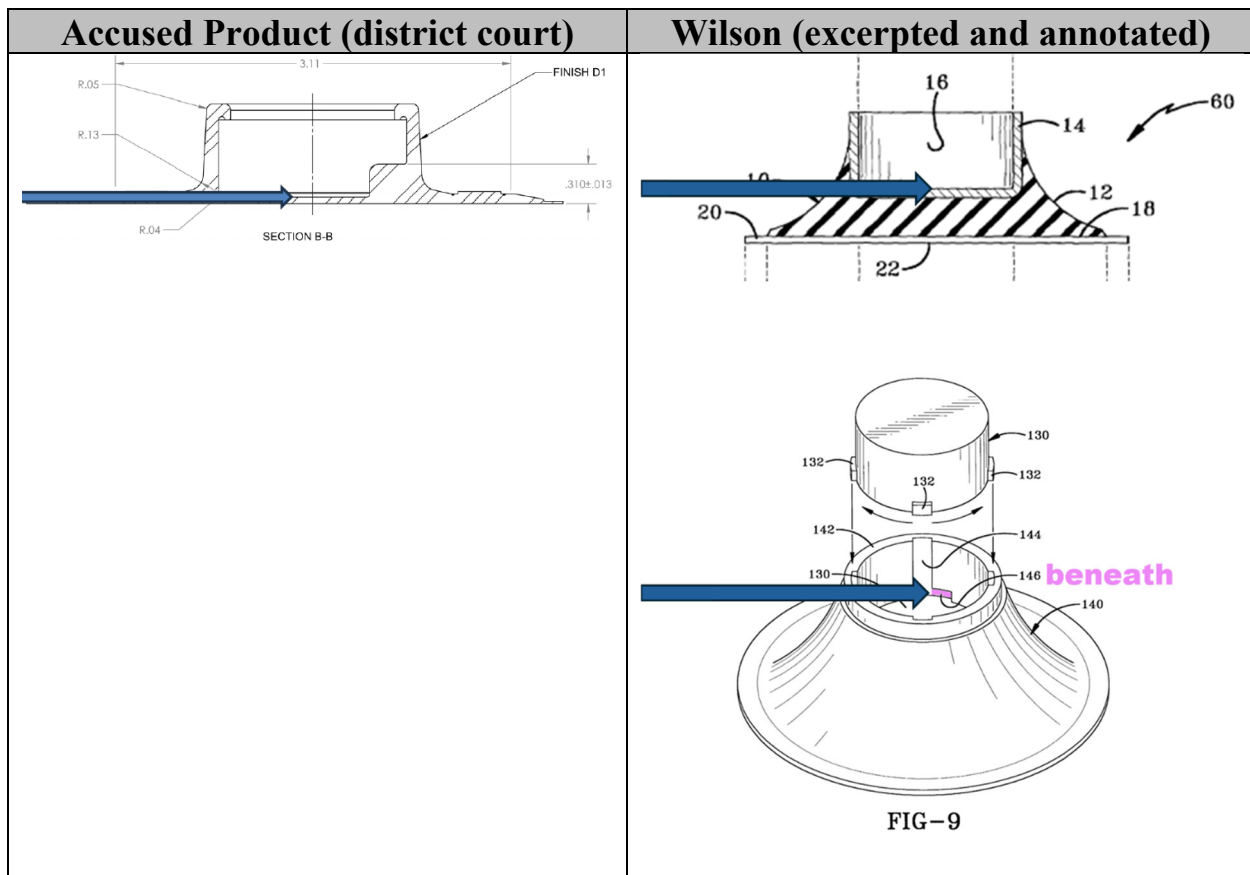
5. Dependent claim 9

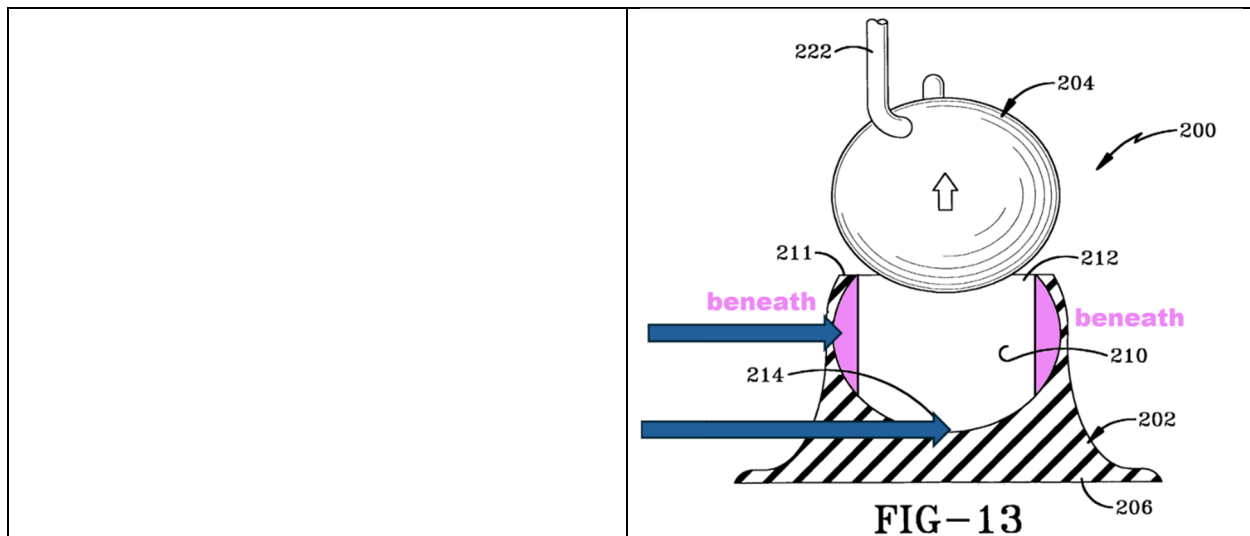
141. This claim depends from claim 7 and recites “*wherein the cavity is disposed beneath the outer layer.*” In its infringement contentions, PO takes the position that this limitation is satisfied if the cavity extends below the uppermost surface of the accused dock. (EX1025, 79-82.) Without agreeing to the legitimacy of that position, and for purposes of this proceeding only, I have been asked by counsel to adopt PO’s interpretation and apply it here.

142. The accused dock in the litigation and Wilson’s patches here have very similar configurations, as shown below in a side-by-side comparison. (EX1025, 82; Wilson, FIG. 1 (excerpted and annotated).) Like the accused dock, Wilson’s cavity

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16 extends below the uppermost surface of the patch assembly 10. In my opinion, if the accused dock satisfy this claim, it follows that the disclosures in Wilson likewise satisfies it as well (as identified by the same blue arrows applied to Wilson as applied in PO's infringement contentions).





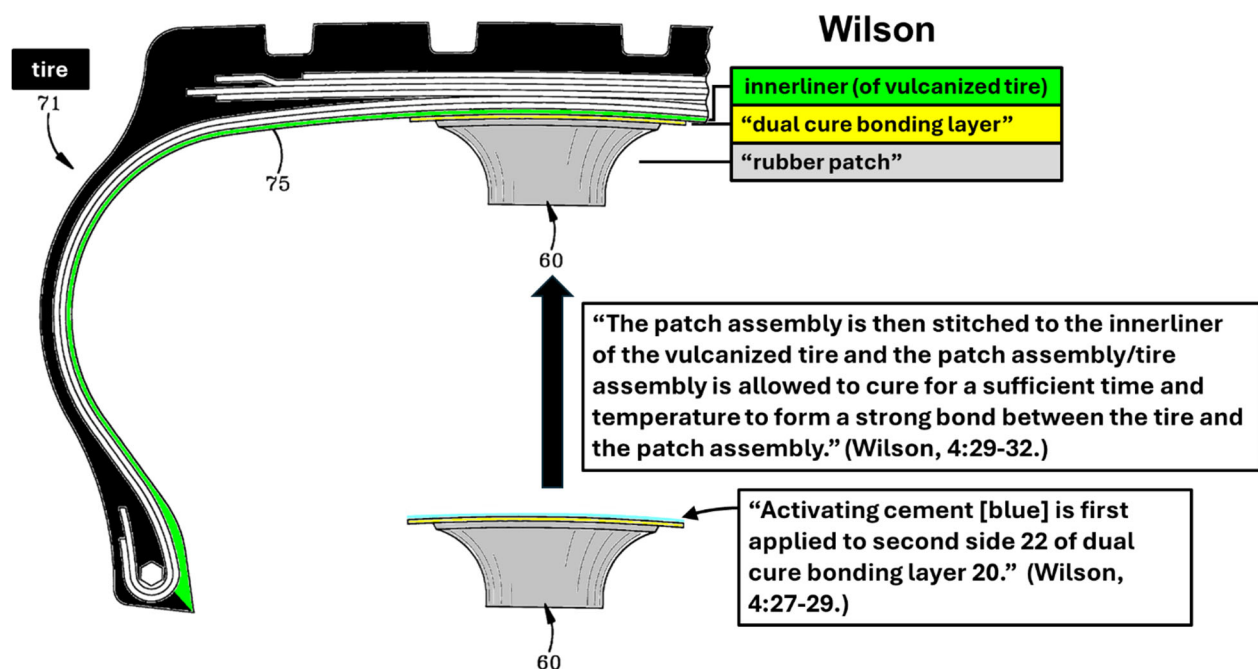
6. Independent claim 11

- (a) **Preamble: “A method for attaching an assembly to a surface of a vulcanized rubber article comprising the steps of:” (11[pre])**

143. In my opinion, to the extent this preamble is limiting, it is disclosed by Wilson. Wilson discloses that “the rubber patch is vulcanized and then assembled to the vulcanized tire.” (Wilson, 3:42-44.) Wilson discloses that the vulcanized rubber patch is assembled to the vulcanized tire after the vulcanized patch is formed into a “patch assembly,” wherein a dual cure bonding layer is affixed onto the patch. (See Wilson, 4:1-8 (“Affixed to the second side **18** of the vulcanized tire patch is a dual cure bonding layer **20**, which has a first side (not shown) and a second side **22**. This dual cure bonding layer may be assembled to the patch at any time following vulcanization of the patch and prior to assembly of the patch assembly to the tire innerliner. *The dual cure bonding layer is permanently assembled to the patch to*

form patch assembly 60.”) (emphasis added).)

144. Wilson further discloses that after the “patch assembly 60” has been constructed, it “is then assembled to the innerliner 75 of tire 71” (Wilson, 4:26-27) using an “[a]ctivating cement [that] is first applied to the second side 22 of dual cure bonding layer 20” and the patch is “stitched to the inner liner of the vulcanized tire and the patch assembly/tire assembly is allowed to cure for a sufficient time and temperature to form a strong bond between the tire and the patch assembly” (Wilson, 4:26-32), depicted as follows:

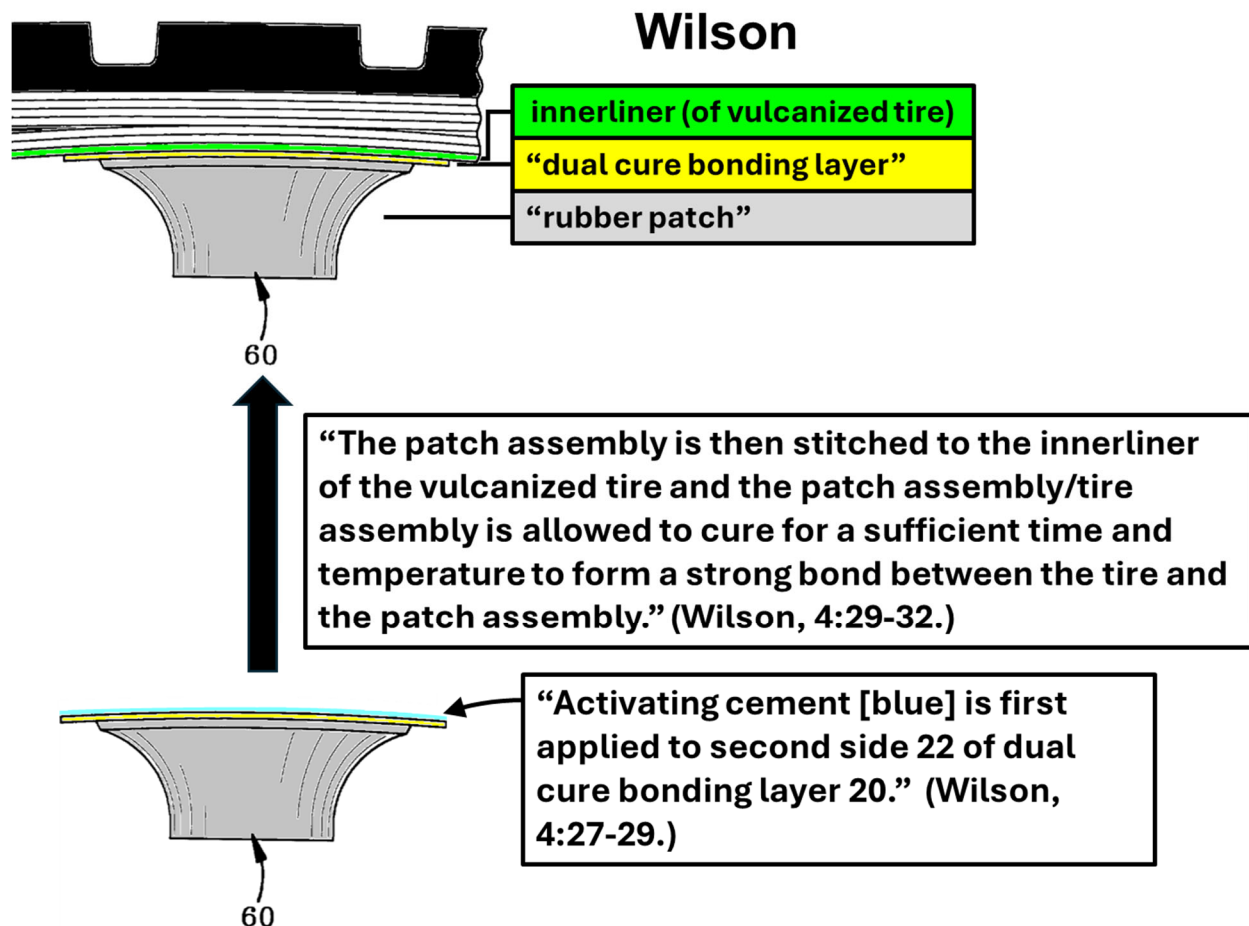


145. Accordingly, in my opinion, Wilson discloses “[a] method for attaching an assembly to a surface of a vulcanized rubber article.” See also my opinions for claim 1[pre] above.

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(b) Limitation 11[a]: “identifying a surface of a vulcanized rubber article;”

146. Wilson discloses that the “patch assembly” is “assembled to the innerliner **75** of [the] tire **71**.” (Wilson, 4:26-27; *see also* Wilson, 3:60-61 (“The second side **18** of the patch **10** approximates the contour of an innerliner of a tire.”).) Thus, Wilson “**identif[ies] a surface of [the] vulcanized rubber article**” as the surface of the innerliner of the vulcanized tire. Between applying the activating cement and stitching the patch to the inner liner, it is understood that a location on the surface of the innerliner of the vulcanized tire must be identified for attachment of the patch assembly. Figure 2 of Wilson (excerpted and annotated below) shows the placement of the patch assembly 60 onto the surface of the innerliner 75 (highlighted green) of the tire (black):



147. Additionally, in my opinion, identifying a surface is necessarily a prerequisite for attaching a patch to a tire. This step is realized when the patch assembly 60 in Wilson is placed on the vulcanized rubber tire innerliner surface where it is stitched into the location where it will be cured. Notably, in its infringement contentions, PO points to a single image of the accused dock already attached to a tire as evidence that this limitation is satisfied. (See EX1025, 86.) A similar image is shown in Figure 2 of Wilson (*see above*).

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148. Thus, in my opinion, Wilson discloses this step of claim 11.

(c) **Limitation 11[b]: “placing an assembly into contact with the identified surface, wherein the assembly comprises:”**

149. As shown above, Figure 2 of Wilson discloses that the patch assembly has been “**plac[ed]... into contact with the identified surface**” of the innerliner of the vulcanized tire. The act of “**placing**” occurs after the activating cement is applied to the patch assembly 60 and before the assembly is stitched to the innerliner of the tire. (See Wilson, 4:26-37.)

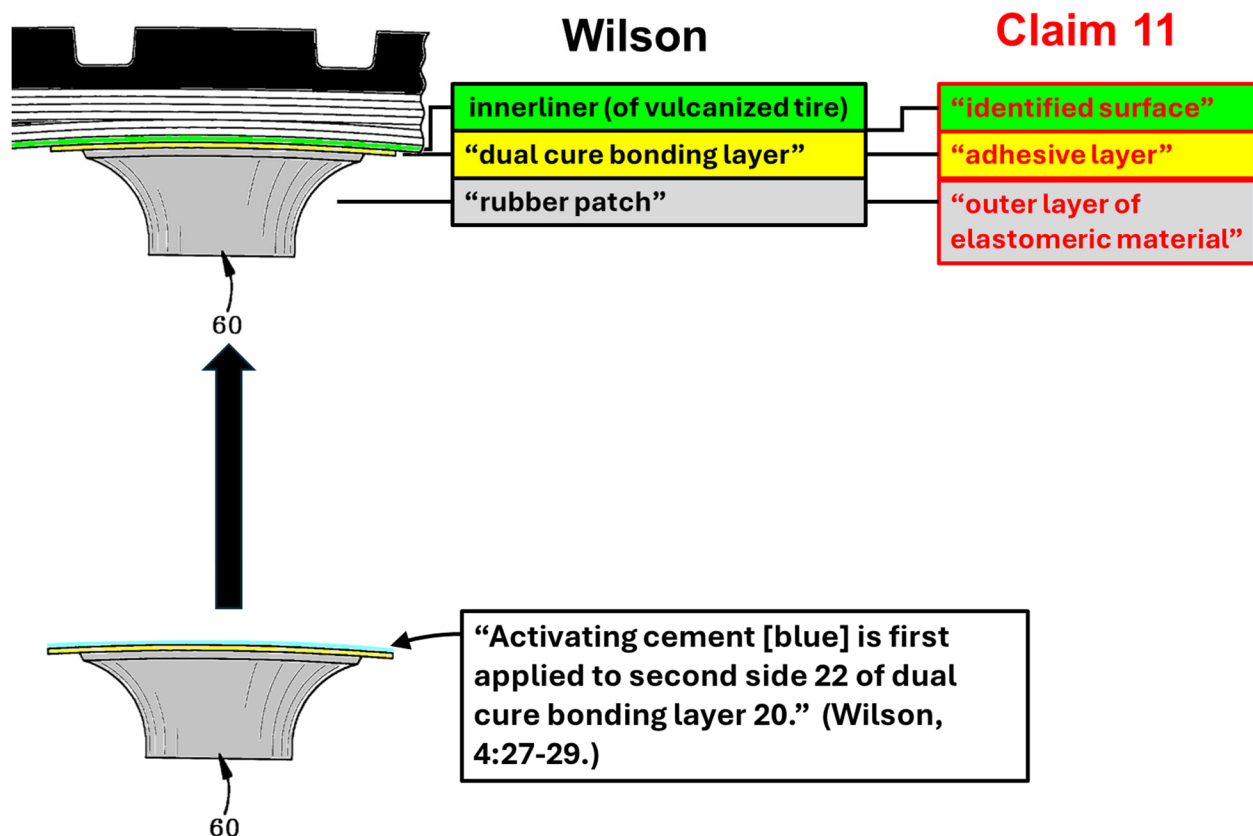
150. Accordingly, Wilson discloses this step of claim 11.

(d) **Limitation 11[c]: “an outer layer of elastomeric material, wherein the outer layer is in contact with an adhesive layer interposed between the identified surface and the assembly that bonds the assembly to the vulcanized rubber article, and”**

151. In my opinion, this limitation is disclosed by Wilson for many of the same reasons already discussed for claim 1 under **Ground 1**. For example, as I discussed above for limitation 1[a] (under **Ground 1**), the vulcanized rubber patch 10 in Wilson is the claimed “**outer layer of elastomeric material.**” (Wilson, 3:48-55; ’027 patent, 5:66-6:6.) As I discussed for limitation 1[b] (under **Ground 1**), the dual cure bonding layer 20 is the claimed “**adhesive layer**” and is “**in contact with**” the patch 10 (“**outer layer**”). (Wilson, 4:1-37; ’027 patent, 6:59-7:20; EX1025, 12;

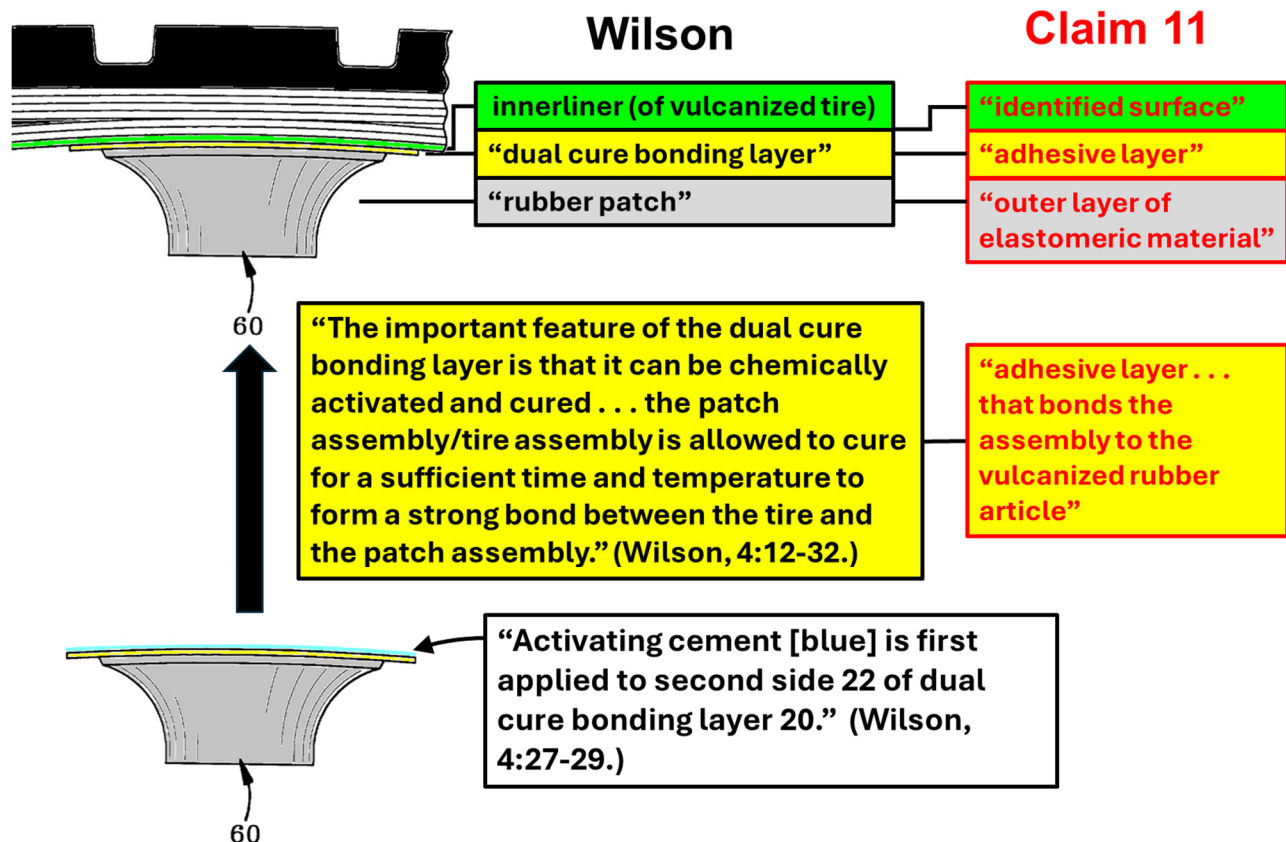
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EX1020, 3.) This is also illustrated in Wilson's Figure 1. As also shown below in an excerpted and annotated version of Figure 2 of Wilson, the dual cure bonding layer 20 (highlighted yellow) and/or applied "activating cement" (highlighted blue, an alternative "adhesive layer") is **"interposed between the identified surface [highlighted green] and the assembly."**



(See '027 patent, 7:24-30 ("[T]he adhesive layer may be formed from a material capable of forming the desired chemical bond or being vulcanized thereto ambient temperature conditions, e.g., by chemical reaction instead of being heat activated. Such materials include but are not limited to chemical cements[.]").)

152. As discussed for limitation 1[c] (under **Ground 1**) and depicted below, the dual cure bonding layer 20 “**bonds the assembly [i.e., patch 10] to the vulcanized rubber article [i.e., tire].**” (Wilson, 4:26-37, Fig. 2.)



153. Thus, in my opinion, Wilson discloses claim element 11[c]

- (e) **Limitation 11[d]: “wherein the outer layer comprises a barrier material composition to mitigate migration of material from the vulcanized rubber article.”**

154. As I previously noted, Wilson discloses that the vulcanized rubber patch can be made of natural rubber (NR), a mixture of chlorobutyl rubber and

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natural rubber, and a mixture of Styrene-Butadiene rubber and natural rubber (*see* Wilson, 3:42-60) and that each of these materials are a “**barrier material composition**” under PO’s proposed construction and infringement contentions that such rubber compositions allegedly satisfy this claim element 11[d]. (*See* EX1025, 34, 55-56, 101-103 (“the dock acts as a barrier ... as the dock and the cushion gum are made of different materials”); Wilson, 3:35-4:25 (where the patch 10 and the dual cure bonding layer 20 are of different materials).) Therefore, in my opinion, this limitation is disclosed and rendered obvious by Wilson for the same reasons I discussed for limitation 1[b] and dependent claim 5 under **Ground 1**, such as by the rubber patch material acting as a physical barrier to particulate material, as a diffusional barrier to chemical constituents, or in particular for Wilson’s rubber patch made of a mixture of chlorobutyl rubber and natural rubber by blocking active oxidants, that may be released from or present in the tire. Although I note that the language in limitation 11[d] is slightly different than the language of claim 5, the concept is the same: a barrier material composition that mitigates migration of material through the patch assembly from the tire.

155. Accordingly, in my opinion, Wilson discloses and/or renders obvious all elements of claim 11 and the claim should therefore be found invalid for obviousness.

7. Dependent claim 12

156. This claim depends from claim 11 and recites “*further comprising preparing the identified surface before the step of placing.*” In my opinion, this claim is rendered obvious by Wilson. It was standard practice in the industry at the time of the ’027 patent to prepare a tire surface before placing a patch. For example, a POSA would have understood that dust or particulate matter on the innerliner of the tire would detrimentally impact the bonding between a rubber patch and a POSA would have found it obvious to remove such material from the innerliner before applying Wilson’s patch assembly to it. Removing such dust or particulate material from the surface of the innerliner would have been an obvious step of “*preparing the identified surface before the step of placing*” Wilson’s rubber patch onto the innerliner.

157. Indeed, it was a well-known, common, and standard practice within the art to “clean” and “buff” the innerliner surface before attaching a tire patch to the innerliner of a tire, as this would result in a stronger bond between the patch and the tire. (See, e.g., DiRocco, 4:3-9 (“The application of the patch **10** to the tire **11** follows the procedure well known to those skilled in the art wherein an inner surface **32** of the tire **10** around the injury **12** is cleaned and buffed.”) (emphasis added); DeTrano, 7:44-55 (“[t]he surfaces to be bonded may then be buffed to RMA1 or

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RMA2 Standard Buffing Textures”), claim 8.)

158. Although Wilson does not expressly disclose such preparation of the innerliner, it discloses that “[e]xemplary non-curing cement and an exemplary dual cure bonding layer are products of Patch Rubber Company.” (Wilson, 4:10-12.) In this regard, the 2012 product catalog for Patch Rubber Company identifies “Dual Cure Repair Units” having a “Dual Cure Base Gum,” which a POSA would have understood to be the same dual cure bonding layer in Wilson. (EX1020, 3; *see, e.g.*, my opinions for limitation 1[b][i] and 1[c] under **Ground 1**.) The PRB-2012-Catalog also specifies that these repair units are to be applied “with Fast-Dry Self-Vulcanizing Cement,” which a POSA would have known is an “activating cement” applied to the dual cure bonding layer in Wilson. (EX1020, 3, 7; Wilson, 4:27-29.) Indeed, the PRB-2012-Catalog lists a “Cleaner Fluid” that “[d]issolves lubricants and contaminants prior to buffing.” (EX1020, 7.)

159. Patch Rubber’s website also includes a page for “Training & Repair Instructions” which links to five different tire repair manuals. (EX1029.) Each repair manual is consistent with a POSA understanding to clean and buff the surface of a tire before applying a tire patch as each expressly instructs the technician to clean and buff the tire surface before applying the fast-dry cement and patch. (*See* EX1030, 2; EX1031, 3-4; EX1032, 3-4; EX1033, 1; EX1034, 4.) It therefore would

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have been obvious to a POSA to clean and/or buff the tire surface in Wilson before adhering the patch 10, as such steps were industry standard and consistent with Patch Rubber Company procedure for using the products expressly identified in Wilson.

8. Dependent claim 13

160. This claim depends from claim 11 and recites “*further comprising applying pressure to the assembly after the step of placing.*” In my opinion, Wilson discloses this claim. Wilson discloses that “[t]he patch assembly is then stitched to the innerliner of the vulcanized tire” and “optionally may be clamped to the tire innerliner **75**, until the curing cycle is completed.” (Wilson, 4:26-37.) Stitching is a process that uses a tool to apply pressure onto a tire patch to ensure a complete attachment of the patch assembly surface and the surface of the inner liner and to remove any air pockets between the surfaces. (*See, e.g.*, ’027 patent, 14:34-58 (“using a stitching tool, whereby moderate pressure is applied”).) Clamping the patch assembly 60 to the tire would also result in pressure being applied to the patch assembly 60 after the assembly 60 is placed on the tire to cure. Thus, in my opinion, Wilson discloses and renders obvious dependent claim 13.

9. Independent claim 15

(a) Preamble: “A vulcanized rubber tire comprising:”

161. In my opinion, to the extent this preamble is limiting, it is disclosed by

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Wilson for the same reasons I discussed for the preamble for claim 1. Wilson discloses that “[i]n a preferred embodiment, the rubber patch is vulcanized and then assembled to the vulcanized tire.” (Wilson, 3:42-44.) Wilson’s rubber patch assembly, including the rubber patch and permanently adhered dual cure bonding layer, is assembled to the innerliner of a vulcanized tire using activating cement, stitching the patch assembly to the innerliner, and allowing sufficient time for the “patch assembly/tire assembly” to cure so that “a strong bond between the tire and patch assembly” results, as shown in Figure 2 (*see below, annotated*). (Wilson, 4:26-32.) Thus, in my opinion, to the extent the preamble of claim 15 is limiting, it is satisfied by Wilson.

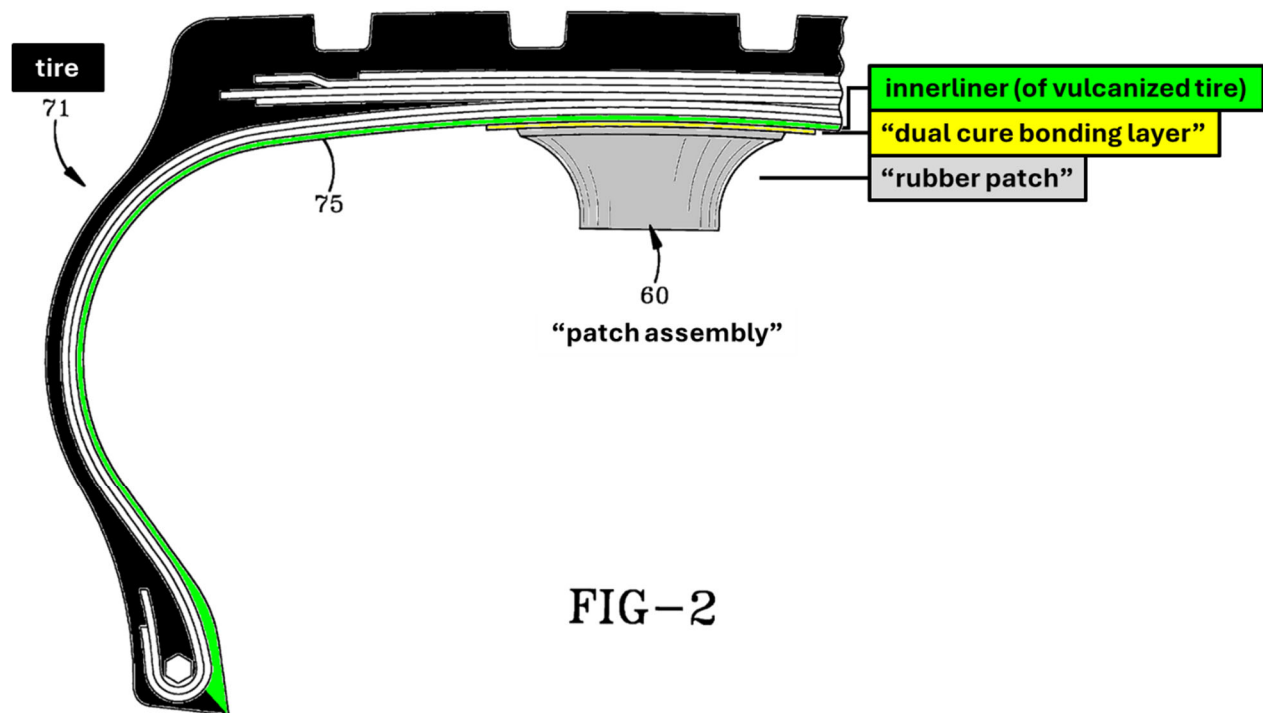


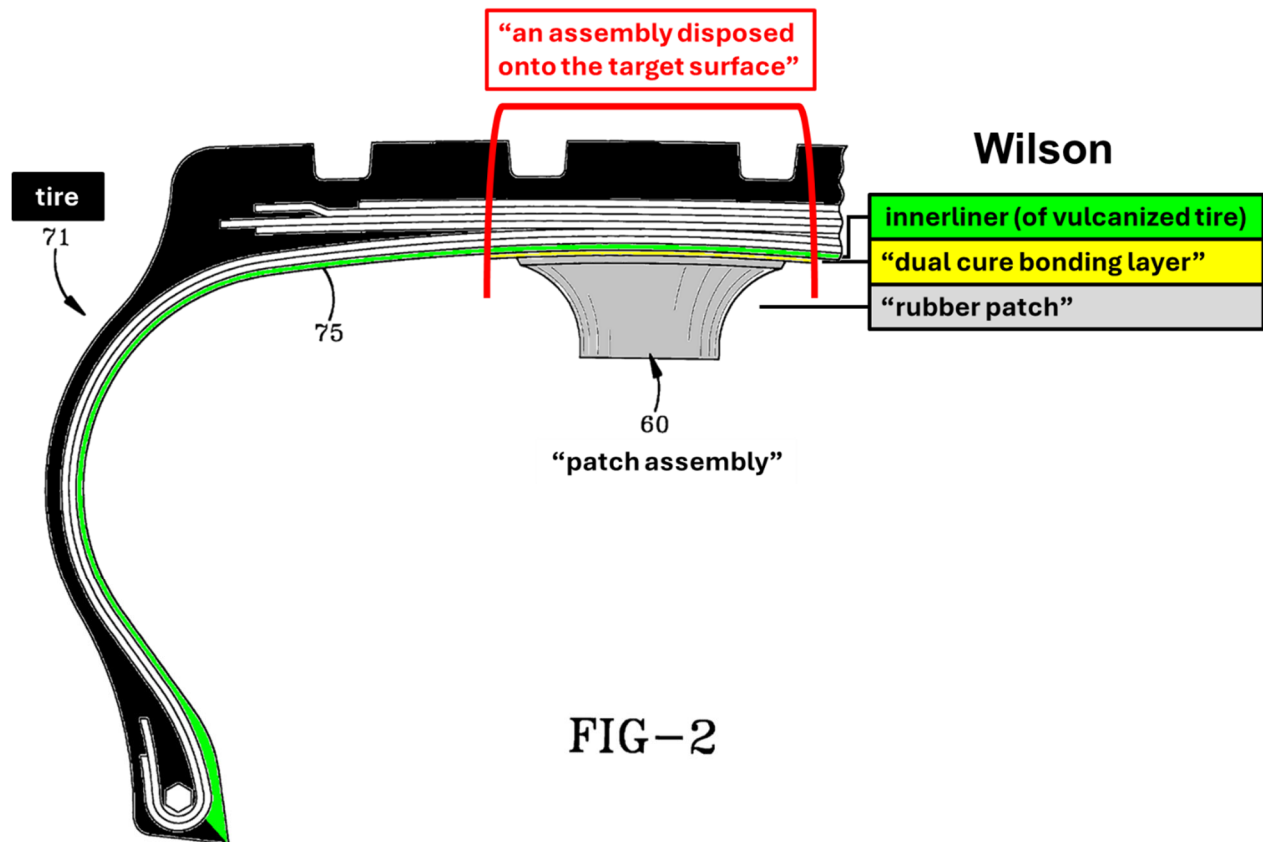
FIG-2

(b) Limitation 15[a]: “a target surface disposed along a portion of the rubber tire;”

162. In my opinion, this limitation is rendered obvious for the same reasons I discussed for limitation 11[a] (under **Ground 1**). In particular, Figure 2 of Wilson shows the disclosed patch assembly assembled onto a target surface disposed along a portion of the inner liner of the rubber tire.

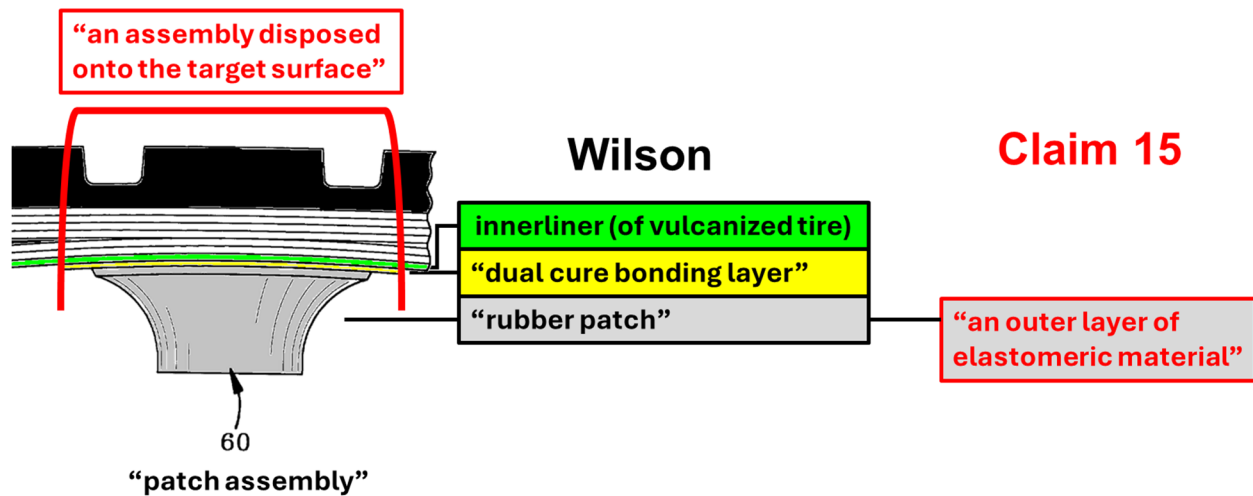
(c) Limitation 15[b]: “an assembly disposed onto the target surface and comprising:”

163. In my opinion, this limitation is rendered obvious for the same reasons I discussed for limitation 11[b]. Again, Figure 2 of Wilson shows the disclosed patch assembly disposed onto a target surface of the innerliner of the rubber tire:



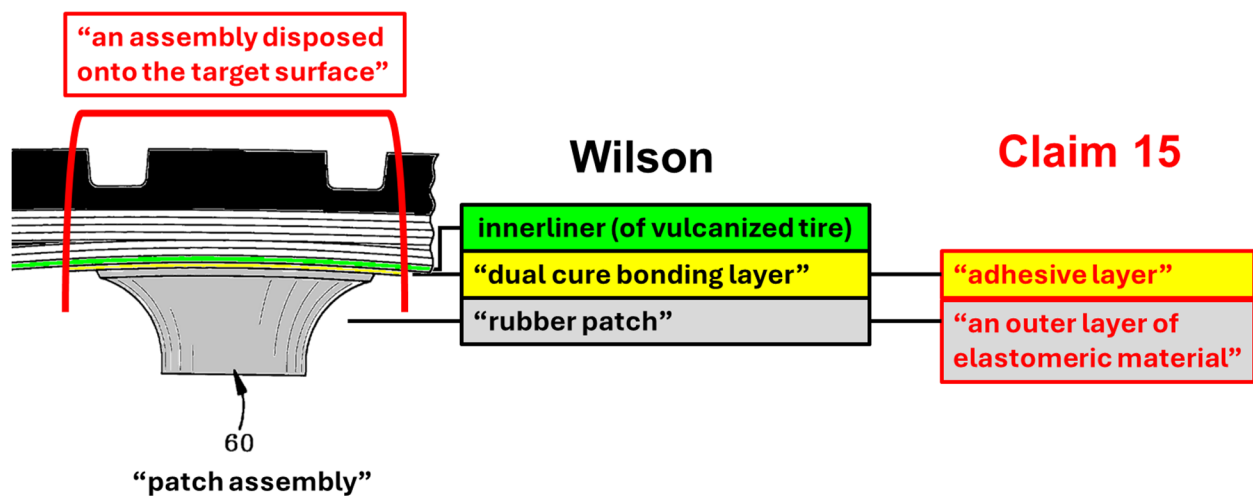
(d) Limitation 15[c]: “an outer layer of elastomeric material; and”

164. In my opinion, this limitation is rendered obvious for the same reasons I discussed for limitation 1[a], as depicted in the following excerpted and annotated portion of Fig. 2:



(e) **Limitation 15[d]: “an adhesive layer connected with the outer layer;”**

165. In my opinion, this limitation is rendered obvious for the same reasons I discussed for limitation 1[b] with respect to Wilson’s dual cure bonding layer that is permanently assembled to the patch using a non-curing cement to form the patch assembly (Wilson, 4:1-10):



(f) **Limitation 15[e]: “wherein at least a portion of the outer layer comprises a barrier material composition to mitigate migration of material from the rubber tire.”**

166. In my opinion, this limitation is rendered obvious for the same reasons I discussed for limitations 1[b], 11[d] and claim 5 (under **Ground 1**).

10. Dependent claim 16

167. This claim depends from claim 15 and recites “*wherein the assembly further comprises a cavity disposed therein.*” In my opinion, this claim is rendered obvious for the same reasons I discussed for claim 7.

11. Dependent claim 17

168. This claim depends from claim 16 and recites “*wherein an element is disposed within the cavity.*” In my opinion, this claim is rendered obvious for the same reasons I discussed for claim 8.

12. Dependent claim 18

169. This claim depends from claim 16 and recites “*wherein the cavity is disposed beneath the outer layer.*” In my opinion, this claim is rendered obvious for the same reasons I discussed for claim 9.

13. Independent claim 19

(a) Preamble: “An assembly for attachment to a vulcanized rubber tire comprising:”

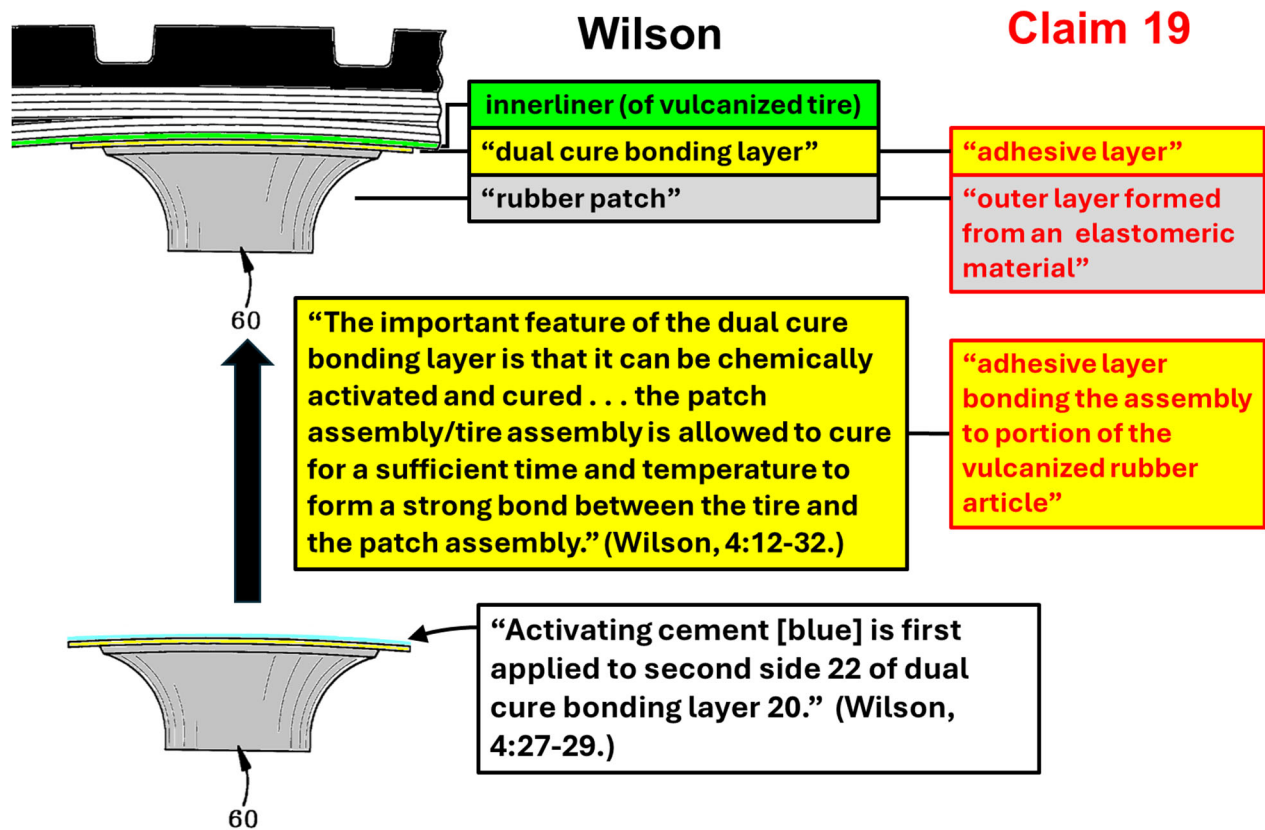
170. In my opinion, to the extent this preamble is limiting, it is disclosed and/or rendered obvious for the same reasons I discussed for the preamble of claim 1 (and recites the identical language to the preamble of claim 1).

(b) Limitation 19[a]: “an outer layer formed from an elastomeric material;”

171. In my opinion, this limitation is rendered obvious for the same reasons I discussed for limitation 1[a] and 15[c] regarding Wilson’s rubber patch being an “outer layer of an elastomeric material.”

(c) Limitation 19[b]: “an adhesive layer bonding the assembly to portion of a vulcanized rubber tire; and”

172. In my opinion, this limitation is rendered obvious for the same reasons I discussed for limitation 1[c] and 11[c] with respect to the dual cure bonding layer of Wilson’s patch assembly bonding the assembly to a portion of the innerliner of the vulcanized tire.



(d) **Limitation 19[c]: "a cavity disposed within the assembly for accommodating an element therein;"**

173. In my opinion, this limitation is rendered obvious for the same reasons I discussed for claims 7 and 8.

(e) **Limitation 19[d]: "wherein the outer layer comprises a material composition that acts as a barrier to material migrating from the vulcanized rubber tire."**

174. In my opinion, this limitation is rendered obvious for the same reasons I discussed for limitations 1[b], 11[d], and claim 5 (under **Ground 1**).

14. Dependent claim 20

175. This claim depends from claim 19 and recites “*wherein at least a portion of the cavity is disposed beneath the outer layer.*” In my opinion, this claim is rendered obvious for the same reasons I discussed for claim 9 (under **Ground 1**).

15. Dependent claim 21

176. This claim depends from claim 19 and recites “*wherein the adhesive layer is connected with the outer layer.*” In my opinion, this claim is rendered obvious for the same reasons I discussed for limitation 1[b][i]. (See Wilson, 4:1-10 (“Affixed to the second side **18** of the vulcanized tire patch is a dual cure bonding layer **20**, which has a first side (not shown) and a second side **22**. This dual cure bonding layer may be assembled to the patch at any time following vulcanization of the patch and prior to assembly of the patch assembly to the tire innerliner. The dual cure bonding layer is permanently assembled to the patch to form patch assembly **60**. A non-curing cement (not shown) is applied to side **18** of the patch in order to hold the dual cure bonding layer **20** onto the patch.”).)

16. Dependent claim 22

177. This claim depends from claim 19 and recites “*wherein the outer layer includes an indicia along an outer surface.*” In my opinion, this claim is rendered obvious for the same reasons I discussed for limitation 1[a] (under **Ground 1**).

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C. Ground 2: Claim 12 is rendered obvious by Wilson in view of DiRocco.

178. To the extent PO argues that it would not have been obvious to a POSA to undertake the step recited in claim 12 of “*preparing the identified surface before the step of placing*” under Ground 1, I herein expressly combine the disclosures of Wilson in view of DiRocco in this Ground 2. That is, my opinions for claim 12 under **Ground 1** apply here, as they provide details about what was known in the art at the time of the ’027 patent and support motivations to combine Wilson with DiRocco. DiRocco is relied on solely for its explicit disclosures of cleaning and buffing prior to patch placement.

179. As I discussed for this claim under **Ground 1**, it was standard practice in the industry at the time of the ’027 patent to prepare the innerliner surface of the tire before placing a patch. (*See, e.g.,* DiRocco, 4:3-9 (“The application of the patch **10** to the tire **11** follows the procedure well known to those skilled in the art wherein an inner surface 32 of the tire 10 around the injury **12** is cleaned and buffed.”) (emphasis added); DeTrano, 7:44-55 (“[t]he surfaces to be bonded may then be buffed to RMA1 or RMA2 Standard Buffing Textures”), claim 8.) DiRocco is an analogous reference that describes a tire repair patch made of “a blend of natural and SBR rubbers” and a base cushion gum layer 13 made of “natural rubber.” (DiRocco, 3:20-25.) DiRocco explains that “[t]he application of the patch **10** to the

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tire **11** follows the procedure well known to those skilled in the art wherein an inner surface **32** of the tire **10** around the injury **12** is cleaned and buffed.” (DiRocco, 4:3-6 (emphasis added).) Like Wilson, a chemical cement is applied to the base cushion gum layer and then the patch is applied to the tire 11. (DiRocco, 4:15-27.)

180. In my opinion, it would have been obvious to a POSA to combine the preparation techniques in DiRocco with Wilson so that the tire in Wilson is cleaned and buffed prior to the patch assembly 60 being applied to the tire. DiRocco makes clear that this preparation is “well known to those skilled in the art” so combining the references in this way would have yielded predictable results and would have resulted in an improvement to Wilson, as cleaning and/or buffing allows for a more secure bonding between the patch and tire. There also would have been a reasonable expectation of success with this combination, as these steps were standard procedure in the industry at the time.

181. Wilson’s disclosures further motivate this combination. Wilson states that “[e]xemplary non-curing cement and an exemplary dual cure bonding layer are products of Patch Rubber Company.” (Wilson, 4:10-12.) As I discussed for this claim under **Ground 1**, Patch Rubber Company provides various catalogs, webpages, and manuals detailing the process for attaching a patch (with a dual cure

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bonding layer-equivalent product) to a tire, including steps for cleaning and buffing the site prior to placement. (See EX1020, 3, 7; EX1029; EX1030, 2; EX1031, 3-4; EX1032, 3-4; EX1033, 1; EX1034, 4; EX1035, 2.) A POSA would have been able to look to these Patch Rubber resources to learn how a patch could be applied to the tire using the products that Wilson identified in its specification and would have understood from the instructions that buffing and cleaning with the cleaner fluid are key steps in properly applying a patch to a tire. A POSA would have then been motivated to implement these steps in Wilson in combination with other tire patch references, like DiRocco, which emphasizes and expressly instructs to clean and buff the tire prior to applying the patch. Again, combining Wilson with DiRocco makes these industry standard steps explicit.

182. For these reasons, the combination of Wilson and DiRocco render claim 12 obvious.

D. Ground 3: Claims 1-3, 5, and 7 are rendered obvious by Bielicki

1. Independent claim 1

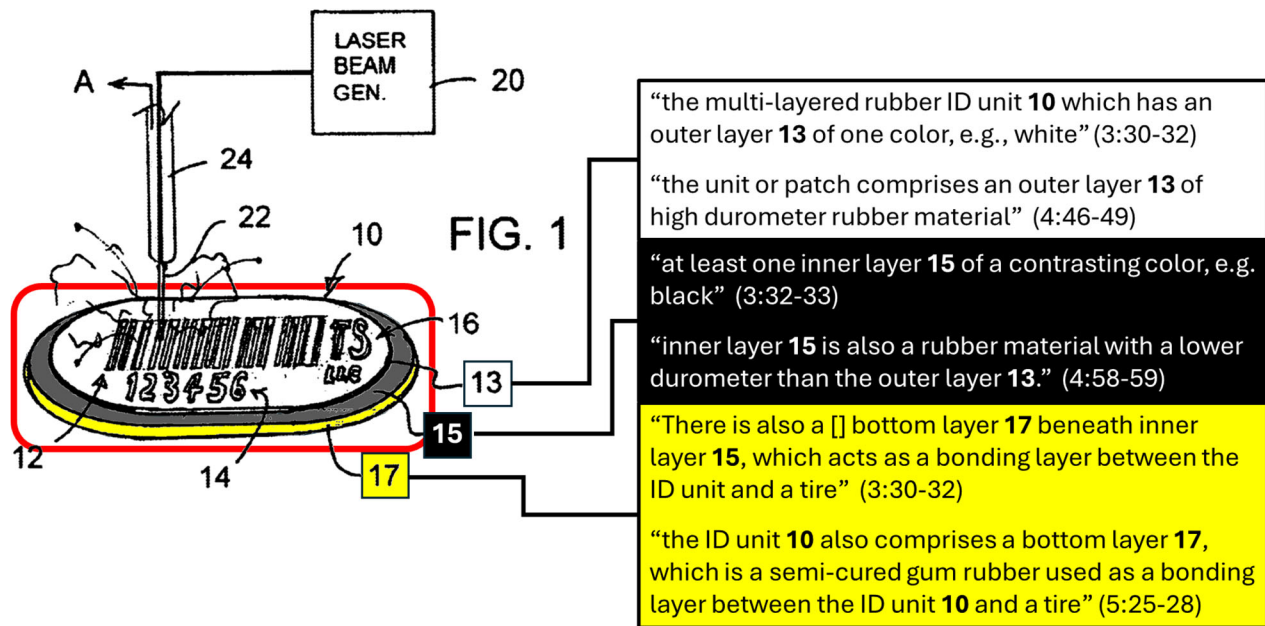
(a) Preamble: “An assembly for attachment with a vulcanized rubber article comprising:” (1[pre])

183. To the extent this preamble is limiting, in my opinion it is disclosed and rendered obvious by Bielicki.

184. Bielicki discloses a “multi-layered rubber ID unit **10** which has an outer

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layer **13** of one color, e.g., white, and at least one inner layer **15** of a contrasting color, e.g. black.” (Bielicki, 3:30-35.) The “outer layer **13**” is “of high durometer rubber material” and the “inner layer **15**” is “a rubber material with a lower durometer than the outer layer **13**.” (Bielicki, 4:46-49, 4:56-59.) “There is also a [] bottom layer **17** beneath inner layer **15**, which acts as a bonding layer between the ID unit [**10**] and a tire.” (Bielicki, 3:30-35.) The bonding layer is a “semi-cured gum rubber.” (Bielicki, 5:25-28.) The multi-layered rubber ID unit 10 (red annotation below) of Bielicki is an “**assembly**” that is “**for attachment with**” a tire:



(Bielicki, Fig. 1 (annotated); *see also id.*, Abstract, 2:28-31 (“It is an object of the present invention to provide a method for manufacturing a weather and wear resistant **rubber identification unit for a tire** with a selected pattern on the unit, and

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an identification unit made by that method.”) (emphasis added), 2:32-38 (“The unit can be used as part of **a tire** tracking . . . being marked with individual, unique and serialized patterns, such as a bar code. This is particularly true where the system is used for **truck tires**.”) (emphasis added), 3:30-35, 4:31-40, 5:22-29, claim 5 (“[a] weather and wear resistant **rubber unit for a tire** with a selected pattern on the unit . . . a multi-layered rubber unit having an outer layer of one color and an inner layer of a contrasting color”) (emphasis added).)

185. A POSA would have understood (or at least found it obvious) that Bielicki’s disclosure of “a semi-cured gum rubber used as a bonding layer between the ID unit **10** and **a tire**,” would mean that the “assembly” was suitable for attachment to a “vulcanized” rubber tire. (Bielicki, 5:25-28 (emphasis added); *see also* EX1013, 1; EX1014, 337-38; EX1015, 2, 3, 6, 20-25, 29, 75; ’027 patent, 1:22-24, 3:61-65, 4:26, claim 14.) A POSA would understand that the uncured aspect of the semi-cured gum rubber provides the gum rubber with tack/stickiness as well as available reaction sites capable of forming chemical bonds with a surface of a vulcanized tire, which allow it to be attached to a vulcanized rubber tire. (*See, e.g.*, EX1014, 337-38.)

186. Bielicki’s further description of the multi-layer ID unit as a “patch” would also indicate to a POSA that the ID unit/patch was for use with a vulcanized

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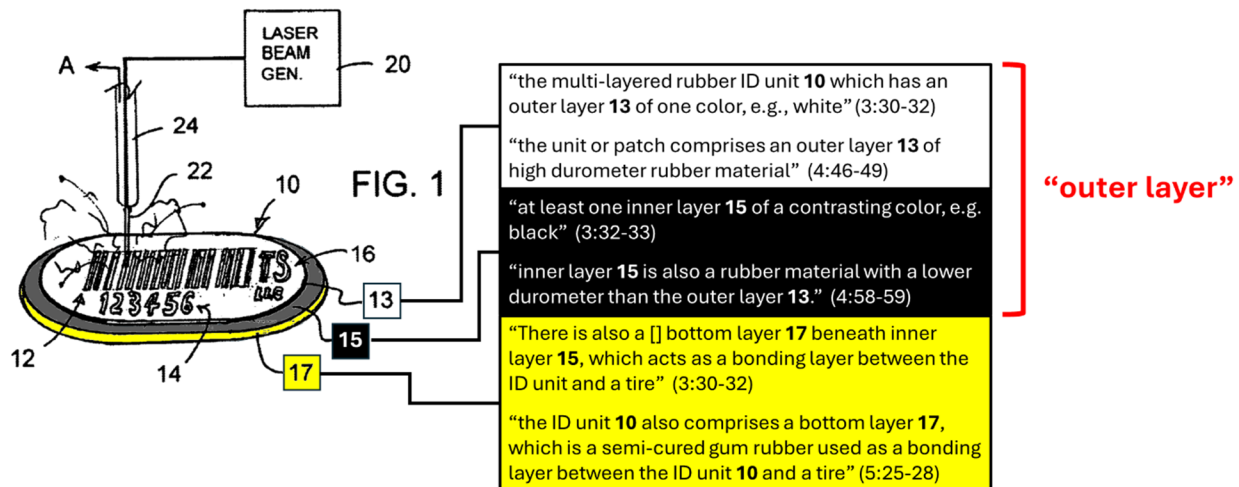
rubber tire since patches are used on vulcanized rubber tires (and there is no mention in Bielicki of applying the ID patch to a green or uncured tire during manufacturing of the tire). (See Bielicki, 1:7-12 (“multi-layered workpiece, unit or patch”), 4:44-49 (“[t]he unit or patch **10**” and “the unit or patch”); EX1015, 20-25, 29; EX1017; EX1023.) Accordingly, a POSA would have known (and at least would have found it obvious) that Bielicki’s disclosed ID unit/patch is for use with vulcanized rubber tires and thereby satisfies the claimed “**assembly for attachment with a vulcanized rubber article.**”

187. Accordingly, in my opinion, Bielicki discloses and/or teaches the preamble of claim 1 of the ’027 patent.

(b) Limitation 1[a]: “an outer layer of elastomeric material having a visual feature; and”

188. Bielicki discloses this limitation. The outer layer 13 and inner layer 15 of Bielicki’s ID unit or patch 10 are the claimed “**outer layer,**” (i.e., “at least one layer that is outermost”):

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189. The outer and inner layers 13, 15 in Bielicki are made of rubber, which is an “**elastomeric material.**” (Bielicki, 4:46-49 (“an outer layer 13 of high durometer rubber material”), 4:58-59 ([t]he inner layer 15 is also a rubber material”).) Indeed, Bielicki repeatedly describes the disclosed ID unit or patch 10 as a (multilayered) rubber unit. (See Bielicki, 2:11-25 (“a multi-layered rubber unit that comprises layers of the same type of material (e.g., rubber”), 3:21-29 (“rubber ID unit 10”), 3:30-35 (“multi-layered rubber ID unit 10”).) The ’027 patent admits that rubbers are elastomeric materials. (’027 patent, 5:66-6:6 (“elastomeric materials ... include and are not limited to vulcanized rubber, natural rubber, SBR, nitrile rubber, neoprene rubber[.]”).) PO’s infringement contentions also admit rubber is elastomeric. (EX1025, 3 (“Comprised of rubber, the dock in the Accused Revvo Tire Sensor Products is elastomeric[.]”).)

190. Bielicki discloses multiple “**visual features**” associated with outer

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layer 13 and inner layer 15, which make up the claimed “**outer layer**.” First, the outer and inner layers 13, 15 each have a different color – e.g., white and black respectively. (Bielicki, 3:30-35, 5:22-23 (“The inner layer **15** is preferably a black contrast to the white outer layer **13**.”).) Colors are visually detectable and therefore qualify as “**visual features**” under PO’s interpretation. (*See also* ’027 patent, 2:13-18 (“the display layers may each be of a different color and/or be patterned or otherwise configured so as to provide a desired display indicia”), 4:56-5:37, 8:3-28.) The outer layer 13 in Bielicki also includes patterned cutouts in the form of “a barcode **12** and associated numbers **14**, and/or unserialized information like a company logo **16**.” (Bielicki, 3:21-29; *see also id.*, Abstract, 1:8-12, 2:32-38.) Each of these are visually detectable and serve as a “**visual feature**” under PO’s interpretation as well. (*See also* ’027 patent, 5:27-37 (“the use of a patterned display layer ... may be in the form of a barcode”), 4:56-5:37, 8:3-28.) Furthermore, the “**outer layer**” of Bielicki’s ID units also have a shape that is visually detectable. (*See also* ’027 patent, 12:35-37 (“assemblies may be configured to provide a desired display indicia or the like through the shape, design, configuration or the like”).)

191. Thus, in my opinion, Bielicki discloses “**an outer layer of elastomeric material having a visual feature.**”

(c) **Limitation 1[b]: “[i] an adhesive layer adhered to an interface surface of the outer layer, [ii] wherein at least a portion of the outer layer adjacent the interface surface comprises a barrier material composition, and”**

192. For ease of discussion, and for consistency with the Petition, I have divided this limitation into two parts. In my opinion, Bielicki discloses this limitation.

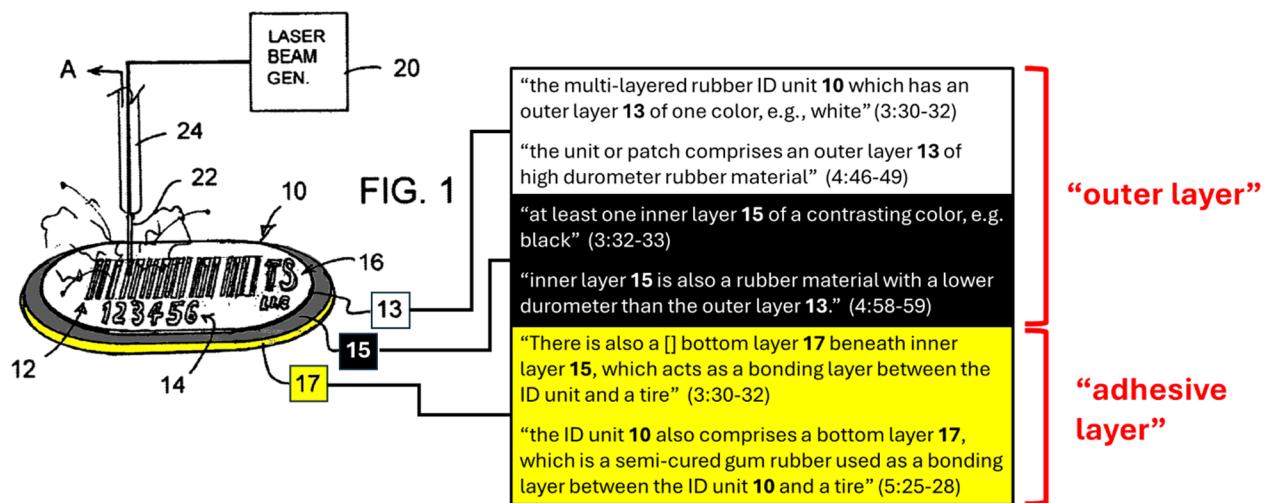
(i) **Limitation 1[b][i]: an adhesive layer adhered to an interface surface of the outer layer,**

193. Bielicki’s bottom layer 17 is the claimed “**adhesive layer.**” Bielicki describes the bottom layer 17 as made of a “semi-cured gum rubber” that “acts as a bonding layer between the ID unit and a tire.” (Bielicki, 3:30-35, 5:22-29.) This “bonding” action satisfies PO’s construction for “**adhesive layer**” (i.e., “at least one layer that bonds to”).

194. I understand from counsel that, in its infringement contentions, PO took the position that the “cushion gum” on the bottom of the accused products is an “adhesive layer.” (EX1025, 12-13.) The term “cushion gum” and “gum rubber” are well known terms of art, and a cushion gum is a gum rubber. A POSA would have known that Bielicki’s *semi-cured* gum rubber would have tack (or stickiness), such that it bonds, adheres, or sticks to surfaces, and therefore that it would be adhered to the adjacent layer within the multilayer patch—i.e., semi-cured gum rubber bonding

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layer 17 would be adhered to inner layer 15. (See, e.g., EX1014, 337; EX1015, 29; Bielicki, 4:33-35.) The **“adhesive layer”** of Bielicki (i.e., bonding layer 17) is thus **“adhered to an interface surface of the outer layer”** (which forms part of the recited **“outer layer”** of claim 1 of the '027 patent), depicted as follows:



(Bielicki, Fig. 1 (annotated).)

195. I note that no other layers appear between the inner layer 15 and the semi-cure gum rubber bonding layer 17 in Bielicki’s multilayered rubber ID unit 10 in Figure 1. A POSA would have therefore understood (or at least found it obvious) that the inner layer 15 has a bottom surface that is in contact with a top surface of the bottom bonding layer 17. The inner layer 15’s bottom surface is the claimed **“interface surface of the outer layer.”**

196. A POSA would have also understood that the bottom layer 17 (i.e., the

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“**adhesive layer**”) is “**adhered to**” the bottom surface of the ID Unit’s inner layer 15 (i.e., the “**interface surface of the outer layer**”) to form the three-layered patch described throughout Bielicki. (See Bielicki, 2:11-25 (“a multi-layered rubber unit that comprises layers of the same type of material (e.g., rubber”), 4:31-40 (“the semi-cured ID unit layers”), 5:22-29 (“the ID unit **10** also comprises a bottom layer **17**”), 3:30-35 (the “bottom layer 17 ... acts as a bonding layer between the ID unit and a tire”).) Nothing in Bielicki indicates that the layers readily separate from each other. To the contrary, the patch is illustrated and described as a single unit throughout the specification, which expressly notes that “[t]he method starts by providing the multi-layered rubber ID unit **10**,” indicating the patch is provided in its multi-layered, assembled configuration. (Bielicki, 3:30-35.)

197. Bielicki further identifies “Patch Rubber Company/Myers Industries, Inc.” as supplying the patch, which would only further confirm a POSA’s understanding that the patch is supplied as a pre-assembled multi-layered rubber unit wherein the semi-cured gum rubber bonding layer is adhered to the surface of inner layer 15. (See Bielicki, 4:44-45.)

198. For these reasons, in my opinion, Bielicki discloses “**an adhesive layer adhered to an interface surface of the outer layer.**”

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(ii) **Limitation 1[b][ii]: wherein at least a portion of the outer layer adjacent the interface surface comprises a barrier material composition, and**

199. I understand from counsel that PO proposed a construction in district court for “**barrier material composition**” as “material composition that has properties of shock absorbance, elastomeric expansion and/or contraction.” (EX1024, Ex. A at 3.) 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.**”

200. Bielicki further discloses that “[t]he inner layer **15** is [] a rubber material with a lower durometer than the outer layer **13.**” (Bielicki, 4:56-5:2.) “The term durometer is used in the art to signify a measurement of the hardness of a rubber material.” (*Id.*, 4:44-55.) That is, durometer provides a relative measure of the elastic properties of a rubber. A POSA would have understood that Bielicki’s inner layer 15—i.e., the “**portion of the outer layer adjacent the interface surface**”—having a relatively “lower durometer” would be a relatively softer and more flexible rubber, which means it would have relatively greater shock absorbing properties and

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relatively greater elastomeric expansion and/or contraction in comparison to other elastomeric rubbers with higher durometer. Accordingly, in my opinion, Bielicki's lower durometer inner layer 15 satisfies this claim element's requirement of **"at least a portion of the outer layer adjacent the interface surface comprises a barrier material composition."**

201. I further note that in the '027 patent the qualities of a "barrier material composition" are discussed with reference to an "intermediate or barrier layer 24." (See '027 patent, 6:11-58, 7:47-60, Fig. 2.) The patent explains that "the intermediate layer is formed from an elastomeric material." (*Id.*, 6:11-58.) "Elastomeric materials useful for forming the intermediate layer 24 include and are not limited to gum rubber, vulcanized natural rubber SBR [i.e., NR/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." (*Id.*, 6:33-58.)

202. In its infringement contentions, PO further confirmed the inherent properties of rubber, stating: "[c]omprised of rubber, the dock in the Accused Revvo Tire Sensor Products is elastomeric and **mitigates transmission of shock forces** from the tire to the housing when the dock retaining member is attached to the tire and the housing is attached to the dock retaining member." (EX1025, 3 (emphasis

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added).) Because Bielicki's outer and inner layers 13, 15 (collectively the claimed "outer layer") are made of rubber, which is elastomeric, it follows from PO's admissions that the layers 13, 15 would display these properties and satisfy this limitation (i.e., they "**comprise[] a barrier material composition**"). (Bielicki, 2:11-25, 3:30-35, 4:44-5:35.)

203. It is important to note that, at the time of the '027 patent, it was very much expected that tire patches exhibit at least some shock absorption. DiRocco – a tire patch reference from 1981 – explains that past tire patches were "relatively stiff and did not flex or move with the tire so that during operation of the tire there was edge cracking and breaking loose of the patch from the tire." (DiRocco, 1:6-14.) "In an effort to overcome this problem, tire patches have been made ... so that there would be less resistance to flexing and movement of the patch relative to the tire surface during operation." (*Id.*, 1:15-30.) This was a problem that had been identified and resolved more than 30 years before the filing date of the '027 patent. Notably, DiRocco's patch construction consisted of rubber layers. "With this construction the patch is given a flexibility and resilience which resists edge cracking and breaking loose of the edges from the tire during operation." (DiRocco, 1:34-46.) Bielicki's patch, which is also constructed from rubber, would exhibit similar characteristics.

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204. Consistent with this, in its infringement contentions, PO appears to be depicting shock absorbance of the accused dock by bending it to show that it is flexible and elastic. (EX1025, 20-21.) A POSA would have understood that Bielicki's inner layer 15 is likewise bendable and flexible too and therefore also displays shock absorbing properties and elastomeric expansion and/or contraction (i.e., it **"comprises a barrier material composition"**).

205. In my opinion, a POSA would have understood (or at least have found it obvious) that the patch in Bielicki, in particular the lower-durometer inner layer 15 that interfaces with bottom bonding layer 17, is elastomeric and flexible so that it can bend and bond to (and remain bonded to) the curved sidewall of the tire and possess sufficient elasticity such that it would be resilient to the forces and strains it would experience from the use of a tire when it is driven. A POSA would understand that without such flexibility, the patch would not reliably remain adhered to the tire.

206. Accordingly, in my opinion, Bielicki discloses **"wherein at least a portion of the outer layer adjacent the interface surface comprises a barrier material composition."**

(d) **Limitation 1[c]: "wherein the adhesive layer is formed from a material capable of chemically bonding with a surface of a vulcanized rubber article."**

207. In my opinion, Bielicki discloses and/or renders this limitation obvious.

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208. The bottom layer 17 in Bielicki is comprised of a “semi-cured gum rubber” that “acts as a bonding layer between the ID unit and a tire.” (Bielicki, 3:30-35, 5:22-29.) Claim element 1[c] only requires that the material merely be “**capable** of chemically bonding.” A POSA would have known (or at least found it obvious) that Bielicki’s disclosed semi-cured gum rubber bonding layer 17 is “**a material capable of chemically bonding with a surface of a vulcanized rubber article.**” Curing in the context of rubbers used in tires is generally synonymous with chemical reactions that form cross-linking chemical bonds. (*See, e.g.*, EX1015, 24-25, 29; EX1014, 337-38; EX1023, 2.) By describing the gum rubber as “semi-cured,” a POSA would understand that the gum rubber has available reaction sites for additional curing/reaction within its molecular structure. Those available reaction sites are capable of chemically bonding with a vulcanized rubber tire. This understanding of a POSA is confirmed in column 4, lines 33-35 of Bielicki, which reads: “This finally and fully dries the units but without fully curing the semi-cured ID unit layers that are needed to properly attach the ID units to a tire[,]” which is referring to the semi-cured gum rubber bonding layer. Thus, this passage additionally confirms to a POSA that the semi-cured gum rubber bonding layer 17 is a “**a material capable of chemically bonding with a surface of a vulcanized rubber article.**”

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209. PO's admissions in the parallel district court litigation further support a finding that Bielicki's bottom layer 17 satisfies limitation 1[c]. There, PO identified the "cushion gum" in the accused product as the "adhesive layer" that satisfies this limitation, rationalizing that "[t]he cushion gum ... is capable of being chemically bonded with the tire, such as with vulcanizing fluid[.]" (EX1025, 46.) "Cushion gum" is a gum rubber. Thus, based on PO's admissions, if a "cushion gum" is capable of being chemically bonded with a tire via vulcanizing fluid, then the semi-cured gum rubber in Bielicki would likewise have the same chemical capability.

210. For all the reasons discussed above, it is my opinion that Bielicki renders this limitation obvious.

2. Dependent claim 2

211. This claim depends from claim 1 and recites "*wherein the outer layer comprises a first layer and a second layer disposed beneath the first layer.*" As discussed throughout, the outer and inner layers 13, 15 of Bielicki form the claimed "**outer layer.**" The inner layer 15 is disposed beneath the outer layer 13, as shown throughout in Figure 1 of Bielicki.

3. Dependent claim 3

212. This claim depends from claim 2 and recites "*wherein the first layer is*

colored differently from the second layer.” Bielicki discloses that the “inner layer 15 is preferably a black contrast to the white outer layer 13.” (Bielicki, 5:22-29.)

4. Dependent claim 5

213. This claim depends from claim 1 and recites “*wherein the barrier material composition impairs migration of a material constituent within the assembly when the assembly is attached to a vulcanized rubber article.*”

214. I note that claim 5 does 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.

215. The specification of the ’027 patent provides no guidance for any quantification for how much “**the barrier material composition impairs migration**” or the nature or any “material constituents” whose migration need be impaired. Indeed, “impair” is never used in the specification. The specification likewise merely generically refers to “unwanted constituent[s],” not any and all “**material constituent[s]**” such as those that may be *wanted* constituents. (’027

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patent, 6:33-39 (“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**.”), 8:62-9:3 (“The presence of such an intermediate adhesive layer **50** in this second example operates to provide a greater degree of adhesion between the display layer **48** and the intermediate layer **44**, and may also operate to provide an extra degree of barrier protection against the migration of any unwanted constituents from the intermediate layer **44**, adhesive layer **46**, and/or the vulcanized rubber article that the display assembly is attached to.”), 9:11-16 (“The intermediate adhesive layer **50** is formed from a material capable of forming a bonded attachment between an underside surface of the display layer **48** and a surface of the intermediate barrier layer **44**, and optionally acting as a barrier to minimize or prevent the migration of any unwanted constituents into the display layer **48**.”).)

216. In my opinion and considering the breadth of the claim, Bielicki discloses or at least renders this claim obvious. As I noted above with respect to claim limitation 1[b][ii], the rubber inner layer 15 of Bielicki that interfaces with the adhered semi-cured gum rubber bonding layer 17 is a “barrier material composition”

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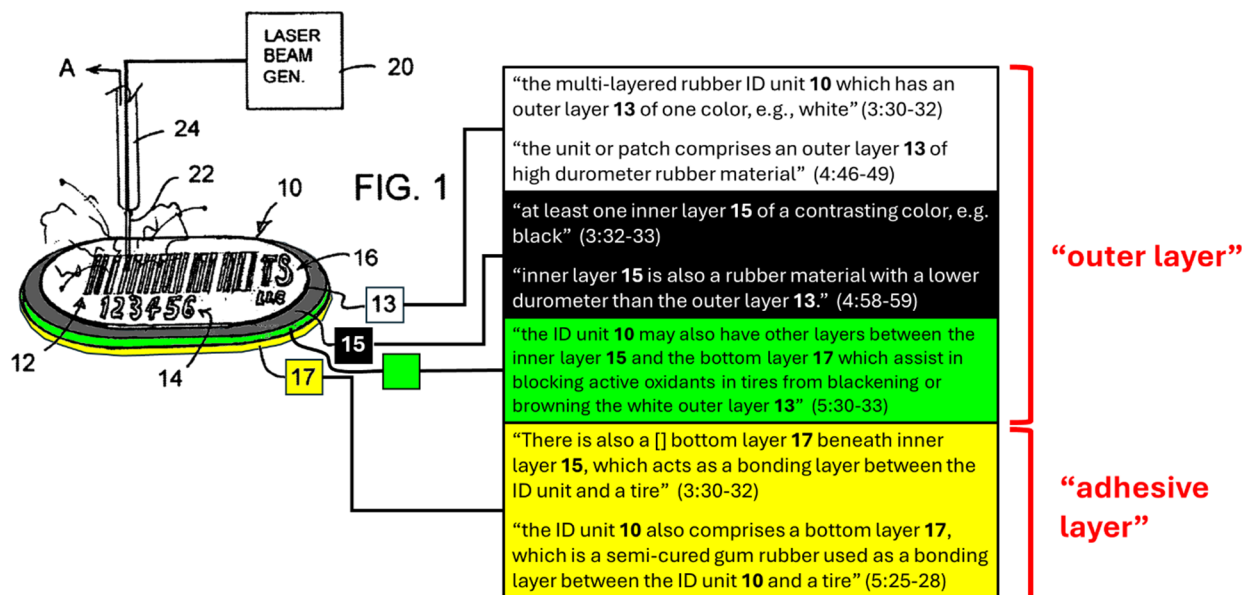
because it is an elastomeric rubber with properties of shock absorbance, elastomeric expansion and/or contraction. As a physical, solid material, a POSA would have understood and found obvious that the rubber inner layer 15 would necessarily impede (to at least some degree) the free flow of materials within Bielicki's multi-layered ID patch and thereby impair the migration of such materials when the patch is bonded to a vulcanized tire.

217. For example, particulate "material constituents" within the assembly would have their migration impaired within Bielicki's multi-layered patch by the rubber inner layer 15 after it was bonded to a tire, such as by impairing the migration of particulate matter from the semi-cured gum rubber bonding layer 17 to outer layer 13. Similarly, rubber inner layer 15 of Bielicki's multi-layered patch would also act as a diffusion barrier, that would necessarily impair the migration of chemical constituents that may be present in the tire or semi-cured gum rubber in reaching outer layer 13. Bielicki also discloses that the inner layer 15 "may be between 0.8 and 1.5 mm" (4:56-58), and while any thickness of that layer would impair migration of a material constituent within the assembly when the assembly is attached to a vulcanized rubber article, of course a thicker layer would more greatly impair migration within the assembly to outer layer 15 than would a relatively thinner layer. Thus, in my opinion, Bielicki's inner layer 15 alone discloses and renders obvious

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claim 5.

218. To the extent that Patent Owner argues that inner layer 15 of Bielicki does not satisfy this claim limitation, Bielicki also discloses that “[a]lternatively, the ID unit 10 may also have other layers between the inner layer 15 and the bottom layer 17 which assist in blocking active oxidants in tires from blackening or browning the white outer layer 13.” (Bielicki, 5:30-35.) In this regard, Bielicki discloses the following alternative depicted embodiment (with the additional “blocking” layer in green as part of the “outer layer” of claim 1 of the ’027 patent) that also renders claim 5 obvious:



219. The material of the layer(s) responsible for “blocking active oxidants” is the claimed “**barrier material composition.**” The “active oxidants” themselves are the “**material constituents.**” The act of blocking the oxidants in the tire from

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blackening or browning the white outer layer 13 occurs because the blocking layer **“impairs migration . . . within the assembly when the assembly is attached to a vulcanized rubber article.”** These “other layers” therefore perform the same barrier function recited in claim 5.

220. In my opinion, it would have been obvious to a POSA that any additional layer(s) performing this barrier function in Bielicki would be part of the claimed **“outer layer.”** The '027 patent confirms that there is no limit to how many layers can be included in an outer layer. (*See* '027 patent, Abstract (“one or more display layers”), 1:62-2:24, 3:61-4:28, 4:56-5:13.) And, for all intents and purposes, in the district court litigation, PO identifies the *entire* dock (minus the gum layer) as the **“outer layer.”** Following this same logic, it would have been obvious that the entirety of the patch/ID unit 10 (minus the semi-cured gum rubber bonding layer 17) is considered the **“outer layer”** for purposes of this proceeding too. It would have further been obvious to a POSA that the bottommost layer performing the barrier function in Bielicki has an **“interface surface”** that attaches to the bottom layer 17 the same way as the inner layer 15 to form the patch. In this manner, **“at least a portion of the outer layer adjacent the interface surface comprises a barrier material composition,”** as required for limitation 1[b][ii].

221. In my further opinion, it would also have been obvious to a POSA to

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implement the active oxidants blocking properties from the “other layers” described in Bielicki as part of the inner layer 15 of the patch in Bielicki. Bielicki makes clear that its patch is made of rubber so it would have been obvious that the “other layers” are also made of rubber or some rubber combination that could easily be incorporated into the inner layer 15. (Bielicki, Abstract (“rubber ID unit”), 1:8-12 (“relates generally to the field of marking rubber articles”), 2:11-25 (“the prior art does not teach marking of a multi-layered rubber unit that comprises layers of the same type of material (e.g., rubber)”).) Bielicki also discloses that “[t]hese additional layers are preferably black and 1 mm thick” which is the same preferred color and thickness as disclosed for inner layer 15 (Bielicki, 4:56-58, 5:33-35) and would therefore serve the same purpose in providing contrast with the white outer layer 13 for making the disclosed bar code with identical preferred thickness. A POSA would also, appreciate the benefits of consolidating layers by reducing the number of layers (and therefore thickness) of the patch, and would understand that there would be a reasonable expectation of success in implementing the properties from one layer into another. Thus, in my opinion, this provides another aspect of Bielicki’s teachings to a POSA that satisfies and renders obvious claim 5.

222. In my opinion, Bielicki renders claim 5 obvious for the foregoing reasons.

5. Dependent claim 7

223. This claim depends from claim 1 and recites “*the assembly as recited in claim 1 further comprising a cavity disposed therein.*” 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. (Bielicki, Fig. 1, Abstract, 1:8-12 (“a new and useful laser-assisted method of **cutting** a selected pattern **into** a multilayered workpiece, unit or patch”) (emphasis added), 2:39-49 (“to ablate the outer layer in the form of the selected pattern, to expose the at least one inner layer of contrasting color”); 3:21-29 (“the ablation or pattern **cutting** step of the invention”) (emphasis added), 3:42-45 (“The ID unit is thus scanned with the laser beam **22** to ablate the outer layer **13** in the form of the selected pattern **12,14,16**, to expose the inner layer **15** of contrasting color.”), 3:49-52 (“Sharp and deep grooves of the pattern are thus cut through the full thickness of the white top layer **13** and corresponding black grooves in the inner layer **15** are thereby made visible.”), 6:4-11 (“manipulating the laser beam to form the selected pattern by ablation, which pattern comprises **sharp and deep grooves of the pattern cut through a full thickness of the outer layer** so that the inner layer becomes visible to form the selected pattern”) (emphasis added).) Each cutout or groove is a “**cavity**” under its plain meaning (i.e., an unfilled or

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hollowed-out space within a mass) and is disposed in Bielicki's multi-layered rubber patch (i.e., the claimed "**assembly**").

E. Ground 4: Claims 1-3, 5, 7, 11-13, 15, and 16 are rendered obvious by Bielicki in view of the Patch Rubber Brochure and/or Tire-Track Brochure

224. In this **Ground 4**, I rely on Bielicki as a primary reference because its multi-layered rubber ID unit/patch has the same structure and functionality as the "assembly" in the Challenged Claims. I further rely on the Patch Rubber Brochure and Tire-Track Brochure, which both describe a commercial embodiment of the ID unit/patch invention disclosed in Bielicki, as secondary references that inform a POSA of certain features or functions that are or could readily be associated with Bielicki's ID Unit. Where my opinions in this **Ground 4** are based on the disclosures of Bielicki as described above in **Ground 3**, I incorporate those opinions without necessarily repeating them.

225. In my opinion, as set forth in more detail below, a POSA would have been motivated to combine the teachings of Bielicki, Patch Rubber Brochure, and Tire-Track Brochure references together because they are in the same field, describe the same ID unit/patch for attachment to tires for the purpose of tire identification and tracking, and are expressly undeniably interrelated with each other. That is, they are not only directed towards the same general subject matter of an ID unit/patch for

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a tire, but the Brochures are directed to marketing and advertising of the commercial embodiment of the same ID unit/patch as disclosed in Bielicki. A POSA would have had a reasonable expectation of success in combining the teachings of these references because they are each directed to that same multi-layered ID unit/patch and the Brochures merely expressly describe additional features associated with that ID unit/patch that would have been obvious from Bielicki. Accordingly, for this **Ground 4**, I have combined the disclosures of Bielicki in view of the disclosures in the Patch Rubber Brochure and the Tire-Track Brochure to demonstrate obviousness of claims 1-3, 5, 7, 11-13, 15-16, 19, 21, 22 of the '027 patent.

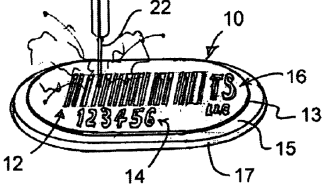
1. Motivation to Combine Bielicki, the Patch Rubber Brochure, and the Tire-Track Brochure with a Reasonable Expectation of Success

226. In my opinion, there is undeniable motivation to combine Bielicki with the Patch Rubber Brochure and Tire-Track Brochure. Each of these references are directed to similar (if not identical) ID units and their interrelatedness is expressly disclosed by cross-references within the references themselves, further supported by other related disclosures highlighting their relationship.

227. First, as I indicated in the summaries above, these references are directed to the same (if not identical) material ID unit/patch with barcodes for tire identification and tracking. The similarity across the ID unit/patch for each of the

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references is visually apparent in the below side-by-sides of Bielicki's ID unit/patch and the ID unit/patch in the Patch Rubber and Tire-Track Brochures. The interrelatedness of the documents is also evidence on their face.

Bielicki	Patch Rubber Brochure	Tire-Track Brochure
 (Bielicki, Fig. 1)	 (Patch Rubber Brochure, 3)	 (Tire-Track Brochure, 3)
Assignee (original): Tracking Systems LLC (Bielicki, cover page) Assignee (since 2004): Tire-Track, LLC “The unit or patch 10 is supplied by Patch Rubber Company” (Bielicki, 4:44-45)	 (Patch Rubber Brochure, 1) The complete system includes: • Tire-Track ID Units (Patch Rubber Brochure, 2 (annotated))  Tire-Track – Know Your Tires! Visit www.tire-track.com for more information. (Patch Rubber Brochure, 4 (annotated))	 (Tire-Track Brochure, 1) TIRE-TRACK, LLC has developed the TIRE-TRACK ID UNIT (Tire-Track Brochure, 2 (annotated))

228. The references also describe their ID units as having the same features. For example, Bielicki is directed to a “weather and wear resistant rubber ID unit for a tire with a selected pattern on the ID unit[.]” (Bielicki, Abstract.) Bielicki explains

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that “[i]t is an object of the present invention to provide a method for manufacturing a weather and wear resistant rubber identification unit for a tire with a selected pattern on the unit, and an identification unit made by that method.” (Bielicki, 2:28-31.) Bielicki explains that “[t]he method starts by providing the multi-layered rubber ID unit **10** which has an outer layer **13** of one color, e.g., white, and at least one inner layer **15** of a contrasting color, e.g. black” and “[t]here is also a [] bottom layer **17** beneath inner layer **15**, which acts as a bonding layer between the ID unit [10] and a tire.” (*Id.*, 3:30-35.) Bielicki also describes cutting “sharp and deep grooves ... through the full thickness of the white top layer **13**” so the black inner layer **15** is “made visible” and in the pattern of a barcode. (*Id.*, 3:43-54.) It states that ablating the patch in such a way “ensur[es] durability and wear and tear protection for the resulting pattern for maintaining accuracy and recognition.” (*Id.*, 2:11-25; *see also id.*, 2:32-37, 3:21-29.)

229. The Patch Rubber Brochure similarly explains that “The Tire-Track System starts with the Tire-Track ID Unit,” “[t]he Tire-Track ID is applied to the sidewall of each tire casing, and contains an engraved barcode” and “[t]he barcode is cut deeply into the rubber for permanent identification, so it cannot wear off.” (Patch Rubber Brochure, 3.) The Tire-Track Brochure likewise discloses that its ID unit “is a multi-layered black and white rubber label specifically designed for tires

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& other harsh environments. The bar code and other information is engraved through the white rubber to expose the contrasting black rubber; so there is no ‘paint’ or ink to rub off.” (Tire-Track Brochure, 3.)

230. The ID units are further described as being used for the same purpose: as a tire identification and tracking. (*See, e.g.*, Bielicki, 1:12-24 (“Tires are a source of high operating costs for most common carriers regardless of what they are shipping or carrying. A system is needed for tracking tire maintenance and predicting the life of a tire, as a preventative step for avoiding tire failures and reducing emergency roadside repair.”), 2:33-38 (“The unit can be used as part of a tire tracking, inventory and use system.”); Patch Rubber Brochure, 2 (“Tire-Track™ is a fully-integrated tire identification and tracking system that helps manage your fleet’s tires – to avoid failures, predict tire maintenance, and reduce emergency roadside repair.”); Tire-Track Brochure, 2 (“Whether you’re hauling freight or a bus load of first graders ... your cargo is valuable. However, that cargo won’t reach its destination if your fleet’s tires are not properly maintained and managed.... TIRE-TRACK, LLC has developed the TIRE-TRACK ID UNIT™ ... that serializes each tire with a unique identification number to work with your fleet maintenance or tire program.”).) The similarities in these disclosures—describing the same type of ID unit/patch, with the same configuration, and with the same purpose—alone would

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have provided the suggestion and motivation for a POSA to combine Bielicki, the Patch Rubber Brochure, and the Tire-Track Brochure.

231. Second, Bielicki and the Brochures extensively and consistently cross-reference each other, providing additional express motivation for combining their interrelated and overlapping teachings. In this regard, Bielicki states that “the unit or patch **10** is supplied by Patch Rubber Company/Myers Industries, Inc. of Roanoke Rapids, N.C.” (Bielicki, 4:44-45.) A POSA would have therefore been motivated to look to Patch Rubber Company documentation—including the Patch Rubber Brochure—for additional information about Bielicki’s ID patch and to supplement or implement details from that documentation with Bielicki to fill or confirm any gaps in Bielicki’s express disclosures. The Patch Rubber Brochure was maintained on the Patch Rubber Company website, along with a “Tire-Track Frequently Asked Questions” and “Tire-Track Overview” webpages directed to that same ID unit/patch and associated tracking system, which I understand could have been accessed prior to 2015 through the following Patch Rubber Company webpages disclosing the “Tire-Track Computerized Tracking System” (circled in red below):

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The image is a screenshot of the Patch Rubber Company website. At the top left, there is a 'Certified System' logo with 'ISO 9001' and a date 'June 15, 2012'. The company logo 'Patch Rubber Company' is centered at the top. Below it, the main heading is 'Tire Repair & Retreading Products', followed by a list of services: 'Puncture Repairs, Radial & Bias Section Repairs, Tube Repair Units, Tire Repair Chemicals, Retreading Materials, Materials for Repairing Passenger, Truck, Tractor, & Off-The-Road Tires'. The website features several product categories with corresponding images: 'Tire/Tube Repair Materials' (showing repair kits), 'Specialty Materials' (showing a barcode), 'Cements, Cleaners & Chemicals' (showing a can), 'Retread Materials' (showing a roll of rubber), 'Training & Repair Instructions' (showing a manual), and 'NEW Tire Puncture Repair Videos' (showing a video player). A 'Tire-Track Computerized Tracking System' is also highlighted with a red border. At the bottom, contact information is provided: 'Contact us: 100 Patch Rubber Road, Weldon, NC 27890, Phone: 252.536.2574, sales@patchrubber.com'. Navigation links for 'Contact', 'Legal', and 'About' are at the bottom center. The footer contains the copyright notice: '© 2001-2006 Patch Rubber Company / Myers Industries, Inc.'.

June 15, 2012

Certified System
ISO 9001

Patch Rubber Company

Tire Repair & Retreading Products
Puncture Repairs, Radial & Bias Section Repairs, Tube Repair Units,
Tire Repair Chemicals, Retreading Materials, Materials for Repairing
Passenger, Truck, Tractor, & Off-The-Road Tires

Tire/Tube Repair Materials

Specialty Materials

Cements, Cleaners & Chemicals

Retread Materials

Training & Repair Instructions

NEW Tire Puncture Repair Videos

Tire-Track Computerized Tracking System

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sales@patchrubber.com

Contact Legal About

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(EX1027, 30 (annotated).)

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The screenshot displays the Patch Rubber Company website. At the top, a blue header bar contains the phone number 252-536-2574. Below this, a navigation bar includes a 'Home' link, the company name 'Patch Rubber Company', and the company logo. A left-hand sidebar lists various product categories: Tire/Tube Repair Materials, Cements, Cleaners & Chemicals, Retread Materials, Specialty Materials, Training & Repair Instructions, Injury Application Charts, MSDS Sheets, Quality Control, and a Tire Patch Selector. The main content area is titled 'SPECIALTY MATERIALS' and features five product listings, each with an image, a title, and a description. The first listing, 'Tire-Track Computerized Barcode Tracking System', is highlighted with a red rectangular border. The other listings are 'Envelope Repair Kit', 'Quick Cure Tube Gum', 'Chem-Gum', and 'Black & Tan Rope Rubber'.

SPECIALTY MATERIALS

252-536-2574

Home | Patch Rubber Company

SPECIALTY MATERIALS

[Tire-Track Computerized Barcode Tracking System](#)
- Captures important information for tire fleets.

[Envelope Repair Kit](#)
- For permanent repairs to damaged precure envelopes.

[Quick Cure Tube Gum](#)
- Reduces repair times for tubes and tube replacement valves.

[Chem-Gum](#)
- Use for field service repairs. Compounded to cure chemically.

[Black & Tan Rope Rubber](#)
- Use to chemically cure spot repairs and industrial rubber products.
- Feed rope through an extruder gun to form a repair putty.

[Tire/Tube Repair Materials](#)
[Cements, Cleaners & Chemicals](#)
[Retread Materials](#)
[Specialty Materials](#)
[Training & Repair Instructions](#)
[Injury Application Charts](#)
[MSDS Sheets](#)
[Quality Control](#)
[Quality Control](#)
[Tire Patch Selector](#)
[Download Patch Catalog](#)
[Glossary](#)

(EX1027, 26 (annotated).)

232. The Rubber Patch Brochure expressly identifies “Tracking Systems LLC” on its cover, which is the same company identified on the cover of Bielicki, further demonstrating their interrelatedness and a further motivation to combine their respective teachings to gain a deeper understanding of Bielicki’s ID unit/patch and associated tracking system. (*Compare* EX1027, 95 *with* Bielicki, cover page.) Additionally, the Patch Rubber Brochure expressly directs users to the tire-track

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website: “Visit www.tire-track.com for more information”:



Tire-Track - Know Your Tires!
Visit www.tire-track.com for more information.

(EX1027, 98.)

233. In my opinion, a POSA being expressly instructed by the Patch Rubber Brochure to go to the tire-track website page for “more information” about the ID unit/patch and tracking system disclosed in Bielicki, provides a clear instruction motivating the combination of the Brochures together and with Bielicki. This provides, in my opinion, further confirmation that the patch in the Patch Rubber Brochure is the same as (or nearly identical to) Bielicki and the information in the Tire-Track Brochure can also be accurately relied on by a POSA to supplement the details in Bielicki, which further supports a reasonable expectation of success for this combination.

234. Bielicki’s assignment to Tire-Track LLC also would alone serve as express motivation for a POSA to look to Tire-Track LLC documentation—

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including the Tire-Track Brochure—for details about Bielicki’s patch and to supplement or implement details from that documentation into Bielicki to fill any gaps in Bielicki’s disclosure. This, coupled with the fact that the Patch Rubber Brochure points to the Tire-Track LLC website for “more information” about its ID unit/patch and tracking system (Patch Rubber Brochure, 4)—where the Tire-Track Brochure is the only document on the website describing a visually identical patch with the same name (“Tire-Track ID Unit”)—provides a POSA with clear evidence that these three references are inextricably linked and it would be more than reasonable for a POSA to rely on and combine features from these references together with a reasonable expectation of success.

235. Moreover, the respective “FAQ” sections on the webpages associated with each of the Brochures specifically identify that Patch Rubber Company and Tire-Track LLC “co-developed” the patches / ID units described in their Brochures. For example, the “FAQ” section for the ID Unit of Patch Rubber Brochure states that “[t]he Tire-Track ID Unit was co-developed by The Rubber Patch Company and Tracking Systems LLC [i.e., Tire-Track LLC]”:

2) What is the difference between the Tire-Track ID Unit and a silk-screened or ink printed label?

Silk-screened or ink printed tire identification labels have been available for some time. They are similar in that both products place "paint" or ink on the surface of the rubber. Although their initial appearance is very good, they can be easily damaged. Therefore, silk-screened or ink printed identification labels do not perform well and do not last in harsh environments. The Tire-Track ID Unit was co-developed by The Patch Rubber Company and Tracking Systems LLC. It is a multi-layer rubber "patch" specifically constructed to have a bar code cut into the rubber itself; therefore, there is no paint or ink to rub off. It resists UV light, which causes other white patches to turn brown. This "Brown-out" effect prevents a scanner from decoding a bar code. The Tire-Track ID Unit is specifically designed for harsh environments.

(EX1021, 1 (annotated); EX1027, 20.) Likewise, the "FAQ" page for the ID unit of the Tire-Track Brochure states that it was "co-developed by The Patch Rubber Company and TIRE-TRACK LLC":

Frequently Asked Questions About
The TIRE-TRACK ID UNIT

What is the difference between the TIRE-TRACK ID UNIT and a silk-screened or ink printed tire identification labels?

Silk-screened or ink printed tire identification labels have been available for some time. They are similar in that both products place "paint" or ink on the surface of the rubber. Although their initial appearance is very good, they can be easily damaged. Therefore, they do not perform well and do not last in harsh environments.

The TIRE-TRACK ID UNIT was co-developed by The Patch Rubber Company and TIRE-TRACK LLC. It is a multi-layer rubber "patch" specifically constructed to have a bar code cut into the rubber itself; therefore, there is no paint or ink to rub off. It resists UV light, which causes other white patches to turn brown. This "Brown-out" effect prevents a scanner from decoding a bar code. The TIRE-TRACK ID UNIT is specifically designed for harsh environments

(EX1019, 7 (annotated).) This further supports my conclusion that a POSA would

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have been motivated to combine these three interrelated references.

236. Given that Bielicki points to the exact product described in the Patch Rubber Brochure and further given that the Patch Rubber Brochure instructs one to go to the Tire-Track website containing the Tire-Track Brochure, a POSA would have had been a reasonable expectation of success in combining the teachings of these references since they are all directed to and describe the same underlying ID unit/patch product for use in a tire tracking system. As is apparent, there are multiple consistent and unambiguous cross-referencing and similarities between Bielicki and the Brochures that provide, in my opinion, an undeniable motivation to combine them with more than a reasonable expectation of success.

237. The Patch Rubber and Tire-Track Brochures are secondary references that I rely on to show how certain features that may not be expressly disclosed in Bielicki would have otherwise been obvious to or confirmed by a POSA based on their additional or supplementary express disclosures. For example, Bielicki discloses that its rubber ID “unit or patch” is bonded to a “tire.” (Bielicki, 3:30-35, 5:22-29, 4:44-55.) While in my opinion it would have been obvious that such an ID “patch” was suitable for being bonded to a vulcanized tire, Bielicki does not explicitly state that the tire to which it can be applied is a “vulcanized” tire (as opposed to necessarily being applied to an uncured/unvulcanized “green” tire during

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manufacture) or how the semi-cured gum rubber bonding layer can be chemically bonded to the tire. A POSA, however, could turn to the Patch Rubber Brochure to confirm these obvious expectations because it shows an ID unit/patch being applied onto a vulcanized rubber tire with a cement and notes that the ID Unit is “Appl[ied] the Tire-Track ID Unit just like a repair patch,” thereby confirming that Bielicki’s rubber patch is for use with a vulcanized tire and that the bonding layer is capable of chemically bonding with the tire by using a cement:

Outfit your entire fleet with no downtime!

The Tire-Track™ ID Unit can be applied to a new or used casing without removing the wheel or pulling the vehicle out of service. Tire-Track ID Units are not affected by the retreading process; the bond is actually improved.

*Apply the Tire-Track ID Unit just like a repair patch...**No Heat Required!***



Buff the tire surface.



Brush on cement.



Apply the Tire-Track ID Unit.

(Rubber Patch Brochure, 4.)

238. In a similar manner, Bielicki also discloses that that the “semi-cured gum rubber” is “used as a bonding layer between the ID unit **10** and a tire” (Bielicki, 5:25-28); however, although obvious, Bielicki does not explicitly state that the semi-

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cured gum rubber bonding layer “capable of chemically bonding” to the tire. A POSA would have been motivated to turn to the Tire-Track Brochure, which expressly discloses such chemical bonding—“It is vulcanized to the tire ‘just like a patch’ with cold-cure vulcanizing cement”—to confirm the chemical bonding of the semi-cured gum rubber to a vulcanized tire. (Tire-Track Brochure, 3.)

2. Independent claim 1

239. As an alternative to the single reference obviousness opinions set forth above under **Ground 3**, in this **Ground 4**, I combine Bielicki with the Patch Rubber Brochure and Tire-Track Brochure to render certain elements of claim 1 obvious. All **Ground 3** opinions under Bielicki alone for claim elements 1[a] and 1[b] (including both 1[b][i] and 1[b][ii]) are incorporated here and not repeated. Only claim elements subject to the express combination of Bielicki with the additional disclosures and teachings of the Patch Rubber Brochure and Tire-Track Brochure are discussed below. Specifically, to the extent that there is any question that claim elements 1[pre] and 1[c] are disclosed or rendered obvious by Bielicki alone under **Ground 3**, these claim elements are confirmed by the additional supplementary disclosures of the Patch Rubber Brochure and/or Tire-Track Brochure as set forth in this **Ground 4**.

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a. **Preamble: “An assembly for attachment with a vulcanized rubber article comprising:” (1[pre])**

240. As noted in **Ground 3** with respect to 1[pre], it is my opinion that Bielicki discloses (or at least renders obvious) the preamble “**an assembly for attachment with a vulcanized rubber article**” because a POSA would have understood that the “tire” in Bielicki is a “**vulcanized rubber article.**” However, to the extent there is any dispute about this and Bielicki alone is found not to disclose or render obvious claim element 1[pre] as it relates to Bielicki’s ID unit/patch being for attachment with a *vulcanized* rubber tire, Bielicki in combination with the additional supplementary disclosures of Patch Rubber Brochure and Tire-Track Brochure further demonstrates that the Bielicki’s multi-layered ID unit/patch is obviously for attachment with a vulcanized tire.

241. In this regard, the Patch Rubber Brochure depicts the ID unit/patch being applied to a vulcanized tire (see image excerpt below). A POSA knows the depicted tire is vulcanized just by looking at it and recognizing that the tire is not an uncured green tire during tire manufacturing. (See EX1015, 20-25; EX1017, 2-3; EX1022, 1-2; EX1014, 337.) Consistent with the identification of a vulcanized tire in the images, the Patch Rubber Brochure further states that the ID unit/patch is applied to a tire “just like a repair patch . . . No Heat Required” such that a POSA would recognize that the ID unit/patch (red annotation below) is “**an assembly for**

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attachment with a vulcanized rubber article,” just as it is depicted:

Outfit your entire fleet with no downtime!

The Tire-Track™ ID Unit can be applied to a new or used casing without removing the wheel or pulling the vehicle out of service. Tire-Track ID Units are not affected by the retreading process; the bond is actually improved.

*Apply the Tire-Track ID Unit just like a repair patch...**No Heat Required!***



Buff the tire surface.



Brush on cement.



Apply the Tire-Track ID Unit.

Tracking Systems LLC

Tire-Track – Know Your Tires!

Visit www.tire-track.com for more information.

(Patch Rubber Brochure, 4 (annotated).)

242. Additionally, the Patch Rubber Brochure indicates that “[t]he Tire-Track™ ID Unit can be applied to a new or used casing without removing the wheel or pulling the vehicle out of service.” (Patch Rubber Brochure, 4.) A POSA would understand that a tire on a vehicle “in service” would be a vulcanized tire and recognize that the Patch Rubber Brochure is indicating the application to such vulcanized tires without removing the tire from the wheel. (See EX1015, 20-25;

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EX1017, 2-3; EX1022, 1-2; EX1014, 337.) This only bolsters the depiction in the images in the Patch Rubber Brochure that the ID unit/patch is for attachment with a vulcanized rubber tire.

243. Similar to Bielicki and the Patch Rubber Brochure, the Tire-Track Brochure also discloses an ID unit/patch that “is specifically designed for tires and is constructed similar to a repair patch.” (Tire-Track Brochure, 3.) The Tire-Track Brochure further discloses that the ID unit “is vulcanized to the tire ‘just like a patch’ with cold-cure vulcanizing cement, or can be installed during the retread process.” (*Id.*) A POSA would have known (or at least found it obvious) that application “just like a patch” using a “cold-cure vulcanizing cement” meant the ID unit was for attachment with a vulcanized tire. Additionally, retreading is a process performed on vulcanized tires, such that the Tire-Track brochure’s mention that the ID unit can be “installed during the retread process” meant that the ID unit was for attachment to an already vulcanized tire. (*See* EX1015, 672.) Thus, in my opinion, the Tire-Track Brochure also discloses (or at least renders obvious) this preamble, which recites an **“assembly for attachment with a vulcanized rubber article.”**

244. A POSA also would have found it obvious to combine Bielicki with the Patch Rubber Brochure and/or Tire Track Brochure such that that ID unit/patch in Bielicki is attached to a vulcanized rubber tire, such as the one shown in the Patch

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Rubber Brochure. Bielicki already discloses that its patch is attached to a “tire.” The Brochures are relied on to further expressly disclose that the tire to which the ID unit/patch is attached is a vulcanized rubber tire. (Bielicki, Abstract, 1:12-32, 2:28-38, 3:21-35, 4:31-40, 5:22-35.) There is nothing about the description in Bielicki regarding its ID unit/patch with a semi-cured gum rubber bonding layer that would have indicated to a POSA that it could not or was not intended to be used for attachment to a vulcanized rubber tire. To the contrary, application using a “cement,” as disclosed in the Patch Rubber Brochure and Tire-Track Brochure, is how Bielicki’s ID unit/patch would be durably bonded to a vulcanized tire.

245. Accordingly, in my opinion, the preamble of claim 1 of the ’027 patent is disclosed by the combination under **Ground 4**.

b. Limitation 1[c]: “wherein the adhesive layer is formed from a material capable of chemically bonding with a surface of a vulcanized rubber article.”

246. This limitation is disclosed by Bielicki, Patch Rubber Brochure, and Tire-Track Brochure individually and collectively. As I discussed for limitation 1[c] under **Ground 3**, Bielicki discloses a semi-cured gum rubber bonding layer that is the claimed “**adhesive layer**” and it “**is formed from a material capable of chemically bonding with a surface of a vulcanized rubber article.**” However, to the extent there is any dispute about whether the bonding layer of Bielicki’s ID

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unit/patch satisfies this limitation, the Tire-Track Brochure and Patch Rubber Brochure disclose and render obvious that the ID unit/patch is “**capable of chemically bonding to a surface of a vulcanized rubber article.**”

247. The chemical bonding nature of the ID unit/patch is expressly disclosed in the Tire-Track Brochure: “It is *vulcanized to the tire* ‘just like a patch’ with cold-cure vulcanizing cement[.]” (Tire-Track Brochure, 3 (emphasis added).) By describing the ID unit/patch as being “vulcanized to the tire,” a POSA would understand that chemical bonds are formed with the tire and thereby further confirms that the semi-cured gum rubber bonding layer of Bielicki is a “**material capable of chemically bonding with the surface of the vulcanized rubber article**” (i.e., a vulcanized tire). (*See, e.g.*, EX1006; EX1014, 337-38; EX1015, 29; EX1013, 1.)

248. The Patch Rubber Brochure’s instructions for attaching a “Tire-Track ID Unit” to the sidewall of a tire includes brushing on a cement and then applying the unit to the area with the cement with “No Heat Required!” (Patch Rubber Brochure, 4.) In my opinion, it would have been obvious to a POSA that the application of cement for room temperature bonding of the ID unit/patch with Bielicki’s semi-cured gum rubber bonding layer also supports the obvious conclusion that the semi-cured gum rubber bonding layer is a “material capable of chemically bonding” in accordance with the Tire-Track Brochure’s description that

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it is a cold, chemical vulcanization bonding process. (*See, e.g.*, EX1006; EX1020, 3, 7.)

249. Thus, in my opinion, claim limitation 1[c] is disclosed by the combination under **Ground 4**.

250. Since all elements of claim 1 are disclosed and/or otherwise obvious by the combination of Bielicki, Patch Rubber Brochure, and Tire-Track Brochure, in my opinion the claim is invalid for obviousness under this **Ground 4**.

3. Dependent claims 2-3, 5, and 7

251. In my opinion, these claims are rendered obvious by Bielicki in view of the Patch Rubber Brochure and Tire-Track Brochure for the same reasons discussed for Bielicki alone under **Ground 3**. That is, I rely on the disclosures and teachings of Bielicki for the limitations recited in claims 2-3, 5, and 7 within this **Ground 4**.

4. Independent claim 11

a. Preamble: “A method for attaching an assembly to a surface of a vulcanized rubber article comprising the steps of:” (11[pre])

252. In my opinion, to the extent this preamble is limiting, it is disclosed by Bielicki in view of the Patch Rubber Brochure and Tire-Track Brochure for the same reasons I discuss for claim limitation 1[pre] under **Ground 3** and **Ground 4** above

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and the additional disclosures of the Patch Rubber Brochure. (*See also* Bielicki, 2:28-31 (“a method for manufacturing a weather and wear resistant ***rubber identification unit for a tire***”) (emphasis added), Abstract, 3:30-35, 4:31-40, 5:22-29, claim 5 (“a weather and wear resistant ***rubber unit for a tire***”) (emphasis added).) In this regard, the Patch Rubber Brochure illustrates steps in a method for attaching the ID unit/patch to a vulcanized rubber tire, which include buffing the tire surface, applying cement to the buffed area, and then applying the tire-track ID unit to the tire (see below). In my opinion, it would have been obvious to a POSA to implement these method steps with Bielicki’s disclosed ID unit/patch to a tire, as illustrated below: (Patch Rubber Brochure, 4; Bielicki, 4:44-45.)

Apply the Tire-Track ID Unit just like a repair patch...No Heat Required!



Buff the tire surface.



Brush on cement.



Apply the Tire-Track ID Unit.

(Patch Rubber Brochure, 4.)

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Apply the Tire-Track ID Unit just like a repair patch...**No Heat Required!**



Buff the tire surface.

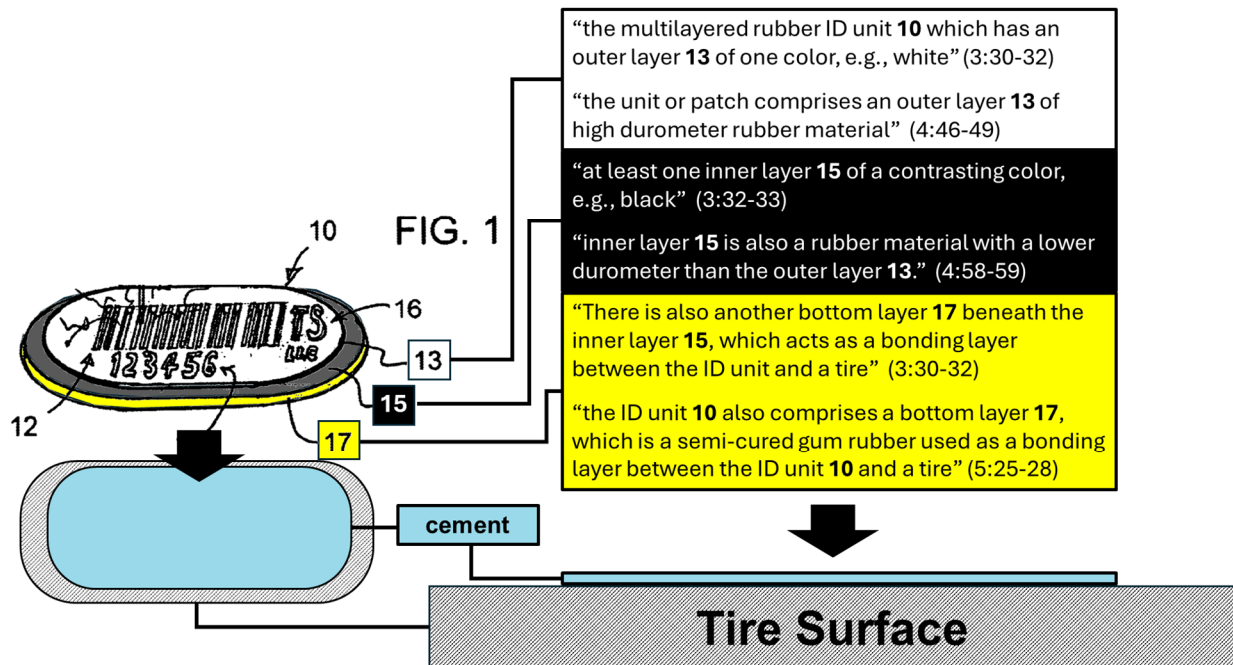


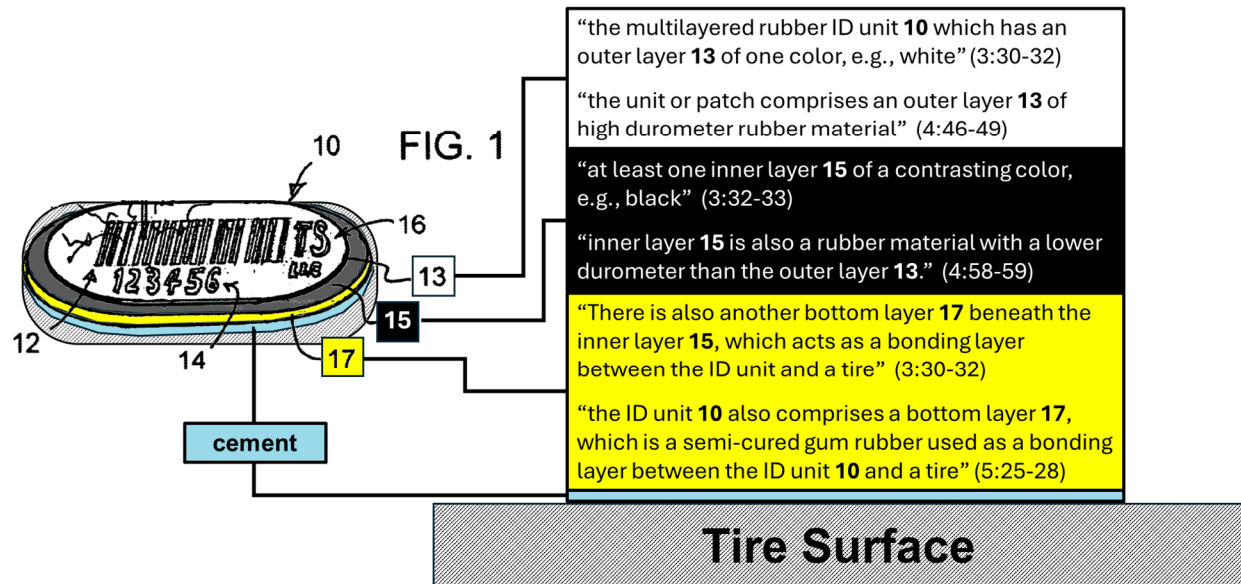
Brush on cement.



Apply the Tire-Track ID Unit.

253. Applying the teachings relating to Bielicki's ID unit/patch within the application method disclosed in the Patch Rubber Brochure results in the following combined teachings, depicting Bielicki's ID unit/patch 10 before and after it has been applied to a tire surface that has been buffed and rubber cement applied:





(Bielicki, Fig. 1 (annotated).)

b. Limitation 11[a]: “identifying a surface of a vulcanized rubber article;”

254. In my opinion, this is a prerequisite for attaching the ID unit/patch of Bielicki to a tire. Bielicki discloses that the bottom layer 17 of its patch “acts as a bonding layer between the [patch] and a tire.” (Bielicki, 3:30-35.) It is common sense that the location at which the patch is bonded to the tire would need to be identified before the patch is placed onto the tire and bonded to the tire. Indeed, a POSA would have understood that Bielicki’s ID unit/patch was intended to be applied to the tire sidewall, such that its barcode and identifying information could be readily accessed. This is further evidenced, in my opinion, by the fact that in its

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infringement contentions PO points to a single image of the accused dock already attached to a tire as evidence that this limitation is satisfied. (See EX1025, 86.)

255. The Rubber Patch Brochure also provides explicit steps for applying a patch to a tire, including identifying an area on the sidewall of a vulcanized rubber tire (annotated in red below) for buffing and applying cement to the buffed area where the ID unit/patch is attached to the tire. In my opinion, common sense dictates that this first requires “**identifying a surface**” of a tire (i.e., “**a vulcanized rubber article**”) to buff and then buffing that surface. The act of buffing and applying cement in and of itself are also acts of identifying the surface on which the ID unit/patch is to be bonded to the tire.

Apply the Tire-Track ID Unit just like a repair patch...No Heat Required!



Buff the tire surface.



Brush on cement.



Apply the Tire-Track ID Unit.

(Patch Rubber Brochure, 4 (annotated).)

256. It would have been obvious to a POSA to combine Bielicki with the Rubber Patch Brochure for additional detail regarding how the ID unit/patch is specifically meant to be bonded to the tire. All the reasons for combining these

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references discussed above also apply here.

257. Thus, in my opinion, limitation 11[a] is satisfied by **Ground 4**.

c. Limitation 11[b]: “placing an assembly into contact with the identified surface;”

258. In my opinion, this is another prerequisite for attaching the ID unit/patch to a tire. Again, it is common sense that Bielicki’s ID unit/patch (specifically its bottom layer 17) must be placed into contact with the tire surface for the patch to be bonded to that surface. (Bielicki, 3:30-35, 5:22-35.) The patch is a unit separate from the tire and is attached to the tire after manufacturing. Therefore, it necessarily must be placed on the tire for bonding to occur.

259. In the Patch Rubber Brochure image below, after preparing the tire surface, it instructs the technician to “apply” the ID Unit onto the prepared surface of the tire. (Patch Rubber Brochure, 4; *see also* Bielicki, 4:44-45.) “Applying” necessarily involves “placing.”

Apply the Tire-Track ID Unit just like a repair patch...No Heat Required!



Buff the tire surface.



Brush on cement.



Apply the Tire-Track ID Unit.

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(Rubber Patch Brochure, 4 (annotated).)

260. It would have been obvious to a POSA to combine Bielicki with the Patch Rubber Brochure so that more explicit steps for applying (or placing) the patch into contact with the identified tire surface (i.e., the surface that has been buffed and primed with cement) are implemented with Bielicki's ID unit/patch.

Apply the Tire-Track ID Unit just like a repair patch...No Heat Required!



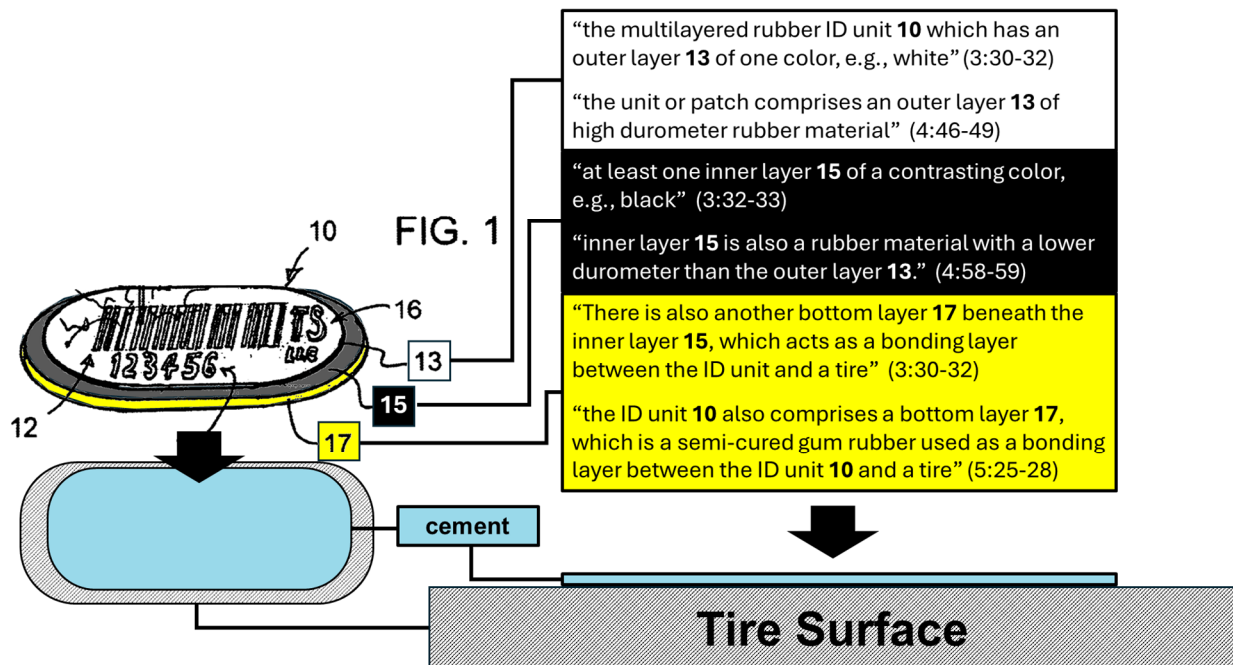
Buff the tire surface.



Brush on cement.

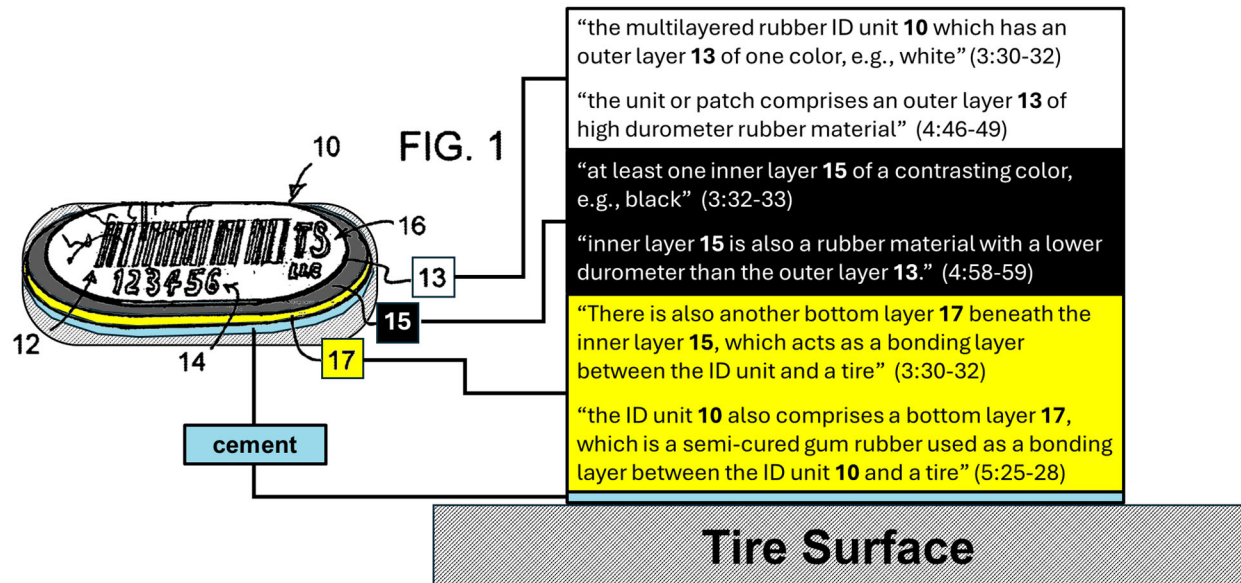


Apply the Tire-Track ID Unit.



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(Bielicki, Fig. 1 (annotated).)



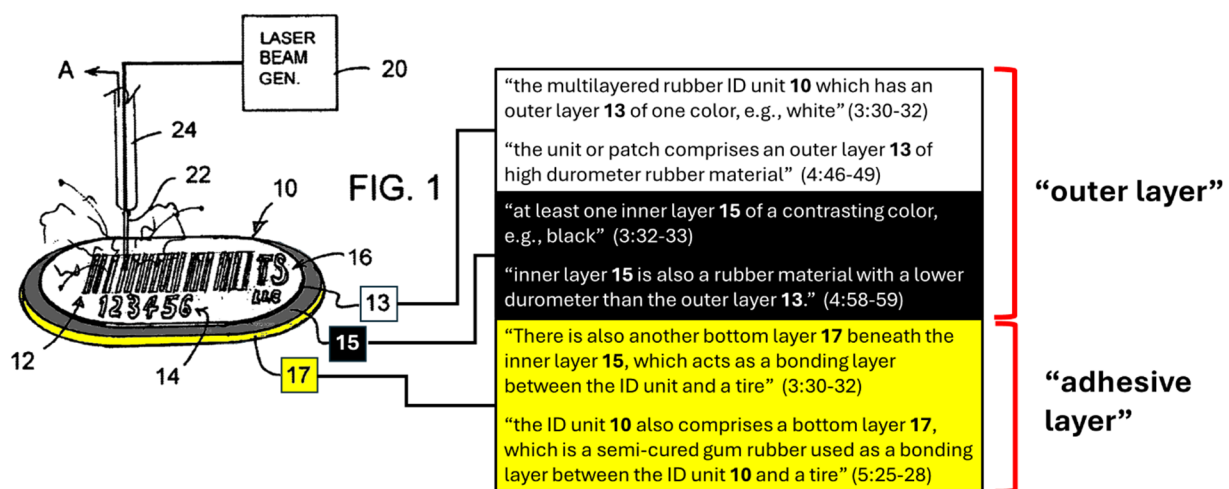
261. Furthermore, in its infringement contentions, PO points to a single image of the accused dock already attached to a tire as evidence that this limitation is satisfied. (See EX1025, 87.) Therefore, in my opinion, any evidence demonstrating an ID unit/patch is for attachment with a tire is sufficient to satisfy this limitation.

262. Thus, in my opinion, claim limitation 11[b] is satisfied by **Ground 4**.

- d. **Limitation 11[c]: “wherein the assembly comprises: an outer layer of elastomeric material, wherein the outer layer is in contact with an adhesive layer interposed between the identified surface and the assembly that bonds the assembly to the vulcanized rubber article, and”**

263. For the same reasons I discussed for limitation 1[a] under **Ground 3**, the outer layer 13 and inner layer 15 of Bielicki’s ID unit 10 collectively form the claimed **“outer layer of elastomeric material.”**

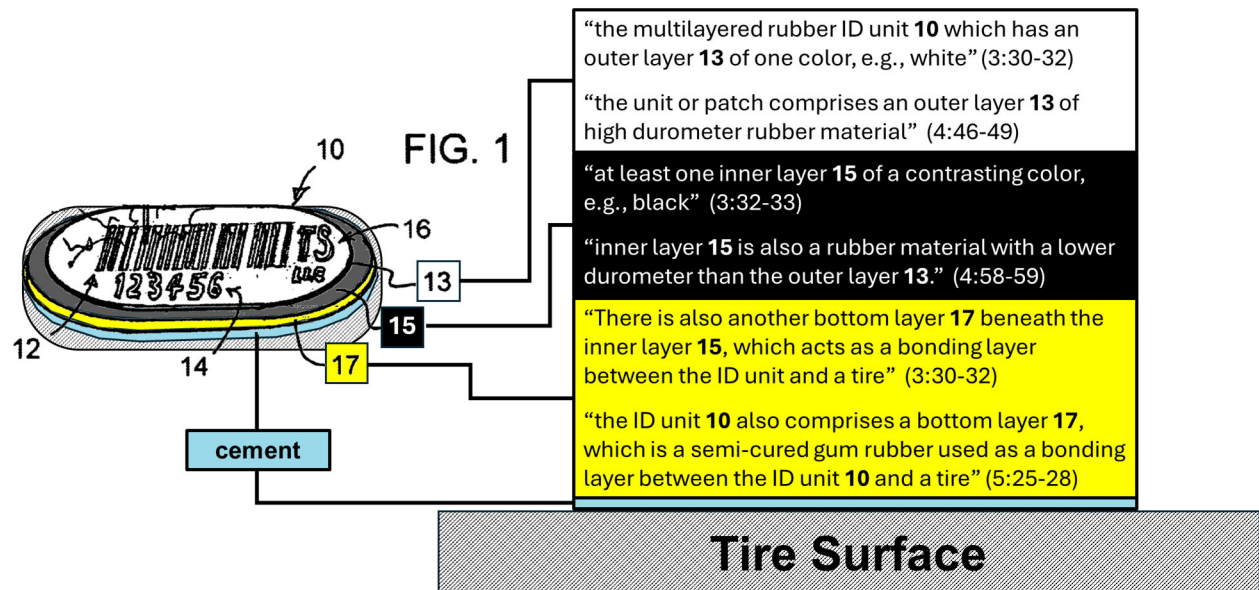
264. For the same reasons I discussed for limitation 1[b] under **Ground 3**, the bottom layer 17 of Bielicki’s ID unit/patch is the claimed **“adhesive layer”** and is **“in contact with”** the inner layer 15 (part of the **“outer layer”**), such that Bielicki satisfies the requirement that **“the outer layer is in contact with an adhesive layer.”** This is also illustrated below in Bielicki’s annotated Figure 1.



265. The next part of the limitation recites **“an adhesive layer interposed**

between the identified surface and the assembly that bonds the assembly to the vulcanized rubber article.” The application of Bielicki’s ID unit/patch onto the cement applied onto a tire surface according to the teachings of the Patch Rubber Brochure result in the cement and Bielicki’s semi-cure gum rubber bonding layer 17 being interposed between the identified tire sidewall surface and outer layer 13 and inner layer 15 of the ID unit/patch and bonding the ID/unit patch to the tire surface, as depicted below. A POSA would understand that the ID unit/patch would be bonded “just like a repair patch.” (Patch Rubber Brochure, 4.) Accordingly, in my opinion, the combination of Bielicki’s teachings regarding the ID unit/patch in view of the application method disclosed in Patch Rubber Brochure discloses the limitation of “**an adhesive layer interposed between the identified surface and the assembly that bonds the assembly to the vulcanized rubber article.”**

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(Bielicki, Fig. 1 (annotated).)

266. Indeed, this application of the combined teachings of Bielicki and Patch Rubber Brochure is consistent with how PO applied this limitation in its infringement contentions in the underlying district court litigation. (*See* EX1025, 95-96.) There, the accused product comprises only two parts – a dock and a cushion gum. As a single component alone—i.e., a dock—is not an “**assembly**” according to its plain and ordinary meaning, and it therefore follows that the “**assembly**” for claim 11 must include both the accused dock (as the accused “**outer layer**”) and the cushion gum layer (as the accused “**adhesive layer**”). This results in the cushion gum portion of the “**assembly**” being “**interposed**” between the tire surface and the “**assembly**” of which it is a part.

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267. To be clear, PO's infringement contentions point to the same elements for claim 11 as they do for claim 1, without any differentiation; so, in my opinion, it follows that any arguments for Bielicki that satisfies claim 1 would also satisfy claim 11 as follows. Thus, for the same reasons I discussed for limitation 1[b] under **Ground 3**, the semi-cured gum rubber bonding layer 17 of Bielicki's ID unit/patch is the claimed "**adhesive layer**" and is "**in contact with**" the inner layer 15 (part of the "**outer layer**") and this "**assembly**" would be interposed between Bielicki's ID unit/patch when it is placed onto the cement that has been applied to the tire according to the Patch Rubber Brochure, as follows:

Apply the Tire-Track ID Unit just like a repair patch...No Heat Required!



Buff the tire surface.



Brush on cement.



Apply the Tire-Track ID Unit.

(Patch Rubber Brochure, 4.)

268. Accordingly, in my opinion, **Ground 4** satisfies claim limitation 11[c].

e. **Limitation 11[d]: “wherein the outer layer comprises a barrier material composition to mitigate migration of material from the vulcanized rubber article.”**

269. In my opinion, this limitation is rendered obvious for the same reasons I discussed for limitation 1[b][ii] and dependent claim 5 under Bielicki in **Ground 3**. I incorporate those same opinions and evidence here.

270. Because all limitations of claim 11 are disclosed or would have been obvious from the combination of Bielicki, Patch Rubber Brochure, and Tire-Track Brochure, in my opinion claim 11 is invalid for obviousness.

5. Dependent claim 12

271. This claim depends from claim 11 and recites “*further comprising preparing the identified surface before the step of placing.*” This claim limitation is disclosed and rendered obvious by the Patch Rubber Brochure. As shown below, the Patch Rubber Brochure describes buffing the tire surface and brushing cement on the tire surface before the patch is applied. Each of these actions satisfies the claimed step of “**preparing the identified surface before the step of placing.**”

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Apply the Tire-Track ID Unit just like a repair patch...No Heat Required!



Buff the tire surface.



Brush on cement.



Apply the Tire-Track ID Unit.

(Patch Rubber Brochure, 4.)

272. As I discussed for this claim under **Ground 1** and **Ground 2**, preparing the tire surface before attaching a tire patch – such as cleaning or buffing – was standard practice in the art and would have advantageously resulted in a stronger bond between the patch and the tire. In my opinion, implementing the buffing and/or brushing steps from the Brochure into Bielicki would have therefore been straightforward and expected for these reasons, and those discussed throughout **Ground 4**.

273. It is therefore my opinion that Ground 4 renders claim 12 obvious.

6. Dependent claim 13

274. This claim depends from claim 11 and recites “*further comprising applying pressure to the assembly after the step of placing.*” Bielicki and the Patch Rubber Brochure render this claim obvious. For example, as shown at right, in the right-most image of the Patch Rubber Brochure (excerpted and annotated), the technician is holding a stitcher which is used to “stitch” the patch to ensure it is

securely attached to the tire and to work out any air bubbles that might form between the patch and the tire. (Patch Rubber Brochure, 4 (annotated).)

A POSA would understand that the stitcher requires the technician to apply pressure onto the



Apply the Tire-Track ID Unit.

ID unit/patch. This conclusion is consistent with the brief described in the '027 patent, which explains, that the use of a stitching tool involves the application of pressure. ('027 patent, 14:35-58 (“using a stitching tool, whereby moderate pressure is applied onto the display assembly by rolling the stitching tool over the entire surface area of the display assembly to ensure complete bonding and adherence between the display assembly and the vulcanized rubber article by the adhesive layer”) (emphasis added).)

275. In my opinion, it would have been obvious to implement this same step

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with Bielicki's disclosed ID unit/patch after applying it to the tire, as such stitching (with pressure) was expressly disclosed in the Patch Rubber Brochure and also because POSA would have known it would assist in ensuring intimate contact between the bonding layer 17 and the tire and to also assist in removing any air bubbles that may otherwise impair the bonding of the ID unit/patch to the tire. (*See, e.g.,* Wilson, 4:26-37 (describing stitching a patch to a tire and further clamping it "[t]o ensure a strong bond").) The same Patch Rubber Company manuals I point to for claim 12 showing buffing also show the use of a stitcher tool in each application, indicating that use of this tool was standard practice.

276. Thus, in my opinion, **Ground 4** renders claim 13 obvious.

7. Independent claim 15

a. Preamble: "A vulcanized rubber tire comprising:"

277. In my opinion, to the extent this preamble is limiting, it is rendered obvious by Bielicki and the Patch Rubber Brochure for the same reasons discussed for claim 1[pre] above and as depicted in the following image showing Bielicki's ID unit/patch substituted for the same Tire-Track ID Unit within the teachings of the Patch Rubber Brochure:

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Apply the Tire-Track ID Unit just like a repair patch...No Heat Required!



Buff the tire surface.



Brush on cement.



Apply the Tire-Track ID Unit.

(Patch Rubber Brochure, 4.)

b. Limitation 15[a]: “a target surface disposed along a portion of the rubber tire;”

278. In my opinion, this limitation is rendered obvious for the same reasons discussed for limitation 11[a] under this **Ground 4**.

c. Limitation 15[b]: “an assembly disposed onto the target surface and comprising:”

279. In my opinion, this limitation is rendered obvious for the same reasons discussed for limitation 11[b] under this **Ground 4**.

d. Limitation 15[c]: “an outer layer of elastomeric material; and”

280. In my opinion, this limitation is rendered obvious for the same reasons discussed for limitation 1[a] under **Ground 3**.

e. Limitation 15[d]: “an adhesive layer connected with the outer layer;”

281. In my opinion, this limitation is rendered obvious for the same reasons

discussed for limitation 1[b] under **Ground 3**.

- f. **Limitation 15[e]: “wherein at least a portion of the outer layer comprises a barrier material composition to mitigate migration of material from the rubber tire.”**

282. In my opinion, this limitation is rendered obvious for the same reasons discussed for limitation 1[b][ii] and claim 5 under **Ground 3**, and limitation 11[d] under this **Ground 4**.

8. Dependent claim 16

283. This claim depends from claim 15 and recites “*wherein the assembly further comprises a cavity disposed therein.*” In my opinion, this claim is rendered obvious for the same reasons discussed for claim 7 under **Ground 3**.

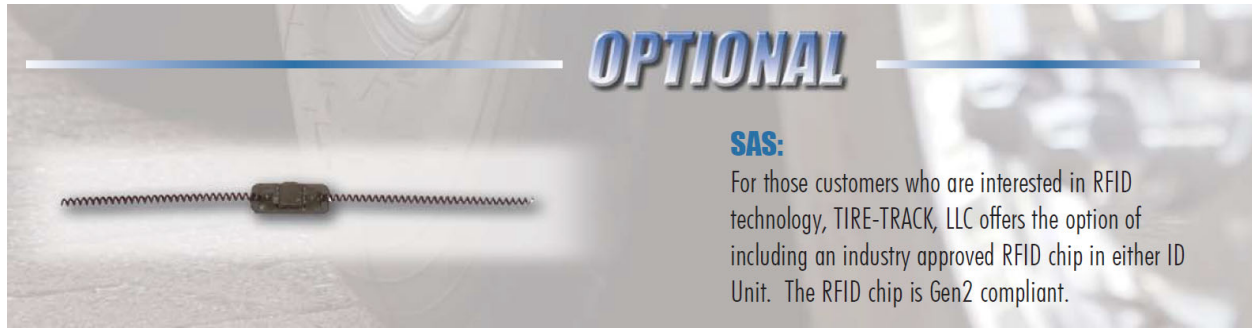
F. Ground 5: Claims 7-9, 14, 16-23 are rendered obvious by Bielicki in view of The Patch Rubber Brochure and/or the Tire-Track Brochure and Brown.

284. **Ground 5** is an extension of **Ground 4** in that it adds the Tire-Track Brochure’s teaching of the inclusion of an RFID chip within an ID unit/patch and Brown’s description for implementing a tire patch containing a transponder to address the challenged claims of this **Ground 5** that each recite a “cavity” and/or “element.”

285. The Tire-Track Brochure explains that an optional feature of the

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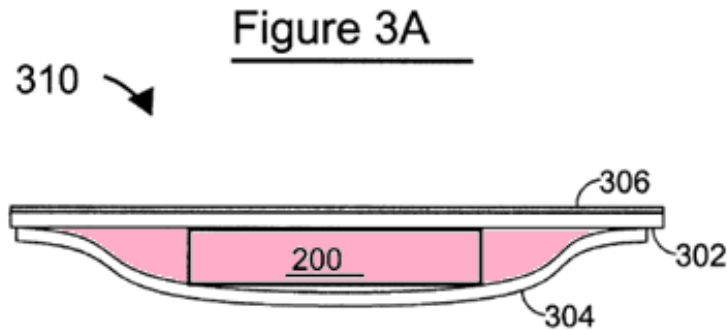
disclosed ID unit/patch is the inclusion of an “industry approved RFID chip” within the ID unit/patch:



(Tire-Track Brochure, 3.)

286. In my opinion, a POSA would have therefore found it obvious to include an RFID chip (i.e., an “**element**”) within the multi-layered ID unit/patch disclosed in Bielicki and the Tire-Track Brochure, as this was already expressly disclosed by the Tire-Track Brochure as an optional feature of the ID unit/patch.

287. Brown discloses a configuration for including a transponder module, akin to an RFID tag, within a multilayer patch for attachment to a tire. (Brown, Abstract, 17:51-65.) In the section entitled “An Exemplary Method of Mounting a Transponder Module in a Pneumatic Tire,” Brown discloses Figure 3A, which shows the transponder module 200 being “sandwiched” between two thin rubber sheets 302 and 304, with an adhesive layer 306. (Brown, 17:48-65.)



(Brown, Fig. 3A (annotated).)

288. Brown thus discloses an “**element**” (transponder 200) within a “**cavity**” (pink highlight) formed between the rubber sheets in which the transponder is “sandwiched.”

1. Dependent claim 7, 8, 16 and 17

289. Claims 7 and 16, which depend from independent claims 1 and 15 respectively, recite “*further comprising a cavity disposed therein.*” For this **Ground 5**, I rely on my opinions in **Ground 4** to demonstrate obviousness of independent claims 1 and 15 based on the combination of Bielicki, Patch Rubber Brochure, and the Tire-Track Brochure.

290. Claim 8, which depends from claim 7, recites “*further comprising an element disposed within the cavity.*” Claim 17, which depends from claim 16, similarly recites “*wherein an element is disposed within the cavity.*”

291. I understand that, in the underlying district court litigation, PO proposes

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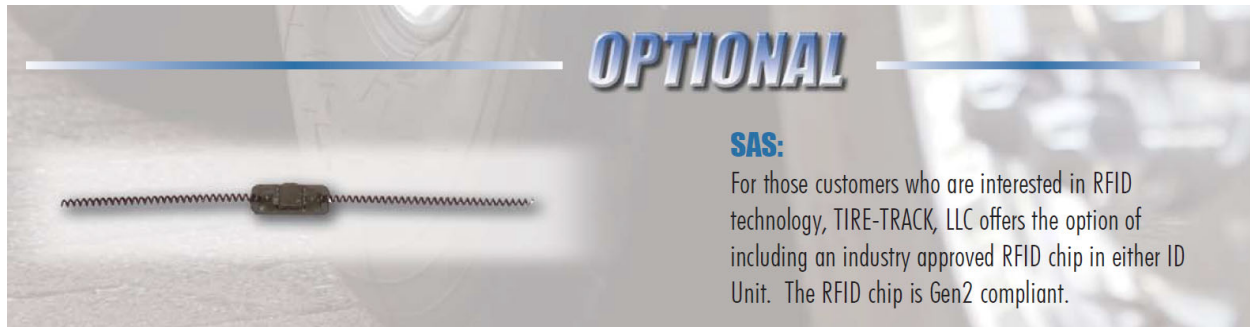
construing “**cavity**” as “a space for accommodating an element or object.” (EX1024, Ex. A at 3.) For the purposes of this Ground, I apply PO’s proposed construction.

292. As I discussed in section VII.E.1 of **Ground 4**, it is my opinion that a POSA would have been motivated to combine the teachings of Bielicki, Patch Rubber Brochure, and Tire-Track Brochure with respect to the ID unit/patch with a reasonable expectation of success. As I also noted in section VII.E.1 above, each of these references expressly cross-reference each other, further supporting a motivation to combine them with a reasonable expectation of success. (Bielicki, cover page (the assignee is Tire-Track LLC), 4:44-45 (patches come from the “Patch Rubber Company”); Patch Rubber Brochure, 4 (directs viewers to “[v]isit www.tire-track.com for more information” about the patch); EX1021, 1 (the “FAQ” webpage for the ID Unit of the Patch Rubber Brochure states that “[t]he Tire-Track ID Unit was co-developed by The Rubber Patch Company and Tracking Systems LLC.”); EX1019, 1 (the “FAQ” webpage for the ID Unit of the Tire-Track Brochure states that it was “co-developed by The Patch Rubber Company and TIRE-TRACK LLC.”).) I incorporate my opinions regarding the motivation to combine from **Ground 4** herein.

293. In addition to the shared overlapping disclosures of Bielicki, Patch Rubber Brochure, and Tire-Track Brochure relating to the ID unit/patch, the Tire-

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Track Brochure further explains that there is “the option of including an industry approved RFID chip in [the] ID Unit.” (Tire-Track Brochure, 3.) The Tire-Track Brochure includes an image of the chip, which is reproduced below:



(Tire-Track Brochure, 3.)

294. I am familiar with chips like this and their use in tire patches. The coiled “arms” extending from the chip is an antenna.

295. The Tire-Track Brochure does not provide details about where this RFID chip is installed within the ID Unit. Nevertheless, in my opinion, a POSA would have understood that the RFID chip (and its antenna) must be installed *below* the colored layers forming the barcode so as not to obscure the barcode. More specifically, placing the chip between the white and black layers would result in the chip being exposed through the cuts made into and through the white outer layer of the ID unit and would block parts of the black layer from being visible. This would not only interfere with the functionality of the barcode, it would also expose the chip to damage during manufacturing and expose the chip to the elements by having a

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direct exposure to the outside harsh environments through the engrave barcode and other identification engravings on the ID unit/patch. Of course, these same drawbacks would also be true if the chip were mounted on the outer surface of the ID Unit.

296. As such, a POSA would have understood and found it obvious that the RFID chip included within the ID unit/patch in as disclosed in the Tire-Track Brochure would be placed within the multi-layered unit in a location where it is not subjected to the external environment and would not be exposed to damage during the cutting of the bar code into the ID unit/patch. Thus, a POSA would have found it obvious that the RFID chip of the ID unit/patch in the Tire-Track Brochure would be located *below* both of the black and white layers that together form the white and black layers for the engraved bar code.

297. In my opinion, a POSA would have found it obvious that the disclosed RFID chip would be located within the multilayer ID unit/patch of Bielicki and the Tire-Track Brochure either directly above or directly below the semi-cured gum rubber bonding layer, such as disclosed by Parsons. (EX1011.) Parsons discloses labels for mounting to vulcanized tires, noting that such tire labels regularly carry bar codes or other identifying indicia, and further discloses using the label “for affixing a RFID (radio frequency identification) tag to a tire, including a base layer,

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U.S. Patent No. 11,124,027 B2

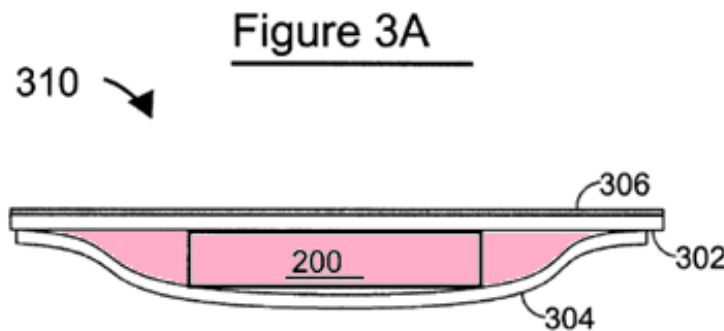
an adhesive layer, and a RFID tag disposed in contact with the adhesive layer. (EX1011, [0001], [0004], [0008].) Parson discloses that the RFID tag can be interposed between the base layer and the adhesive layer (*id.*, [0019]) or on the bottom surface of the adhesive layer such that it will be interposed between the adhesive layer and the tire surface (*id.*, [0021].)

298. A POSA would therefore have recognized that one obvious placement location for the RFID chip within the Bielicki/Tire-Track ID unit/patch would be to place the RFID chip beneath the black layer of the barcode and then cover it with the semi-cured gum rubber bonding layer, such that when the patch is attached to a tire the RFID chip is disposed below black inner layer 15 and above the bonding layer 17. This obvious configuration for the placement of the RFID chip within the ID unit/patch of Bielicki/Tire-Track Brochure is generally shown in Parsons, Fig. 2. (EX1011, Fig. 2.)

299. A POSA would thus have recognized and found obvious to place the RFID chip within the Bielicki/Tire-Track ID unit/patch for mounting to a tire by “sandwiching” the chip between the rubber layers—i.e., between the ID unit/patch’s black rubber barcode layer and the gum rubber adhesive bonding layer (for the reasons discussed above). This obvious way of including an RFID tag within a tire using a patch is shown in Brown, which is relied on here for **Ground 5**.

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300. A POSA would have been motivated to look to Brown because it is a complimentary tire patch reference that discloses a patch with a “transponder module **200** being ‘sandwiched’ between two thin sheets **302** and **304**, such as rubber sheets[.]” (Brown, 17:58-65; *see also id.* Fig. 3A below.) A POSA would have recognized that this teaching from Brown would have been well-suited for mounting the RFID tag in the Bielicki/Tire-Track ID unit/patch because it likewise has a multi-layered configuration and could readily be applied to form a “sandwiched” RFID between Bielicki’s black inner layer and bottom rubber gum bonding layer.



(Brown, Fig. 3A (annotated).) In my opinion, Brown teaches a “**cavity**” (pink highlight) that is a space for accommodating and an “**element**” (transponder 200).

301. In my opinion, it would have been obvious to combine Bielicki with the Tire-Track Brochure so that the ID unit/patch in Bielicki includes an RFID chip (or similar “**element**”). Including an RFID chip would enhance the functionality of Bielicki’s ID unit/patch, allowing it to more readily provide information about the

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tire via radio identification and would improve its tire tracking system. (Bielicki, 2:33-38 (the patch “can be used as part of a tire tracking, inventory and use system”).) Bielicki and the Tire-Track Brochure describe the same (if not nearly identical) ID unit/patch and are commonly owned/assigned; therefore, it would have been obvious to try combining these references.

302. It would have further been obvious to combine Bielicki and the Tire-Track Brochure with Brown for placement of the RFID chip as being sandwiched between the inner layer 15 and semi-cured bonding layer 17, as a direct and straightforward way to include the RFID chip within the ID unit/patch. As I mentioned before, it was well known for tire patches to include RFID chips. (*See, e.g., Parsons.*) A POSA would have understood that any improved features or functionality described in the Tire-Track Brochure could be implemented in Bielicki to yield predictable results.

303. Because Bielicki is assigned to Tire-Track LLC, a POSA would have known to look to the Tire-Track Brochure (and other related documentation), for improvements or modifications to the patch and would have been motivated to implement those improvements/modifications into Bielicki’s ID unit/patch and would have had an expectation of success in doing so. This combination is further motivated by the reasons previously discussed related to the ownership and

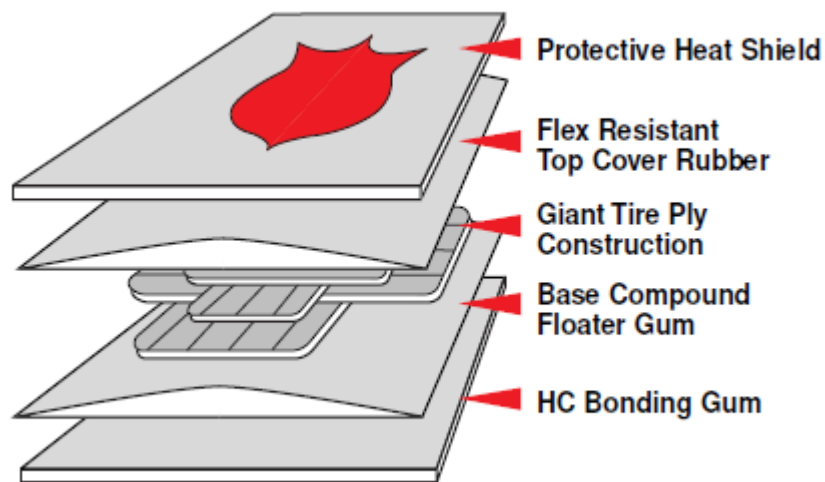
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similarities between Bielicki and the Tire-Track Brochure.

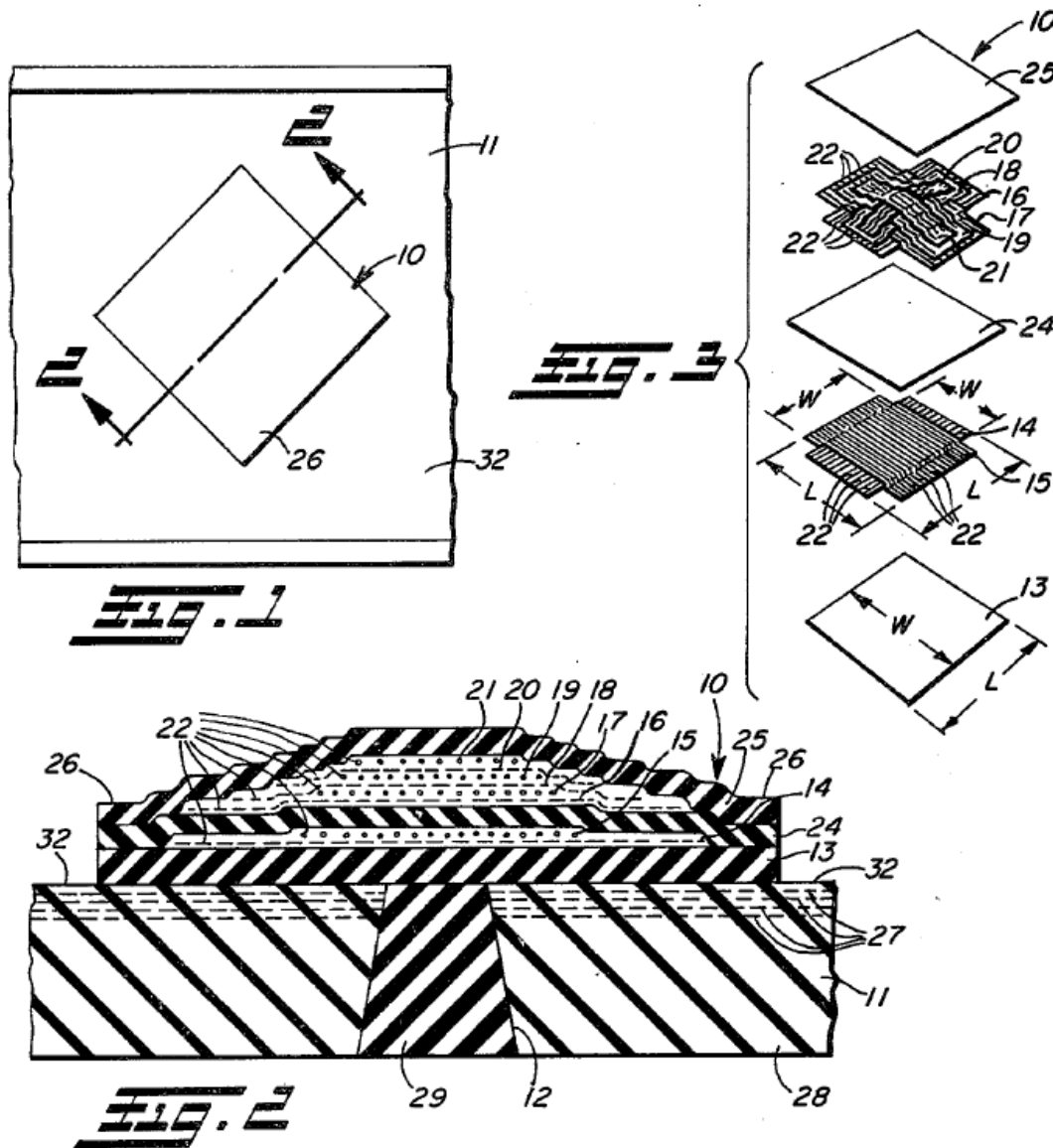
304. A POSA would have also had a reasonable expectation of success in following the general teachings of Brown such that Bielicki's ID unit/patch would include a "**cavity**" with an RFID chip (or similar "**element**") disposed therein. The cavity can be formed in any suitable manner, such as, for example, by "sandwiching" various layers in Bielicki's patch around the chip, as described in Brown. (Brown, 17:58-65.) For example, the chip can be disposed in a cavity formed between the black inner layer 15 and the bottom layer 17, between "other layers" and the bottom layer 17, between the inner layer 15 and "other layers," between multiple inner layers 15 or the like. (See Bielicki, 3:30-35 ("at least one inner layer **15**"), 5:30-35 ("other layers between the inner layer **15** and the bottom layer **17**").) A POSA would have understood that the RFID chip could be mounted into the ID unit/patch during assembly of the unit, such as by placing the RFID chip between the semi-cured gum rubber bonding layer 17 and the black inner layer 15 when the unit or patch is initially assembled into a multi-layered unit. A POSA would have had a reasonable expectation of being able to do so because the Tire-Track Brochure indicates that the ID unit/patch can have an RFID chip and the placement of the RFID chip into this step of the process for assembling the RFID chip between gum rubber layer and the black inner layer would only require routine skill that would have been common

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for including elements within multi-layered patches, such as, for example, the inclusion of cords and supporting elements within ply layers of tire repair patches located above a gum rubber layer and an outer covering rubber layer, like those made and sold by the Patch Rubber Company and disclosed in DiRocco:



(EX1027, 82.)



(DiRocco, Figs 1-3.)

305. It was also common at the time of the '027 patent for tire patches to include cavities with RFID chips (or other tracking elements), as described in the Tire-Track Brochure for the Bielicki/Tire-Track ID unit/patch. For instance, Wilson disclosed a similar tire patch that houses an electronic monitoring device within its

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cavity back in 2002. Parsons, the reference I mentioned above showing an alternative method for housing a chip on a tire patch, is another example with a 2003 filing date. A POSA would have had knowledge of these products, their features and benefits, and configuration prior to the April 2015 priority date of the '027 patent.

306. Accordingly, in my opinion, the Tire-Track Brochure's teaching of an RFID chip within the ID unit/patch of Bielicki, Patch Rubber Brochure, and the Tire-Track Brochure in further combination with the obvious use of Brown's mounting method of "sandwiching" the RFID chip between the black inner layer and semi-cured gum rubber bonding layer satisfies the "**cavity**" of claims 7 and 16 and the "**element disposed within the cavity**" of claims 8 and 17. Thus, in my opinion, claims 7, 8, 16, and 17 are obvious under **Ground 5**.

2. Dependent claims 9 and 18

307. Claim 9 depends from claim 7 and claim 18 depends from claim 16. They recite "***wherein the cavity is disposed beneath the outer layer.***" As explained directly above, when Bielicki is further modified by the Tire-Track Brochure and Brown to include a RFID chip sandwiched between the black inner layer and semi-cured gum rubber bonding layer, it would have been obvious that Bielicki's ID unit/patch incorporating the RFID chip of the Tire-Track Brochure would include a "**cavity [that] is disposed beneath the outer layer.**" Thus, in my opinion, claims

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89 and 18 are obvious under Ground 5.

3. Independent claim 19

a. Preamble: “An assembly for attachment to a vulcanized rubber tire comprising:”

308. In my opinion, to the extent this preamble it is limiting, it is rendered obvious for the same reasons discussed for the preamble of claim 1 under **Ground 4.**

b. Limitation 19[a]: “an outer layer formed from an elastomeric material;”

309. This limitation is rendered obvious for the same reasons discussed for limitation 1[a] under **Ground 3.**

c. Limitation 19[b]: “an adhesive layer bonding the assembly to portion of a vulcanized rubber tire; and”

310. This limitation is rendered obvious for the same reasons discussed for limitation 1[c] and 11[c] under **Ground 4.**

d. Limitation 19[c]: “a cavity disposed within the assembly for accommodating an element therein;”

311. This limitation is rendered obvious for the same reasons discussed for claims 7 and 8 under this **Ground 5.**

- e. **Limitation 19[d]: “wherein the outer layer comprises a material composition that acts as a barrier to material migrating from the vulcanized rubber tire.”**

312. This limitation is rendered obvious for the same reasons discussed for limitations 1[b][ii] and claim 5 under **Ground 3** and limitation 11[d] under **Ground 4**.

4. Dependent claim 20

313. This claim is rendered obvious for the same reasons discussed for claim 9 under this **Ground 5**.

5. Dependent claim 21

314. This claim is rendered obvious for the same reasons discussed for limitation 1[b][i] under **Ground 3**.

6. Dependent claim 22

315. This claim is rendered obvious for the same reasons discussed for limitation 1[a] under **Ground 3**.

VIII. NO SECONDARY CONSIDERATIONS OF NONOBVIOUSNESS

316. I understand from counsel that the Patent Owner in the underlying district court litigation has not yet identified any evidence with respect to secondary considerations of non-obviousness or that any potential considerations have a *nexus*

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to the merits of and is commensurate in scope with any of the inventions claimed in the '027 patent.

317. To the extent Patent Owner cites any evidence of sales or any praise or any industry recognition of products that Patent Owner asserts to implement the claimed invention, I am not aware of any information demonstrating that any increased sales, commercial success, praise, or any other secondary factor (that Patent Owner may assert) was a result of *the particular features recited in the '027 patent's claims*. Since Patent Owner has not yet identified any evidence of secondary considerations, Patent Owner cannot demonstrate that the limitations of the claimed invention in particular, as opposed to other features of the products at issue, were the factors that caused any increased sales, praise, or any other asserted secondary considerations.

318. Thus, based on my review of the evidence to date, I can summarize my opinions regarding any alleged secondary considerations of non-obviousness relating to the '027 patent, as follows:

319. *No commercial success of the claimed invention.* Patent Owner has not cited any evidence of particular commercial success of products embodying the '027 patent as opposed to products that do not embody the '027 patent. Patent Owner has not cited any evidence that any commercial success of any products is particularly a

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result of the claimed inventions recited in the ‘027 patent’s claims and not due to any other facts.

320. *No long-felt but unsolved need.* Patent Owner has not cited any evidence of any long-felt need that remained unsolved in the prior art before the ‘027 patent. To the contrary, as discussed above, the prior art solved the problems that the ‘027 patent purported to address.

321. *No failure of others.* Patent Owner has not cited any evidence of anyone who tried, but failed, to solve the problems addressed by the ‘027 patent. As shown by my analysis above, there existed prior art references that successfully disclosed and rendered obvious the subject matter claimed by the ‘027 patent.

322. *No copying of the claimed invention.* Patent Owner has not cited any evidence that any other party (including Petitioner or third parties) ever copied from the ‘027 patent and its claimed invention.

323. *No unexpected results of the claimed invention.* Patent Owner has not cited any evidence of unexpected results achieved by the ‘027 patent’s claimed invention. To the contrary, the prior art disclosed the predictable, expected results that show why the ‘027 patent’s claims are obvious as discussed in my Declaration.

324. *No praise for the claimed invention.* Patent Owner has not cited any evidence of praise for the claimed invention recited in the ‘027 patent.

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325. *No surprise or skepticism at the claimed invention.* Patent Owner has not cited any evidence that observers were surprised by, or skeptical of, the claimed invention recited in the '027 patent.

326. *No departure from the wisdom of the prior art.* Patent Owner has not cited any evidence that the claimed inventions of the '027 patent departed from the wisdom of the prior art. The '027 patent claims subject matter that was already present in the prior art, including in the references discussed in my Declaration.

327. Moreover, with respect to the considerations discussed above, I also refer to and incorporate my opinions stated throughout this Declaration, including my analysis showing that the '027 patent is directed to techniques known in the prior art and does not provide any inventive technology.

328. To the extent Patent Owner at a later date cites or provides any other evidence regarding secondary considerations, including any expert opinions, I reserve the right to supplement my analysis and opinions to comment on it.

IX. CONCLUSION

329. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in this proceeding. If required, I will appear for cross-

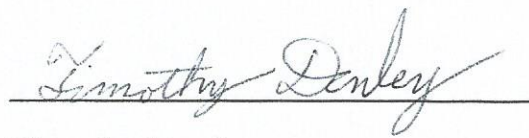
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examination at the appropriate time.

329. I hereby declare that all statements made herein of my own knowledge are true and that all statements are made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

Respectfully submitted,

Dated: February 20, 2025


Timothy Donley

APPENDIX A

Timothy M Donley

Work Experience

Retired from Patch Rubber in June of 2023

Over 30 years experience in the Rubber Industry with most of the experience in development.

Over 20 years experience in the Tire Industry with 13 years in tire development.

6/15 – 6/23 Patch Rubber Roanoke Rapids, NC
Director of Engineering

- Investigate and administrate research & development projects.
- Oversaw development of new chemical patch
- Consulted on formulas for rugged small aircraft tire
- Consulted on design and curing of pipe plugs

7/02 - 6/15 Cooper Tire Findlay, OH
Advanced Engineer 6/12 - 6/15

- Project Manager of \$1.5 million Department of Energy Grant for Tire Low RR Development
 - Coached and developed new engineers.
 - Compounded low hysteresis formulas thru new polymer and filler.
 - Developed production processing for each new application.
 - Researched and developed aramid cord as steel belt replacement.
 - Established and maintained program budget.
 - Oversaw computer design modeling of tire structure for low RR.

Director of Materials Application Development - China 3/09 - 6/12

- Developed Materials Group in the Asia Technical Center in Shanghai, China.
- Identified and coordinated development of new products for the Asia market.
- Coordinated compound development for car tires and truck tires.
- Established new test equipment requirements and test procedures.

Manager Composites and Composite Compounding 11/06 - 3/09

- Directed compound development for TBR compounds and composites.
- Investigated new and improved reinforcement materials.

Leader Tread and Base Development 5/05 - 11/06

- Directed tread and base development.
- Develop silica tread mixing strategy.

Senior Materials Development Engineer 7/02 - 5/05

- Developed tread and base compounds.
- Worked with plants to resolve issues with tread and base processing.

2/99 - 7/02 Oliver Rubber (Cooper Tire) Asheboro, NC

Chemist

- Maintained and developed EPDM compounds within customer specifications.
- Investigated and resolved issues experienced in mixing and extrusion.
- Developed compounds for custom mixing applications.

4/92 - 2/99**Pretty Products****Coshocton, OH****Chief Chemist****8/96 - 2/99**

- Responsible for development and processing of rubber compounds.
- Developed processing and formulas for new products.
- Established test specifications for compounds.
- Investigated and Identified new equipment to upgrade production processes.

Compounder**4/92 - 8/96**

- Developed compounds to meet customer specifications.
- Formulated colored rubber formulations.
- Worked on implementation team for QS-9000.

Skills

Proficient with Excel and Word and Powerpoint.

Data driven decision making.

Project leader.

Six Sigma and Green Belt training.

Education**University of South Florida****Tampa, FL****Bachelor of Science in Chemical Engineering**