

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Owens Corning,
Petitioner

v.

CertainTeed Corporation,
Patent Owner

Patent No. 8,615,968

Issued: December 31, 2013

Filed: April 3, 2013

Inventors: Husnu M. Kalkanoglu and Stephen A. Koch

Title: SHINGLE WITH REINFORCEMENT LAYER

Inter Partes Review No. 2014-01404

PETITION FOR INTER PARTES REVIEW

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Petition for *Inter Partes* Review of U.S. Patent No. 8,615,968

Attachment A. Proof of Service of the Petition

Attachment B. List of Evidence and Exhibits Relied Upon in Petition

I. Compliance with Requirements of an *Inter Partes* Review Petition

A. Certification that the Patent May Be Contested via *Inter Partes* Review by the Petitioner

Petitioner certifies it is not barred or estopped from requesting *inter partes* review of U.S. Patent No. 8,615,968 (“the ’968 patent”) (Ex. 1038). Neither Petitioner, nor any party in privity with Petitioner: (i) has filed a civil action challenging the validity of any claim of the ’968 patent; or (ii) has been served a complaint alleging infringement of the ’968 patent more than one year prior to the present date. Also, the ’968 patent has not been the subject of a prior *inter partes* review or a finally concluded district court litigation involving Petitioner.

Petitioner also certifies this petition for *inter partes* review is filed in compliance with 35 U.S.C. § 315(b). Petitioner Owens Corning was served a complaint alleging infringement of the ’968 patent on April 22, 2014 resulting in Civ. A. No. 1:14-cv-00510-SLR (D. Del.). Ex. 1045 (Complaint).

B. Fee for *Inter Partes* Review (§ 42.15(a))

The Director is authorized to charge Deposit Account No. 50-1597.

C. Mandatory Notices (37 CFR § 42.8(b))

1. Real Party in Interest (§ 42.8(b)(1))

The real party in interest is Owens Corning, located at One Owens Corning Parkway, Toledo, OH 43659.

2. Other Proceedings (§ 42.8(b)(2))

The '968 patent is the subject of litigation in the District of Delaware (Civ. A. No. 1:14-cv-00510-SLR), which names Owens Corning as defendant. *See* Ex. 1045. Patents related to the '968 patent, by continuation, are the subject of petitions for *inter partes* review filed concurrently herewith (IPR Nos. 2014-01397, -01401, -1402, -1403).

3. Lead and Backup Lead Counsel (§ 42.8(b)(3))

<u>Lead Counsel</u> Jeffrey P. Kushan Reg. No. 43,401 jkushan@sidley.com (202) 736-8914	<u>Backup Lead Counsel</u> Peter S. Choi Reg. No. 54,033 peter.choi@sidley.com (202) 736-8076
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4. Service on Petitioner

Service on Petitioner may be made by mail or hand delivery to: Sidley Austin LLP, 1501 K Street, N.W., Washington, D.C. 20005. The fax number for Petitioner's counsel is (202) 736-8711.

D. Proof of Service (§§ 42.6(e) and 42.105(a))

Proof of service of this petition is provided in **Attachment A**.

II. Identification of Claims Being Challenged (§ 42.104(b))

Claims 1–18 of the '968 patent are unpatentable. Specifically:

- (1) Claims 1–2, 6–12, and 14–16 are anticipated under § 102(b) by Venrick 1939.
- (2) Claims 3–5, 13, and 17–18 would have been obvious under § 103

based on Venrick 1939.

- (3) Claims 1–18 would have been obvious under § 103 based on Venrick 1939 in view of Frankoski 1998.
- (4) Claims 1–18 would have been obvious under § 103 based on Venrick 1939 in view of Kiik 2001.

Petitioner’s proposed claim construction, the evidence relied upon, and the precise reasons why the claims are unpatentable are provided below. A list of evidence relied upon in support of this petition is set forth in **Attachment B**.

III. Relevant Information Concerning the Contested Patent

A. Background of the Technology

1. The Basic Asphalt Shingle Coated on Both Sides with Asphalt and Granules Had Been Known for Decades

Asphalt shingles have been used to cover roofs since the late-1800s. *See, e.g.,* Ex. 1005, Cash, “Asphalt Roofing Shingles,” Proc. 11th Conf. Roofing Tech. (1995) (Cash 1995), at 1; Ex. 1003 (Bryson Decl.), at ¶ 46. By the mid-1990s, three styles predominated: (1) the individual shingle; (2) the strip shingle (with or without tabs), and (3) the laminated shingle. Ex. 1005 (Cash 1995), at Figs. 10–12; Ex. 1003 (Bryson Decl.), at ¶¶ 46-47.

Asphalt waterproofs the shingle. Ex. 1007, Noone, “Asphalt-Shingles – A Century of Success and Improvement,” Proc. 11th Conf. Roofing Tech. (1993) (Noone 1993), at 2; Ex. 1003 (Bryson Decl.), at ¶ 48. In general, making an asphalt shingle involves passing a base mat through a coater, where layers of hot

asphalt are applied to the top and back surfaces. Ex. 1007 (Noone 1993), at 2; Ex. 1003 (Bryson Decl.), at ¶ 48. Colored or non-colored granules are then dropped on the front surface and other granular materials are applied to the back. Ex. 1007 (Noone 1993), at 2, 5; Ex. 1003 (Bryson Decl.), at ¶ 48. The granular material on the front adds color and texture. Finely ground talc and sand or other granular materials are added on the back to prevent sticking during storage and shipment. Ex. 1007 (Noone 1993), at 2, 5-6; Ex. 1003 (Bryson Decl.), at ¶ 48.

The basic steps for making an asphalt shingle, including coating both sides of the base mat (*i.e.*, substrate) with asphalt and applying granular material on both sides, have remained the same for decades. Ex. 1003 (Bryson Decl.), at ¶¶ 49-50. U.S. Patent No. 2,099,131 to Miller (issued in 1937) (Miller 1937) (Ex. 1008) states, for example:

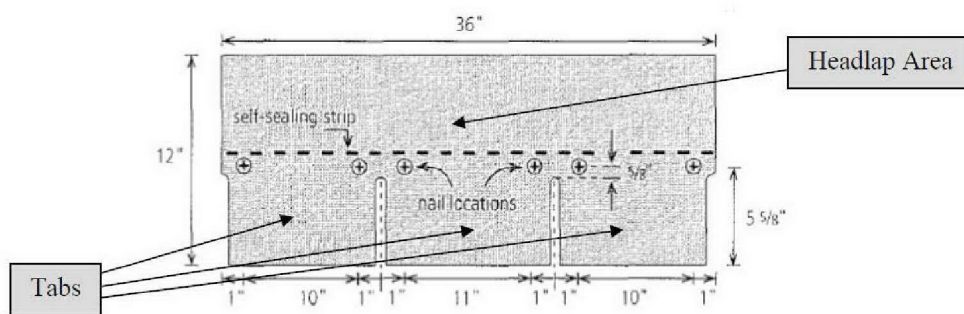
It has heretofore been common practice to manufacture prepared roofing by saturating a suitable absorbant fabric, such as roofing felt, with a liquid bituminous material, e.g., asphalt, coating both sides of the saturated fabric with a bituminous material, surfacing the bituminous coating on one side of the fabric with mineral grit, such as crushed slate, and applying mica, soapstone, or other anti-stick material to the coating on the other side of the fabric.

Id. at 4, col. 1:13–24 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶ 50.

A typical strip shingle includes a plurality of tabs (*i.e.*, flaps) that extend downwardly from a headlap area. Ex. 1003 (Bryson Decl.), at ¶¶ 56-57. Each

asphalt shingle has a nailing zone or fastening zone for attachment to a roof. *Id.*

As shown below in the 1997 edition of the ARMA Residential Roofing Manual (ARMA Manual 1997) (Ex. 1009), at Fig. 10, the nailing zone typically is located just above the tabs in the headlap area. Also shown is the generally longitudinal dimensions of the typical strip shingle, *i.e.*, 36" x 12".



Ex. 1003 (Bryson Decl.), at ¶ 57. As shown, the nailing zone is (a) generally longitudinal like the shingle itself, (b) located between the right and left edges, and (c) generally intermediate of the upper and lower edges. Ex. 1003 (Bryson Decl.), at ¶¶ 57-58.

Claim 1 of the '968 patent provides: “[a]n array of shingles applied to a roof, by fasteners, in courses, each shingle having front and rear exterior surfaces and being comprised of shingle material, with the shingle having a width defined by upper and lower edges and a length defined by right and left edges.” Elements (a)-(d) of claim 1 require the following:

- (a) a base layer of mat having front and rear surfaces;

- (b) a coating of asphaltic material on both front and rear surfaces of the mat;
- (c) coatings of granular material on said both front and rear surfaces of the mat, which, together with said base layer of mat and coatings of asphaltic material comprise a first thickness layer; and
- (d) a longitudinal fastening zone between right and left shingle edges, generally intermediate said upper and lower edges.

Ex. 1038 ('968 patent), at col. 7:30–44. These elements describe nothing more than the basic asphalt shingle, or what was “common practice” since at least the 1930s. Ex. 1003 (Bryson Decl.), at ¶¶ 59-68. The '968 patent acknowledges that the components of the “basic” asphalt shingle were known in the prior art. Ex. 1038 ('968 patent), at col. 2:56-3:13; Ex. 1003 (Bryson Decl.), at ¶¶ 59-68.

To the basic asphalt shingle, elements (e)–(f) of claim 1 of the '968 patent add and describe a “reinforcement second thickness layer”:

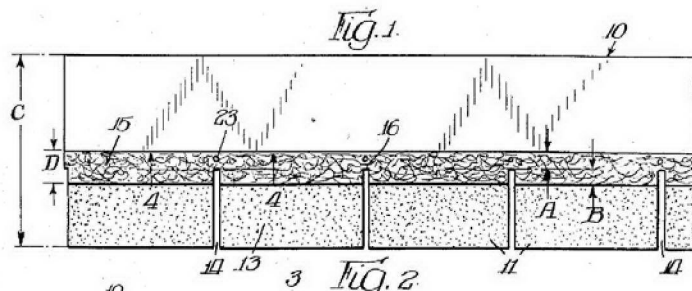
- (e) and an at least partially externally visible generally longitudinal reinforcement second thickness layer of a substantially thinner dimension than said first thickness layer; said reinforcement second thickness layer being adhered to an exterior surface of said shingle and extending at least substantially between right and left edges of the shingle; and
- (f) said reinforcement second thickness layer extending at least partially lower than the fastening zone, toward the lower edge of the shingle or at least partially into the fastening zone toward the upper edge of the shingle.

Ex. 1038 ('968 patent), at col. 7:45–55; *see also id.* col. 3:23-25 (“the shingle 20 is similar to that of the [prior art] shingle 10 of FIG.1, but with a reinforcement layer”). Reinforcement layers having the claimed features were known in the prior art. Ex. 1003 (Bryson Decl.) ¶¶ 69-120.

2. The Prior Art Disclosed a Generally Longitudinal Second Thickness Layer For Reinforcement in the Nailing Zone

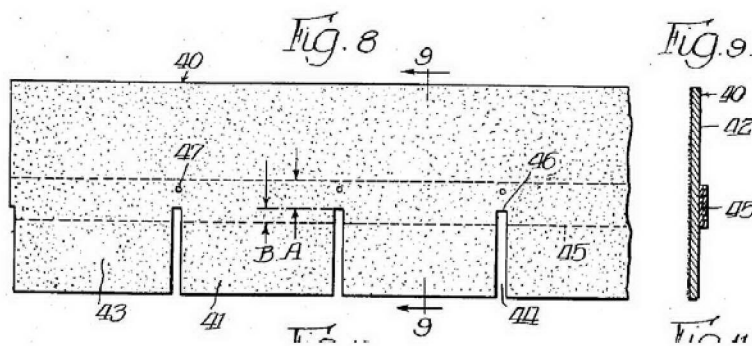
U.S. Patent No. 2,161,440 to Venrick (Venrick 1939) describes a “reinforcing strip” for “strengthening” to “reduce ...tear,” and to “provide a reinforced area for nailing the shingle to the roof.” Ex. 1013 (Venrick 1939), at 3, col. 1:40–46 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 93-97.

The Venrick 1939 strip, which may be made of, *inter alia*, felt, metal, or “layers of roofing tape,” Ex. 1013 (Venrick 1939), at 4, col. 2:74–75, also functions to add “rigidity” to “resist[] the action of the wind.” *Id.* at 5, col. 1:1-9; Ex. 1003 (Bryson Decl.), at ¶ 94. “[I]mproved resistance to failure upon bending” is also a function of the reinforcement layer in the '968 patent. Ex. 1038 ('968 patent), at col. 6:28-29; Ex. 1003 (Bryson Decl.), at ¶ 94. The reinforcing strip is shown in Fig. 1 of Venrick 1939 as 15 on the front surface of a shingle.



Ex. 1003 (Bryson Decl.), at ¶ 95. Venrick 1939 also teaches that the reinforcement strip can be on the “undersurface,” or rear. Ex. 1013 (Venrick 1939), at 4, col. 2:60–63, *see also* Figs. 8–14; Ex. 1003 (Bryson Decl.), at ¶ 96. Also, the strip is preferably “cemented” onto the granule surfacing, Ex. 1013 (Venrick 1939), at 4, col. 1:32–37, and overlaps with the nailing zone to “give greater nailing strength,” Ex. 1013 (Venrick 1939), at 4, col. 2:11–23; Ex. 1003 (Bryson Decl.), at ¶ 96.

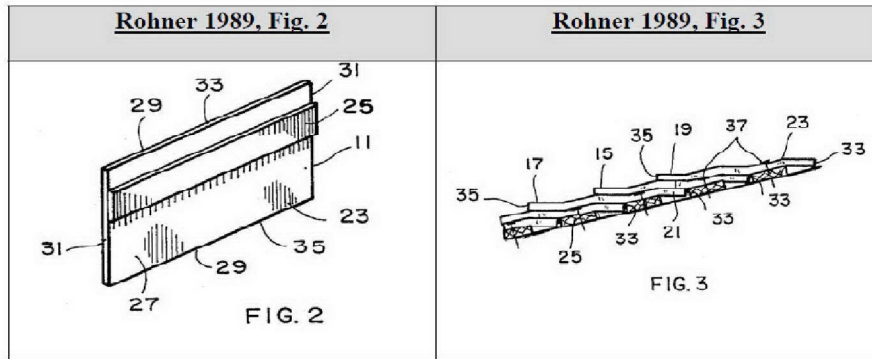
Figs. 8 and 9 of Venrick 1939 show the reinforcement strip 45 as a visible component that is adhered to the exterior rear surface of the shingle. Ex. 1013 (Venrick 1939); Ex. 1003 (Bryson Decl.), at ¶ 97. It extends at least partially into the zone having nailing holes 47, and as shown by the hashed lines, it also extends at least partially lower than the nailing zone (*i.e.*, into the tab portion toward the lower edge of the shingle). *Id.* It also extends toward the upper edge into the headlap area. *Id.* The reinforcement strip clearly forms a second thickness layer. *Id.* The strip is also generally longitudinal as would be expected given that shingles are generally longitudinal. *Id.*



It was known that nailing through multiple layers of shingle material

provided strength and contributed to roofing integrity. Ex. 1003 (Bryson Decl.), at ¶ 98. *E.g.*, U.S. Patent No. 6,145,265 (Ex. 1011), at col. 1:60–62 (“[N]ailing through a double layer of material provides strength, which is essential for roofing integrity in windy conditions.”). Because the nailing zone was generally longitudinal, *see* Ex. 1009 (ARMA Manual 1997), at Fig. 10, it would only make sense to make the reinforcement layer generally longitudinal while extending it at least partially into the nailing zone. Ex. 1003 (Bryson Decl.), at ¶ 98. This is what Venrick 1939 teaches. Ex. 1013 (Venrick 1939), at 5, col. 1:50-54 (“The shingles are nailed preferably... where the raised median strip is.”).

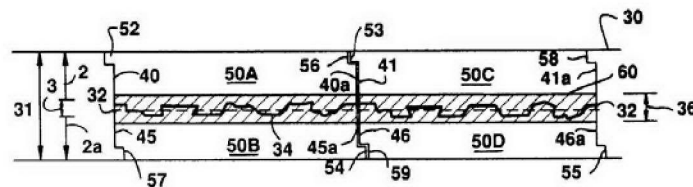
Examples of reinforcing layers affixed to the rear surface abound. U.S. Patent No. 4,875,321 to Rohner (Rohner 1989) (Ex. 1015) discloses a “backing strip” (Fig. 2, 25) that can be made of “light-weight weather-resistant material” to “provide a stiffer shingle which grips the nails....” *Id.* at col. 1:55–59; Ex. 1003 (Bryson Decl.), at ¶ 103. Fig. 2 exemplifies a shingle with a reinforcing backing layer 25. Ex. 1003 (Bryson Decl.), at ¶¶ 103-104. Fig. 3 confirms that the rear facing reinforcing layer 25 extends at least partially into the nailing zone 37. Ex. 1015 (Rohner 1989); Ex. 1003 (Bryson Decl.), at ¶¶ 103-104.



The Rohner 1989 “backing strip” forms a second thickness layer on the rear, and is longitudinal like the shingle itself. Ex. 1003 (Bryson Decl.), at ¶¶ 103-104.

Similarly, U.S. Patent No. 5,860,263 to Sieling (Sieling 1999) (Ex. 1016) shows a “reinforcement” strip 60 affixed to the back portion of an asphalt shingle. Ex. 1003 (Bryson Decl.), at ¶ 105.

FIG.5



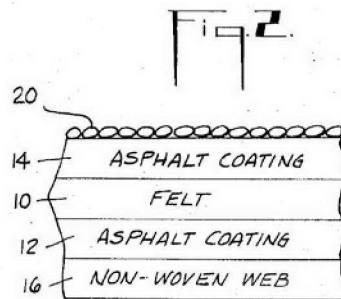
Sieling 1999 describes the reinforcing strip as having dimensions which would have been understood to fall within the nailing zone of the shingle. Ex. 1016 (Sieling 1999), at col. 3:23-28; Ex. 1003 (Bryson Decl.), at ¶ 106. The reinforcing strip in Sieling 1999 is on the exterior surface, forms a second thickness layer, and is longitudinal in orientation. Ex. 1003 (Bryson Decl.), at ¶ 106.

3. The Prior Art Taught Thin Reinforcement Material

As Venrick 1939, Rohner 1989, and Sieling 1999 show, the concept of using

a reinforcing layer on the back of a shingle was not new. Ex. 1003 (Bryson Decl.), at ¶¶ 69-120. Nor was the concept of using thin material for reinforcement. *Id.*

U.S. Patent No. 3,813,280 to Olszyk (Olszyk 1974) (Ex. 1014) issued in 1974 and shows a web layer 16 affixed to the back of an asphalt shingle. Ex. 1003 (Bryson Decl.), at ¶ 99.



A purpose of the web layer is “adding reinforcement ... and providing additional tear strength.” Ex. 1014 (Olszyk 1974), at col. 4:17–27 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶ 100. The thickness of the web is on the order of 1/1000th of an inch. Ex. 1014 (Olszyk 1974), at col. 3:59-60 (“a thickness of between 10 mils or less to about 30 mils.”); Ex. 1003 (Bryson Decl.), at ¶ 101.

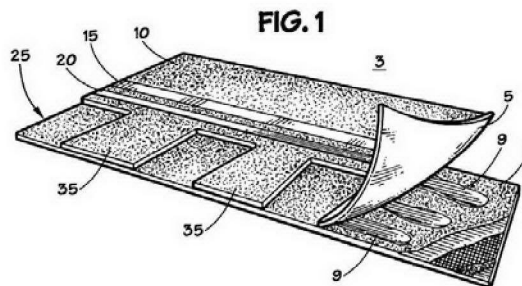
U.S. Patent Publ. No. 2001/0055680 to Kiik (Kiik 2001) (Ex. 1018) discloses an asphalt roof shingle having a “backing material” that can be made of woven polyester and latex fiber bound by latex. *Id.* at [0004], [0006]; Ex. 1003 (Bryson Decl.), at ¶ 110. The exemplary materials have a thickness of 13-23 1/1000th of an inch. Ex. 1018 (Kiik 2001), at [Table 1]; Ex. 1003 (Bryson Decl.), at ¶ 110. Data in Kiik 2001 show that the reinforced laminated shingles exhibited

improved tear strength and nail pull strength. Ex. 1018 (Kiik 2001), at Table 1 and 2; Ex. 1003 (Bryson Decl.), at ¶ 113. Thus, like Venrick 1939 and Olszyk 1974, Kiik 2001 showed that thin material could be affixed to the back of an asphalt shingle to provide reinforcing properties. Ex. 1003 (Bryson Decl.), at ¶ 113.

4. Laminated Shingles Including Multiple Reinforcement Layers Were Known

U.S. Patent No. 5,822,943 to Frankoski (Frankoski 1998) (Ex. 1010) issued in 1998. Ex. 1003 (Bryson Decl.), at ¶ 71. The '968 patent incorporates by reference Frankoski 1998 and says that the "basic" asphalt shingle can be made according to its teachings. Ex. 1038 ('968 patent), at col. 3:10-13.

Frankoski 1998 (Ex. 1010) discloses a laminated shingle, which is exemplified by Figures 1 and 2 of the reference. Ex. 1003 (Bryson Decl.), at ¶ 71. A laminated shingle is simply a shingle made of two layers that are glued together. *Id.* This is shown in Figure 1 of Frankoski 1998 (Ex. 1010).

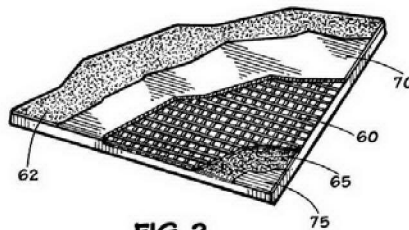


The shingle comprises an upper layer 5 and a lower layer 7, which are glued together with a sealant 9. Ex. 1003 (Bryson Decl.), at ¶ 72. The upper layer has a headlap area 10 and a number of tabs (shown as 35). *Id.* The lower layer is

generally longitudinal, and extends between the right and left edges. *Id.*

It was widely known that gluing an extra shingle layer to the back surface of what was essentially a single layer strip shingle, as in a laminated shingle, provided reinforcement properties by enabling a roofer to nail through two, rather than one, layer of material. *Id.* at ¶ 76. U.S. Patent No. 6,145,265 (Malarkey 2000) (Ex. 1011) explains this common-sense principle by noting that “nailing through a double layer of material provides strength.” *Id.* at col. 1:54-62 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶ 76. Laminated shingles, which by the late 1990s and early 2000s were among the most popular shingles made and sold, therefore utilized a second thickness layer of material that was recognized to add reinforcement. Ex. 1003 (Bryson Decl.), at ¶ 76.

Fig. 2 of Frankoski 1998 (Ex. 1010) also shows a scrim layer 60 in the laminated shingle. Ex. 1003 (Bryson Decl.), at ¶¶ 77-78.



Scrim is thin material that can be made from any number of different fabrics, synthetic, or composite materials. *Id.* The scrim layer “provides a superior strength and nail pull-through resistance to withstand, for example, hurricane force

winds.” Ex. 1010 (Frankoski 1998), at col. 3:20–24; Ex. 1003 (Bryson Decl.), at ¶ 78. Frankoski 1998 (Ex. 1010) states that the reinforcing scrim preferably extends the entire length of the shingle. *Id.* at col. 5:27–28. This would be understood to mean the reinforcing scrim is generally longitudinal given that most shingles were longer than they were wide. Ex. 1003 (Bryson Decl.), at ¶¶ 78-81. Frankoski 1998 also states that the scrim should “coincide with at least a portion of the nail zone.” Ex. 1010 (Frankoski 1998), at col. 5:38-39; Ex. 1003 (Bryson Decl.), at ¶ 81.

As discussed *infra* at § III.C.2., Patent Owner distinguished the alleged invention over Frankoski 1998 by arguing that the reinforcing layer of the alleged invention is not “embedded” within the shingle as the scrim 60 is in Frankoski 1998, and that it instead is affixed to the exterior, rear surface of the shingle. At the time these arguments were made, neither Venrick 1939, Rohner 1989 nor Sieling 1999 (each discussed above) were before the Patent Office. *See generally*, Ex. 1003 (Bryson Decl.), at §§ III.F.-III.H.

B. General Overview Of The '968 Patent

The '968 patent issued on Decemer 31, 2013, to Kalkanoglu and Koch. The title is “Shingle With Reinforcement Layer.” Ex. 1038 ('968 patent), at col. 1:1.

1. The '968 Patent Recognizes the Basic Asphalt Shingle Was Known

The '968 patent acknowledges that the basic components of an asphalt shingle were known in the prior art. Ex. 1038 ('968 patent), at col. 2:56-3:13.

Referring to Fig. 1, the '968 patent describes the “prior art shingle” as being made of a mat covered with asphalt on “each exposed surface” with “granular material” on the upper exposed surface to withstand weather and “smaller granules” on the “undersurface.” *Id.* at col. 2:56-66. The '968 patent states that the “basic” prior art shingle can be made by the methods disclosed in, among other references, Frankoski 1998. *Id.* at col. 3:10-11; Ex. 1003 (Bryson Decl.), at ¶ 70.

2. Only a Rear Exterior Surface Reinforcement Layer Is Disclosed in the '968 Patent

The person of ordinary skill would understand that the reinforcement layer disclosed in the '968 patent is affixed to the rear surface of the asphalt shingle, and nowhere else. Ex. 1003 (Bryson Decl.), at ¶ 223.

The specification states: the “present invention is directed toward providing a shingle, wherein a separate, *exterior reinforcement layer* is provided *outside the rear surface of the shingle...*” Ex. 1038 ('968 patent), at col. 1:53-57 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 137, 208, 223.

The figures provided in the '968 patent show the reinforcement layer to be located on the rear surface of the shingle. Ex. 1003 (Bryson Decl.), at ¶¶ 138-143, 208, 223. Fig. 2 shows a prior art shingle with “reinforcement layer applied to the rear surface thereof, in accordance with the present invention.” Ex. 1068, at col. 2:19-21 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 139, 208, 223. Fig. 3 also shows the “rear surface.” Ex. 1003 (Bryson Decl.), at ¶¶ 141, 208, 223.

The specification consistently emphasizes that the reinforcement layer is located on the “rear surface.” *See, e.g.*, Ex. 1038, at Figs. 4 and 4A (reinforcement layer 29 on rear surface of shingle); col. 1:54-55 (“reinforcement layer is provided ***outside the rear surface***”); col. 3:24-27 (“a reinforcement layer . . . ***added on the rear*** 21 of the shingle”); col. 4:18-19 (“the scrim ***46 applied to the undersurface***”); col. 6:24-7:24 (extolling performance of “scrim reinforcement embedded ***on their rear sides***,” a “polyester mat reinforcement layer ***on their rear surfaces***,” a heavier “reinforcement layer ***on the rear surface***,” “fiber-glass scrim ***on the rear surface***,” and “reinforcement material that is ***applied to the rear***”) (emphasis added). Ex. 1003 (Bryson Decl.), at ¶¶ 143, 208, 223. Not once is there any indication that the reinforcement layer can be placed elsewhere. *Id.*

Moreover, the specification describes only one method for making the described shingle, and this method places the reinforcement layer on the rear. Ex. 1038 (’968 patent), at col. 4:1-9; Ex. 1003 (Bryson Decl.), at ¶¶ 144, 208, 223. Placement on the rear is also described to be critical to performance. Ex. 1003 (Bryson Decl.), at ¶¶ 145, 208, 223. Figure 4 of the ’968 patent illustrates that “the scrim 46 ***applied to the undersurface of the shingle*** 41 will tend to resist upward bending of the shingle tab portion 44, largely because of the resistance to such bending that is provided by the reinforcement layer 29, 39 as shown in FIGS. 2 and 3 which will resist stretching and thereby inhibit bending.” Ex. 1038 (’968 patent),

at col. 4:15-23 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 145-47, 208, 223.

3. The Reinforcement Layer Is “Adhered” to the Surface in All the Claims

The specification draws a distinction between a reinforcement layer that is “adhered” to the shingle and one that is “embedded”: “the reinforcement layers” are “either embedded in the asphaltic layer on the rear of the shingle or adhered to the rear of the shingle...” Ex. 1038 (’968 patent), at col. 4:1-4 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 149-151, 208, 223.

The claims of the ’968 patent all require a reinforcement layer that is “adhered” to the shingle. *Id.* at col. 7:30-10:25. As explained *infra* at § III.C.2., during prosecution of related applications, Patent Owner distinguished Frankoski 1998 on the basis that it disclosed an “embedded” reinforcement layer, as opposed to one applied to an external, rear surface of the shingle. *See infra*, at § III.C.2.

4. The Reinforcing Layer Provides Strength and Stability

The function of the reinforcement layer described in the ’968 patent is to provide additional strength and stability to the shingle. Ex. 1003 (Bryson Decl.), at ¶¶ 154-160, 208, 223. As discussed, the purpose of the alleged invention is to, among other things, provide “improved resistance to damage due to wind uplift.” Ex. 1038 (’968 patent), at col. 6:32-34. Another purpose of the reinforcement layer is to “resist tearing.” *Id.* at col. 4:40-50. Results from “bending tests” and “[n]ail pull tests” are presented to illustrate the qualities of shingles made

according to the claimed invention. *Id.* at col. 5:33-7:9.

C. Prosecution History and Effective Filing Date of the '968 Patent

1. Prosecution of the '968 Patent

The '968 patent issued on December 31, 2013, from U.S. Application No. 13/855,820, which was filed on April 3, 2013. Ex. 1038 (the '968 patent), at 1. No prior art rejections were made. Venrick 1939 was not before the Patent Office during prosecution of the '968 application. Ex. 1003 (Bryson Decl.), at ¶¶ 285-289.

2. Prosecution of Related Patent Applications

The '820 application that resulted in the issuance of the '926 patent is related, by continuation, to a number of other applications filed before the issuance of the '968 patent. Frankoski 1998 played a prominent role during the prosecution of several of these applications. Patent Owner sought to supplement the specification by incorporating Fig. 1 of Frankoski 1998 into the disclosure, claiming that the new figure reflected the “preferred” embodiment of the alleged invention. But when the claims were rejected in view of Frankoski 1998, Patent Owner went to great lengths to distinguish the alleged invention from the Frankoski 1998 reference. Patent Owner’s actions shed important light on the nature and scope of the alleged invention.

a. U.S. Appl. No. 10/871,911

U.S. Application No. 10/871,911 was filed on June 18, 2004 and issued on

October 10, 2006, as U.S. Patent No. 7,118,794. Ex. 1027 ('794 patent), at 1; Ex. 1003 (Bryson Decl.), at ¶ 234.

All the pending claims were rejected in an Office Action dated June 1, 2005. Ex. 1024 ('911 Appl. File Wrapper), at 52. Among other things, the claims were rejected as being anticipated by, or obvious in view of, Frankoski 1998. In response to the rejection, the Patent Owner amended claim 1 to require that the claimed wind resistant layer be on the “rear surface of said shingle,” and argued that Frankoski 1998 did not anticipate or render obvious the claims: “Frankoski does not disclose a scrim on an outer surface of the shingle,” whereas “the scrim of the instant invention is on the rear surface of the shingle, having a front surface thereof adhered to the asphaltic material on the rear surface of the shingle, and the rear surface of the scrim being uncoated, to resist upward lift via wind.” *Id.* at 67-71 (emphasis added). The Patent Owner stated: “The invention of Frankoski is directed to how one makes a substrate; it has nothing to do with applying a layer of scrim on to the rear surface of a shingle to resist wind lift-up.” *Id.* at 72.

The Examiner was apparently persuaded by the Patent Owner’s arguments. The rejections based on Frankoski 1998 were withdrawn, and the application subsequently allowed to issue. *See id.* at 119.

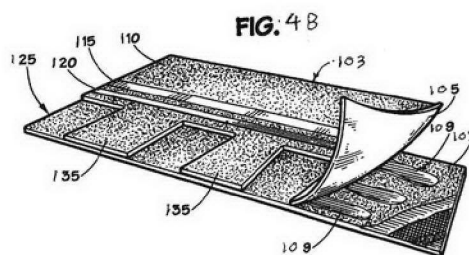
b. U.S. Appl. No. 12/857,868

U.S. Appl. No. 12/857,868, filed on August 17, 2010 claims to be a

continuation of the '506 application. Ex. 1037 ('243 patent), at 1. It issued on May 8, 2012, as U.S. Patent No. 8,173,243. *Id.*; Ex. 1003 (Bryson Decl.), at ¶¶ 244-245. As filed, the abstract read as follows:

A laminated shingle and a method of making it is provided in which ***the rear surface of the shingle*** is provided with an attached reinforcement layer through which fasteners may be applied when the shingle is applied to a roof. Ex. 1029 ('868 Appl. File Wrapper), at 23. (emphasis added).

In a preliminary amendment, new Fig. 4B was added. *Id.* at 52. The stated purpose: to “incorporate subject matter ... incorporated by reference in the specification.” *Id.* at 50. New Fig. 4B was presented as a photocopy of Fig. 1 from Frankoski 1998, with hand-written annotations increasing the item numbers by 100. Ex. 1003 (Bryson Decl.), at ¶¶ 247-248:



A new description corresponding to Fig. 4B was also added to the specification. Ex. 1034 ('243 patent), at col. 4:40–49; *see* Ex. 1029 ('868 Appl. File Wrapper), at 50-51. This passage is identical to the passage in Frankoski 1998 except for the re-numbering of the items and the introduction of a typographical

error. Ex. 1003 (Bryson Decl.), at ¶ 252.

In the amended excerpt, Patent Owner stated that Fig. 4B showed “[t]he **preferred laminated roofing shingle**” “**in accordance with the present invention.**” Ex. 1029 (’868 Appl. File Wrapper), at 51; Ex. 1037 (’243 patent), at col. 4:40–41 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶ 253. This material is the only description of a laminated shingle contained in the specification.

In an office action dated October 15, 2010, all the pending claims were rejected in view of Frankoski 1998. Ex. 1029 (’868 Appl. File Wrapper), at 57. In the rejection, the Examiner indicated that the scrim 60 in Frankoski 1998 satisfied the “reinforcement second thickness layer” limitation required by the claims. *Id.* at 60-62; Ex. 1003 (Bryson Decl.), at ¶ 255.

In response, the Patent Owner argued that the claimed reinforcement layer is located “on ‘said **rear surface** of said posterior layer of said shingle,’” whereas the reinforcement layer of Frankoski 1998 is shown “as being above the mat layer.” Ex. 1029 (’868 Appl. File Wrapper), at 84 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 256-257.

Patent Owner also argued that, unlike the alleged invention, the reinforcement layer of Frankoski 1998 is embedded in the shingle: “While in Frankoski et al, the scrim may be either above or below the mat, **it is nevertheless embedded in the shingle layer.**” Ex. 1029 (’868 Appl. File Wrapper), at 84

(emphasis added); Ex. 1003 (Bryson Decl.), at ¶ 258.

The Patent Owner also argued that the position of the reinforcement layer on the rear surface of the shingle was critical: “the scrim appears ***on the rear*** of the posterior layer of the shingle and ***it is because of this*** that such provides the favorable force bending characteristics for the shingle shown in Fig.4, that resist upward lifting due to wind conditions. This is different than applying a scrim inwardly of the shingle...” Ex. 1029 (’868 Appl. File Wrapper), at 84-85; Ex. 1003 (Bryson Decl.), at ¶ 259 (emphasis added).

When these arguments proved unsuccessful, Patent Owner appealed the rejections. *Id.* at 117. In the summary of the subject matter in the appeal brief, the Patent Owner stated: “A reinforcement layer is ***on the rear surface*** of the shingle.” *Id.* at 125-26 (emphasis added). Ultimately, without any decision on the appeal, the Examiner allowed the claims and the application issued as the ’243 patent. *Id.* at 180; Ex. 1003 (Bryson Decl.), at ¶¶ 266-267.

3. Effective Filing Date of the Claims

For the purposes of this proceeding, Petitioner will assume that the effective filing date of claims 1–18 of the ’968 patent is not earlier than November 6, 2002, the earliest filing date of any application to which the ’968 patent claims priority. Ex. 1003 (Bryson Decl.), at ¶ 45.

D. Person of Ordinary Skill in the Art

The person of ordinary skill has a bachelor's degree, and potentially some advanced schooling, in chemistry, engineering (such as chemical, civil, or mechanical engineering), materials science, physical science, or a related discipline, and approximately 3–5 years of additional training and experience in the field of roofing materials and asphalt shingles. Ex. 1003 (Bryson Decl.), at ¶ 44.

E. Construction of Terms Used in the Claims

In an IPR, claims must be given their broadest reasonable construction in light of the specification. 37 CFR 42.100(b); M.P.E.P. § 2111.01.

1. Elements (a)-(d) of Claim 1

As discussed *supra* at § III.A.1., the preamble and elements (a)-(d) of claim 1 describe nothing more than the “basic” prior art asphalt shingle, made by methods considered “common practice” since at least the 1930s. And as discussed, *supra* at § III.A.1., the '968 patent itself acknowledges that basic asphalt shingle was known. Ex. 1038 ('968 patent), at col. 2:56-3:9; Ex. 1003 (Bryson Decl.), at ¶¶ 59-68. The preamble and elements (a)-(d) therefore encompass nothing more than an asphalt shingle made of (i) a base layer of mat having front and rear surfaces, (ii) a coating of asphaltic material on both front and rear surfaces of the mat, and (iii) a coating of granular material on the asphaltic material on both front and rear surfaces, which combined together form a “first thickness layer.” Ex.

1003 (Bryson Decl.), at ¶ 337.

2. “said shingle”

Claim 1 uses the term “shingle” several times. “Shingle” is used, for example, in the preamble to describe the claimed product as a whole. “Shingle” also appears twice in element (e), describing the location where the “reinforcement second thickness layer” is “adhered.” Ex. 1038 (’968 patent), at col. 7:45-51; Ex. 1003 (Bryson Decl.), at ¶¶ 294, 338.

The use of the term “shingle” to describe both (1) the claimed product as a whole and (2) the location where a component of the claimed product is “adhered” is internally inconsistent and raises questions as to claim scope. Ex. 1003 (Bryson Decl.), at ¶¶ 295, 338. For example, if the “reinforcement second thickness layer” is one component of the claimed “shingle,” while at the same time being adhered to the same “said shingle,” then one possibility, based on the literal reading of the claim, is that the “reinforcement second thickness layer” is adhered to itself. *Id.* But this obviously makes no sense. *Id.*

This logical inconsistency is resolved only if, for the purposes of this proceeding, different meanings are assigned to the term “shingle” depending on the context. In the preamble, the term “shingle” clearly refers to the claimed product as a whole, which includes a “reinforcement second thickness layer.” *Id.* at ¶¶ 297, 338. But in the limitation describing the attachment of the reinforcement layer in

element (e), the “said hinge” cannot already include a “reinforcement second thickness layer” because element (e) states that the “reinforcement second thickness layer” is “adhered to an exterior surface of said shingle.” *Id.* at ¶¶ 298, 338.

To make any sense of this otherwise illogical claim, the “shingle” in element (e) should be interpreted to mean the “first thickness layer” identified in element (c). Claim 1 requires a distinct “first thickness layer” and a distinct “reinforcement second thickness layer.” *Id.* at ¶¶ 299, 338. The “first thickness layer” comprises “a base layer of mat,” “a coating of asphaltic material on both front and rear surfaces of the mat,” and “coatings of granular material on said both front and rear surfaces.” *Id.* at ¶¶ 300, 338. Because of the requirement for distinct first and second thickness layers, the only location to which the “reinforcement second thickness layer” may be adhered is the outside exterior surface (*i.e.*, “coatings of granular material”) of the first thickness layer. *Id.* at ¶¶ 300, 338.

Adhering the “reinforcement second thickness layer” to any other recited claim element (*e.g.*, the “base layer of mat”) would amount to inserting the “reinforcement second thickness layer” within the “first thickness layer” thereby violating the claim requirement for distinct first and second thickness layers. *Id.* at ¶¶ 300, 338. Further, as explained *supra* at § III.C.2., during prosecution of related applications, Patent Owner repeatedly emphasized that the reinforcement layer of

the alleged invention was not “embedded” within the shingle, and instead positioned on the outside surface of the shingle. The requirement that the “reinforcement second thickness layer” be adhered to the “exterior surface” is consistent with this understanding because the person of ordinary skill would understand that there is only one “exterior surface” described in the claim, *i.e.*, the granular surface of the “first thickness layer.” Ex. 1003 (Bryson Decl.), at ¶ 300. The requirement that the reinforcement layer be adhered to the “exterior surface” is consistent with this understanding because only one “exterior surface” described in the claim, *i.e.*, the granular surface of the “first thickness layer.”

This understanding is also supported by the specification itself, which states that, when the reinforcing layer is “adhered,” this is done by means of “an additional post-applied thin layer of asphaltic or non-asphaltic adhesive.” Ex. 1038 (’968 patent), col. 4:5-6; Ex. 1003 (Bryson Decl.), at ¶¶ 300, 338. “Post-applied” would be understood to refer to a manufacturing step downstream of the steps in which asphalt and granular material are applied to the mat. Ex. 1003 (Bryson Decl.), at ¶¶ 301, 338. Figs. 2A, 4 and 4A are in accord as each shows the reinforcement layer as a distinct thickness layer. *Id.*

Thus, the meaning of the phrase “said shingle” to refer to the location where the “reinforcement second thickness layer” is “adhered” must be “first thickness layer,” such that the requirement for the “reinforcement second thickness layer” to

be “adhered to an exterior surface of said shingle” means that it must be adhered to the exterior surface of the first thickness layer, as discussed further below. *Id.* at ¶¶ 301-302, 338.

This construction is necessary to preserve the claim’s requirement for distinct first and second thickness layers notwithstanding the usage of the term “shingle” in the preamble to mean the finished product as a whole and would apply not only to the use term “said shingle” in element (e) of claim 1, but also any where else where a description is being made of where or how the “second reinforcement thickness layer” is “adhered.” *Id.*

3. “adhered to an exterior surface of said shingle”

Claim 1 requires that the “reinforcement second thickness layer” be “adhered to an exterior surface of said shingle.” The specification of the ’968 patent describes how the “reinforcement second thickness layer” is attached. Specifically, the patent states that the reinforcement layer is:

either embedded in the asphaltic layer on the rear of the shingle or adhered to the rear of the shingle by an additional post-applied thin layer of asphaltic or non-asphaltic adhesive. The reinforcement layer 29, 39, will be adhered to the rear surface 21, 31 of the shingles of this invention, by means of any suitable adhesive, such as a bitumen or the like, or any other adhesive.

Ex. 1038 (’968 patent), at col. 4:3-9 (emphasis added).

A clear distinction is being drawn between an “embedded” reinforcement

second layer and one that is “adhered.” Ex. 1003 (Bryson Decl.), at ¶¶ 305, 338.

In fact, as discussed *supra* at § III.C.2., the inventors distinguished Frankoski 1998 on the basis that it disclosed an “embedded” reinforcement layer whereas the claimed invention did not. *Supra*, at § III.C.2.

In general, the term “embedded” means that something is fixed into a surrounding mass, usually by mechanical or physical means. *See, e.g.*, Ex. 1039 American Heritage Dictionary, 4th Ed. (2000) (American Heritage 2000), at 4 (defining “embed” as “[t]o fix firmly in a surrounding mass”); Ex. 1003 (Bryson Decl.), at ¶¶ 306, 338. In the asphalt roofing industry, embedded material is material that is mechanically affixed into surrounding material, such asphalt. Ex. 1003 (Bryson Decl.), at ¶¶ 306, 338. In other words, physical contact and overlap between the materials results in attachment. *Id.*

“Adhered” generally means stuck together as if by glue or cement. *See, e.g.*, Ex. 1039 (American Heritage 2000), at 3 (defining “adhere” as “[t]o stick fast by or as if by suction or glue”); Ex. 1003 (Bryson Decl.), at ¶¶ 307, 338. Unlike “embedded” material, when materials are said to be “adhered,” attachment generally occurs via chemical interactions between the two materials, or between each of the materials and a separate adhesive, particularly in a context, such as in the ’968 patent, where a clear distinction is being drawn between “adhered” and “embedded.” Ex. 1003 (Bryson Decl.), at ¶¶ 307, 338.

While no examples of “embedded” material are described in the patent, the patent does describe how the reinforcing layer is “adhered” to the shingle. Ex. 1003 (Bryson Decl.), at ¶¶ 308, 338. Specifically, the ’968 patent states that the reinforcement layer is adhered by an “additional” thin layer of asphalt or non-asphaltic adhesive. Ex. 1038 (’968 patent), at col. 4:5-6. In other words, additional material is used as an adhesive. Ex. 1003 (Bryson Decl.), at ¶¶ 308, 338. The specification states that the adhesive is “post-applied” meaning that it is applied at some point after shingle has been made, *i.e.*, after the mat has been coated with asphalt and covered with granular material. *Id.* at ¶¶ 309, 338.

Further, the person of ordinary skill would understand that the “reinforcement second thickness layer” is “adhered” to the rear surface of the “shingle,” *i.e.*, the “first thickness layer.” Ex. 1003 (Bryson Decl.), at ¶¶ 310, 338. As discussed above, the clear focus of the invention is a reinforcing layer that is attached to the rear surface. *Supra*, at § III.B. Not only does the specification describe the location of the reinforcement layer in the “present invention” as being on the rear surface, but the specification states that this location is critical to performance. *Id.* The prosecution history confirms that the reinforcement layer must be on the rear surface. *Supra*, at § III.C.

Thus, the broadest reasonable construction of “adhered to an exterior surface of said shingle” is “attached to the rear exterior surface of the first thickness layer

by means of glue, cement, or some other chemical interaction between one or more materials.”

4. “reinforcement . . . layer”

The broadest reasonable construction of “reinforcement second thickness layer” is a layer of material that provides the shingle with support or strength so as to, for example, resist bending under wind conditions, resist tearing, or resist nail pull. Ex. 1003 (Bryson Decl.), at ¶¶ 312, 338.

5. “substantially thinner”

The term “substantially thinner” is used to describe the “reinforcement second thickness layer,” but is not defined in the patent and does not carry with it a generally understood meaning in the field. Ex. 1003 (Bryson Decl.), at ¶¶ 313, 338. Therefore, this term fails to “inform those skilled in the art about the scope of the invention with reasonable certainty.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129-30 (2014).

While the specification and claim 6 of the ’968 patent state that the “reinforcement second thickness layer” may be made of “a scrim” or of “woven or nonwoven thin fabric, plastic film, paper, parchment, foil or the like,” Ex. 1038 (’968 patent), at col. 4:1-3, these materials can vary in thickness. Ex. 1003 (Bryson Decl.), at ¶¶ 314-315, 338. These examples shed no light on what “substantially thinner” means. *Id.*

The figures in the '968 patent confuse things further. *Id.* at ¶¶ 316, 338. For example, Fig. 4A shows that the reinforcement material 46 has a thickness that is substantial enough to cause a hump in the shingle when attached to a roof 40. *Id.* Fig. 2A shows the reinforcing layer 29 is nearly as thick as the main part of the shingle. *Id.*

For the purpose of this proceeding, however, Petitioners will ignore this ambiguity and assume that any material made from woven or nonwoven thin fabric, plastic film, paper, parchment, foil, scrim, “or the like,” which the person of ordinary skill would understand could be fabricated to have a thickness smaller than a base shingle mat, meets the “substantially thinner” limitation of the claims. Ex. 1003 (Bryson Decl.), at ¶¶ 317, 338.

IV. Precise Reasons for Relief Requested

A. Claims 1–18 Are Unpatentable Over Venrick 1939 (Ex. 1013)

U.S. Patent No. 2,161,440 to Venrick (Venrick 1939) (Ex. 1013) issued on June 6, 1939 and is prior art under 35 U.S.C. § 102(b).

1. Venrick 1939 Anticipates Claim 1 Of The '968 Patent

The preamble of claim 1 and elements (a)–(d) of claim 1 describe nothing more than the basic asphalt shingle, installed on a roof in the conventional manner. Venrick 1939 discloses the basic asphalt shingle, installed on a roof in the conventional manner. Ex. 1003 (Bryson Decl.), at ¶¶ 95, 340–344, 837–843; Ex.

1013 (Venrick 1939).

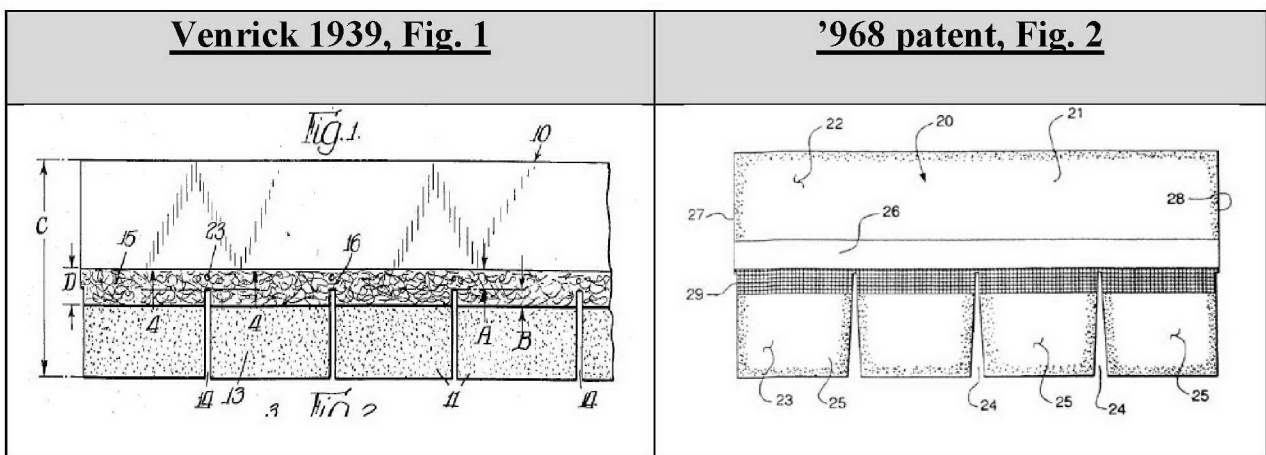
Venrick 1939 discloses a “fabricated shingle strip consisting of a base of fibrous material to which asphalt or similar plastic material is applied and which is surfaced with comminuted or granular material.” Ex. 1013 (Venrick 1939), at 3, col. 1:1–7. The base mat in Venrick 1939 would have been understood to have a front exterior surface and a rear exterior surface, a width defined by upper and lower edges, and a length defined by right and left edges. Ex. 1003 (Bryson Decl.), at ¶¶ 340–341, 839–840. The disclosed shingle would also be understood to be coated with asphalt on both sides and surfaced with granular material on both sides, which was “common practice” since the 1930s. Ex. 1013 (Venrick 1939), at 3, col. 2:47–51; Ex. 1008 (Miller 1937), at 4, col. 1:13–24; Ex. 1003 (Bryson Decl.), at ¶¶ 50, 342–343, 841–842. The disclosed shingle is obviously “comprised of shingle material.” *Id.* at ¶ 839.

Venrick 1939 also discloses an array of shingles applied to a roof, by fasteners, in courses. Figs. 2 and 3 illustrate “the manner of laying the present shingles in overlapping relation on a roof.” Ex. 1013 (Venrick 1939), at 3, col. 2:9–13. These depict an array of shingles applied to a roof in courses. Ex. 1003 (Bryson Decl.), at ¶¶ 95, 838. Venrick 1939 also discloses the obvious: the use of fasteners — nails — to apply the shingles to the roof. Ex. 1013 (Venrick 1939), at 4, col. 2:6–10; *see id.* at 4, col. 2:12, Figs. 1, 3; Ex. 1003 (Bryson Decl.), at ¶ 838.

The asphalt shingle in Venrick 1939 (Ex. 1013) is shown to have a nailing zone that includes a number of “nail openings” 23 in Fig. 1 that extend longitudinally between the right and left edges and are located between or intermediate the upper and lower edges. Ex. 1003 (Bryson Decl.), at ¶¶ 344, 843. The nailing zone is also shown by the “nail openings” 47 in Fig. 8. *Id.*

Venrick 1939 (Ex. 1013) also discloses elements (e)-(f), *i.e.*, the “reinforcement second thickness layer.” Specifically, Venrick 1939 discloses a “reinforcing strip” for, among other things, “strengthening,” to “reduce...tear” and to “provide a reinforced area for nailing the shingle to the roof.” Ex. 1013 (Venrick 1939), at 3, col. 1:40–46; Ex. 1003 (Bryson Decl.), at ¶¶ 93–97, 844–845.

Fig. 1 of Venrick 1939 shows the reinforcing strip on the front of the shingle. Its overall location is nearly identical to the location of the reinforcement layer disclosed in the '968 patent at, for example, Fig. 2, except that, in the '968 patent, the strip is on the rear. Ex. 1003 (Bryson Decl.), at ¶ 348.



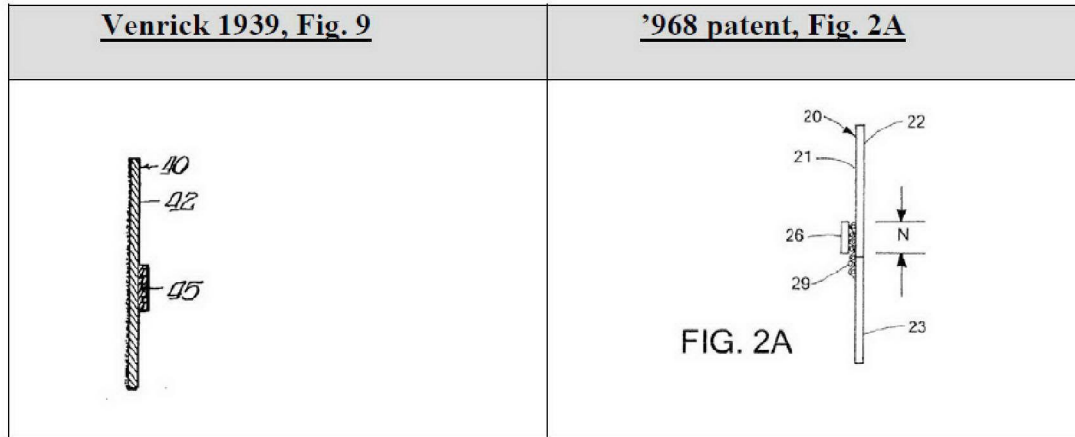
The reinforcing strip in Venrick 1939 (Ex. 1013) can be on the rear exterior

surface of the shingle. *See id.* at Figs. 8–12; Ex. 1003 (Bryson Decl.), at ¶ 349.

Venrick 1939 (Ex. 1013) states: “in Figures 8, 10, and 12 the raised median strip is located on the undersurface of the shingle.” *Id.* at 4, col. 2:60–62 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶ 349.

As shown in Figs. 8–12 of Venrick 1939 (Ex. 1013), the reinforcing strip forms a partially externally visible second thickness layer that is generally longitudinal in orientation like the shingle itself and extends between the right and left edges of the shingle. *See also id.* at 5, col. 1:26–27 (“said strip extends longitudinally of the shingle and accordingly reinforces and strengthens the same.”); Ex. 1003 (Bryson Decl.), at ¶ 350.

According to Venrick 1939 (Ex. 1013), the reinforcing strip can be made of “felt, or metal, or...roofing tape suitably bonded together.” *Id.* at 4, col. 2:73-5, col. 1:1. The described felt and metal would be understood to have a thickness that is thinner than the thickness of the asphalt and granule covered mat. Ex. 1003 (Bryson Decl.), at ¶¶ 353–354. Roofing tape has a thickness that is generally much thinner than the thickness of the asphalt and granule covered mat. *Id.* at ¶ 355. Notably, Fig. 9 of Venrick 1939 (Ex. 1013) shows the reinforcement strip 45 to have thickness on the same order as the reinforcement layer 29 shown in Fig. 2A of the '968 patent. Ex. 1003 (Bryson Decl.), at ¶ 356.



Venrick 1939 (Ex. 1013) also specifically contemplates that the reinforcing strip is applied to an exterior surface of the shingle after the manufacture of the shingle using an adhesive such as cement. *Id.* at 4, col. 1:34–37 (“it is preferable to apply the strip 15 to the shingle after manufacture and thus said strip will be suitably cemented to the granule surfacing 13.”) (emphasis added). Indeed, attachment in a “post-applied” fashion is preferred. *Id.* Venrick 1939 therefore shows that the reinforcing strip is a “second” thickness layer that is adhered to the first thickness layer, *i.e.*, the layer made of the base mat and asphalt/granule coatings. Ex. 1003 (Bryson Decl.), at ¶¶ 152, 314–317, 358–350, 354–356, 844.

Venrick 1939 also shows that the reinforcing strip extends (a) at least partially lower than the nailing area, toward the lower edge of the shingle and (b) at least partially into the fastening zone towards the upper edge of the shingle. Ex. 1003 (Bryson Decl.), at ¶¶ 351–352, 845. Figs. 8 and 9 of Venrick 1938 (Ex. 1013), for example, show that the reinforcing strip is on the back of the shingle and

that the width of the strip extends at least partially into the area where the “nail openings” 47 are located. Venrick 1939 explicitly states that the “shingles are nailed preferably ... where the raised median strip is [located]. . .” *Id.* at 5, col. 1:51–56; Ex. 1003 (Bryson Decl.), at ¶ 351. As shown by the hashed lines, the figures also show that the strip extends into the tab area (*i.e.*, towards the lower end of the shingle) and into the headlap area (*i.e.*, towards the upper edge of the shingle. Ex. 1003 (Bryson Decl.), at ¶ 351–352. Venrick therefore anticipates claim 1. Ex. 1003 (Bryson Decl.), at ¶ 846.

2. Venrick 1939 Anticipates Claim 11 Of The '968 Patent

Claim 11 is directed to a method of applying an array of shingles that is substantially identical to the array of shingles described in claim 1 of the patent. As discussed above at § IV.A.1, Venrick 1939 discloses all of the elements of the array of shingles described in claim 1. Venrick 1939 also discloses coatings of granular material “on the asphaltic material,” which was “common practice” since at least the 1930s. *Supra* at § IV.A.1; Ex. 1003 (Bryson Decl.), at ¶¶ 50, 340, 341–343, 860; *see, e.g.*, Ex. 1013 (Venrick 1939), at 3, col. 1:4–7. Venrick 1939 anticipates claim 11. Ex. 1003 (Bryson Decl.), at ¶ 861.

3. Venrick 1939 Anticipates Claims 2 and 12 Of The '968 Patent

Venrick 1939 anticipates claims 1 and 11. Venrick 1939 also discloses a shingle that is “comprised of a single layer of shingle material with the front and

rear surfaces being on opposite sides of the single layer of shingle material.” Ex. 1003 (Bryson Decl.), at ¶ 847; Ex. 1013 (Venrick 1939), at 4, col. 1:3–9. In fact, the figures in Venrick 1939 show strip shingles, which were constructed from a single layer of shingle material and were common. *Supra* at § III.A.2.; Ex. 1003 (Bryson Decl.), at ¶ 46–47, 847; Ex. 1013 (Venrick 1939), at Figs. 1, 8; Ex. 1005 (Cash 1995), at 4. Venrick 1939 anticipates claims 2 and 12.

4. Venrick 1939 Renders Obvious Claims 3 and 13 Of The '968 Patent

Venrick 1939 anticipates claims 1 and 11. As explained above at § III.A.4, two-ply laminated shingles (which have “two layers of shingle material laminated together, with the front and rear surfaces being on opposite sides of the shingle”) were well known. Ex. 1003 (Bryson Decl.), at ¶¶ 50–51; *see, e.g.*, Ex. 1005 (Cash 1995), at Fig. 12, 4; Ex. 1011 (Malarkey 2000). The reinforcing layer disclosed in Venrick 1939 would have been understood to have applicability and the same beneficial results when used in all types of shingles, including the most common types of shingles such as laminated shingles. Ex. 1003 (Bryson Decl.), at ¶ 850. The application of the reinforcement layer in Venrick 1939 to such a shingle would have been an obvious design choice given the popularity of laminated shingles. *Id.* Venrick 1939 renders obvious claims 3 and 13.

5. Venrick 1939 Renders Obvious Claims 4 and 5 Of The '968 Patent

Claims 4 and 5 depend on claim 3 and claim one of the alternative “second reinforcement thickness layer” configurations of element (e) of claim 1. Claims 4 and 5 are therefore obvious for the same reasons claim 3 is obvious.

6. Venrick 1939 Anticipates Claims 8 and 9 Of The '968 Patent

Claims 8 and 9 depend on claim 1 and claim one of the alternative “second reinforcement thickness layer” configurations of element (e) of claim 1. Venrick 1939 anticipates claims 8 and 9 for the same reasons it anticipates claim 1.

7. Venrick 1939 Anticipates Claims 14 and 15 Of The '968 Patent

Claims 14 and 15 depend on claim 11 and claim one of the alternative “second reinforcement thickness layer” configurations of element (e) of claim 11. Claim 14 adds the further limitation that the “reinforcement second thickness layer” extend “toward the lower edge of the shingle” and claim 15 adds the further limitation that it extend “toward the upper edge of the shingle.” Each of these configurations is disclosed in Venrick 1939. *Supra*, at § IV.A.1. Venrick 1939 anticipates claims 14 and 15 for the same reasons that it anticipates claim 11.

8. Venrick 1939 Anticipates Claims 10 and 16 Of The '968 Patent

Venrick 1939 anticipates claims 9 and 15. Venrick 1939 also discloses “fasteners applied through the reinforcement second thickness layer, fastening the

shingles to the roof.” *Supra* § IV.A.1; Ex. 1013 (Venrick 1939), at 5, col. 1:51–56, Fig. 3; Ex. 1003 (Bryson Decl.), at ¶ 858. Venrick 1939 anticipates claims 10 and 16.

9. Venrick 1939 Anticipates Claim 6 Of The '968 Patent

Venrick 1939 discloses a “reinforcement second thickness layer” comprised of “a material selected from the group consisting of woven or non-woven: (i) thin fabric; (ii) plastic film; (iii) paper; (iv) parchment; (v) foil; and (vi) scrim.” Specifically, Venrick 1939 discloses that the reinforcing layer can be made of roofing tape, which was understood to be made of, among other things, paper. *Supra* at § IV.A.2; Ex. 1013 (Venrick 1939), at 4, col. 2:74–75; Ex. 1040 (U.S. Patent No. 1,524,090), at 2, col. 2:69–70, 2:90; Ex. 1003 (Bryson Decl.), at ¶ 854. Venrick 1939 therefore anticipates claim 6.

10. Venrick 1939 Anticipates Claim 7 Of The '968 Patent

Venrick 1939 anticipates claim 1. Venrick 1939 also discloses that “the reinforcement second thickness layer comprises means for increasing resistance to nail pull prior to failure.” *Supra* § IV.A.2; Ex. 1013 (Venrick 1939), at 4, col. 2:16–23 (“raised portion” gives “greater nailing strength”); Ex. 1003 (Bryson Decl.), at ¶ 855. Venrick 1939 anticipates claim 7.

11. Venrick 1939 Renders Obvious Claim 17 Of The '968 Patent

Claim 17 is directed to a shingle that is substantially identical to the shingles

described in claim 3 of the patent. The only additional requirement in claim 17 is claim element (h), which merely describes the standard two-ply laminated shingle and conventional features of a standard laminated shingle. Ex. 1003 (Bryson Decl.), at ¶ 867. As explained *supra* § IV.A.4, with respect to claim 3, such shingles were well known and the application of the reinforcement layer in Venrick 1939 to such a shingle would have been an obvious design choice. Laminated shingles exhibiting these features were known and common as evidenced by Fig. 2 of Bettoli 1975 (Ex. 1042), Fig. 10 of Cash 1995 (Ex. 1005) and ARMA Manual 1997 (Ex. 1009), at p. 12, Table 1. A shingle having the described features is also shown in Fig. 1 of the '968 patent (Ex. 1038), which the patent describes as “prior art.” Ex. 1003 (Bryson Decl.), at ¶ 867. Venrick 1939 therefore renders obvious claim 17.

12. Venrick 1939 Renders Obvious Claim 18 Of The '968 Patent

Venrick 1939 renders obvious claim 17. Venrick 1939 also discloses “[a]n array of shingles . . . applied to a roof, in courses,” as explained above with respect to claim 1. *See supra* § IV.A.1. Venrick 1939 therefore renders obvious claim 18.

B. Venrick 1939 (Ex. 1013) in View of Frankoski 1998 (Ex. 1010) Renders Obvious the Claims

U.S. Patent No. 5,882,943 to Frankoski (Frankoski 1998) (Ex. 1010) issued on October 20, 1998 and is prior art under 35 U.S.C. § 102(b). The '968 patent

refers to the laminated asphalt shingles described in Frankoski 1998 as the “basic” “prior art” shingle and incorporates by reference the disclosure of Frankoski 1998. Ex. 1038 (’968 patent), col. 3:10-13.

1. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 1 Of The ’968 Patent

Like Venrick 1939, Frankoski 1998 discloses a “basic” “prior art” asphalt shingle, *supra* at § III.A.4., and discloses an array of such shingles applied to a roof by fasteners in courses. Ex. 1010 (Frankoski 1998), at col. 2:62–67 (referring to “a roof constructed of such shingles” and “shingles in their final applied configuration”). Thus, like Venrick 1939, Frankoski 1998 meets all the limitations of the preamble of claim 1, as well as elements (a)-(c). *See supra* at § III.A.4.

Venrick 1939 and Frankoski 1998 also disclose element (d) of claim 1, which is another component of the basic prior art asphalt shingle. Specifically, Venrick 1939 shows that the longitudinal nailing zone (*i.e.*, fastening zone) is between the right and left edges of the shingle and generally intermediate the upper and lower edges. *Supra* at § IV.A.1. The nailing zone in Frankoski 1998 (Ex. 1010) is shown as 20 in Fig. 1 and is found in the same general location. Ex. 1003 (Bryson Decl.), at ¶ 876.

Element (e) of claim 1 provides “an at least partially externally visible generally longitudinal reinforcement second thickness layer of a substantially thinner dimension than said first thickness layer; said reinforcement second

thickness layer being adhered to an exterior surface of said shingle and extending at least substantially between right and left edges of the shingle.”

Frankoski 1998 discloses a scrim layer 60 that reinforces the asphalt shingle. Scrim is the preferred reinforcing material in the '968 patent. Ex. 1038, col. 1:61–63. Venrick 1939 discloses an at least partially externally visible longitudinal reinforcing layer that is adhered to the rear exterior surface of the shingle as a second thickness layer and extends between right and left edges of the shingle. Ex. 1003 (Bryson Decl.), at ¶¶ 349–350. Venrick 1939 (Ex. 1013) states that the reinforcing layer can be made of “felt, or metal ...or layer of roofing tape suitably bonded together.” *Id.* at 4, col. 2:73–5, col. 1:1. Given that the purpose of the scrim layer in Frankoski 1998 is reinforcement, the person of ordinary skill would have found it obvious to modify the asphalt shingle disclosed in Venrick 1939 with the scrim material disclosed in Frankoski 1998. Ex. 1003 (Bryson Decl.), at ¶ 879. This would have been considered an obvious design choice given the popularity of laminated shingles in the late 1990s and early 2000s. *Id.* at ¶¶ 51–52.

The person of ordinary skill would have been motivated to make such a change with the understanding that the scrim material disclosed in Frankoski 1998 is lighter and just as strong (if not stronger) than the materials disclosed in Venrick 1939. Ex. 1003 (Bryson Decl.), at ¶ 881. See *Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157 (Fed. Cir. 2007) (“adaption of an old idea” “in order to

gain the commonly understood benefits of such adaptation” is obvious). Frankoski 1998 expressly contemplates that the scrim layer can be positioned in any number of locations within the shingle. Ex. 1003 (Bryson Decl.) at ¶ 880.

The scrim material disclosed in Frankoski 1998 would be understood to be much thinner than the asphalt and granule coated mat material that would make up the shingle. *Id.* As in Venrick 1939 and other prior art such as Rohner 1989 and Sieling 1999 (*see supra* at § III.A.2), the person of ordinary skill would recognize that the scrim material of Frankoski 1998 could be attached to the rear exterior surface of the shingle as a second thickness layer. Ex. 1003 (Bryson Decl.), at ¶ 882. To accomplish this, it would be understood that the scrim material could be adhered using, for example, a cement, such as that which is disclosed in Venrick 1939. *Id.*; Ex. 1013 (Venrick 1939), at 4, col. 1:32-37.

The person of ordinary skill would have reasonably expected the thin scrim material in Frankoski 1998 to function as reinforcing material given the data in Frankoski 1998 showing that the scrim improved the strength of the asphalt shingle and other prior art such as Venrick 1939 and Olszyk 1974, which showed that thin material could be used for reinforcement, and that the material could be affixed to the rear surface of the shingle. Ex. 1003 (Bryson Decl.), at ¶ 883; *supra* at § III.A.2. and § III.A.3.

As discussed above at § IV.B.1, Venrick 1939 also shows that the

reinforcing strip extends (a) at least partially lower than the nailing area, toward the lower edge of the shingle and (b) at least partially into the fastening zone towards the upper edge of the shingle. Venrick 1939 explicitly states that the “shingles are nailed preferably about one inch above the upper ends of the tab defining openings and where the raised median strip is” Ex. 1013 (Venrick 1939), at 5, col. 1:51–53. Frankoski 1998 also states that the scrim will “coincide with at least a portion of the nail zone for the shingle and also extend into the shingle tab zone portions to provide added strength and increase the overall performance characteristics of the shingle.” Ex. 1010 (Frankoski 1998), at col. 5:29–42. Venrick 1939 in view of Frankoski 1998 renders obvious claim 1. Ex. 1003 (Bryson Decl.), at ¶ 884.

2. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 11 Of The '968 Patent

Claim 11 is directed to a method of applying an array of shingles that is substantially identical to the array of shingles described in claim 1 of the patent. As discussed above at § IV.B.1, Venrick 1939 in view of Frankoski 1998 discloses an array of shingles having each of these elements. Venrick 1939 and Frankoski 1998 also disclose coatings of granular material “on the asphaltic material,” and this was “common practice” since at least the 1930s. *Supra* at § III.A.1; Ex. 1003 (Bryson Decl.), at ¶ 900; *see, e.g.*, Ex. 1013 (Venrick 1939), at 3, col. 1:4–7; Ex. 1010 (Frankoski 1998), at col. 1:11–15. Venrick 1939 in view of Frankoski 1998

renders obvious claim 11.

3. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claims 2 and 12 Of The '968 Patent

Venrick 1939 in view of Frankoski 1998 renders obvious claims 1 and 11.

Venrick 1939 also discloses a shingle that is “comprised of a single layer of shingle material with the front and rear surfaces being on opposite sides of the single layer of shingle material.” Ex. 1003 (Bryson Decl.), at ¶ 901; Ex. 1013 (Venrick 1939), at 4, col. 1:3-9. The figures in Venrick 1939 show strip shingles, which were constructed from a single layer of shingle material and were common. *Supra* at § III.A.1; Ex. 1003 (Bryson Decl.), at ¶ 901; Ex. 1013 (Venrick 1939), at Figures; Ex. 1005 (Cash 1995), at 4. Venrick 1939 in view of Frankoski 1998 renders obvious claims 2 and 12.

4. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 3 and 13 Of The '968 Patent

Venrick 1939 in view of Frankoski 1998 renders obvious claims 1 and 11.

Frankoski 1998 describes and illustrates “a two-ply laminated shingle.” Ex. 1003 (Bryson Decl.), at ¶¶ 369-370; Ex. 1010 (Frankoski 1998), at col. 4:34, Fig. 1. Additionally, as explained above at § III.A.4, two-ply laminated shingles (which have “two layers of shingle material laminated together, with the front and rear surfaces being on opposite sides of the shingle”) were well known in the art. Ex. 1003 (Bryson Decl.), at ¶¶ 46, 51-52; *see, e.g.*, Ex. 1005 (Cash 1995), at 4, Fig. 12;

Ex. 1011 (Malarkey 2000). The person of ordinary skill would understand that the reinforcing layer disclosed in Venrick 1939 would have applicability and the same beneficial results when used in all types of shingles, including the most common types of shingles such as laminated shingles. Ex. 1003 (Bryson Decl.), at ¶ 888. The application of the reinforcement layer in Venrick 1939 and Frankoski 1998 to such a shingle would have been an obvious design choice given the popularity of laminated shingles. *Id.* Venrick 1939 in view of Frankoski 1998 renders obvious claims 3 and 13.

5. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claims 4 and 5 Of The '968 Patent

Claims 4 and 5 depend on claim 3 and claim one of the alternative “second reinforcement thickness layer” configurations of element (e) of claim 1. Claims 3 and 5 are obvious for the same reasons claim 3 is obvious.

6. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claims 8 and 9 Of The '968 Patent

Claims 8 and 9 depend on claim 1 and claim one of the alternative “second reinforcement thickness layer” configurations of element (e) of claim 1. They are obvious for the same reasons claim 1 is obvious.

7. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claims 14 and 15 Of The '968 Patent

Claims 14 and 15 depend on claim 11 and claim one of the alternative “second reinforcement thickness layer” configurations of element (e) of claim 11.

Claim 14 adds the further limitation that the “reinforcement second thickness layer” extend “toward the lower edge of the shingle” and claim 15 adds the further limitation that it extend “toward the upper edge of the shingle.” Each of these configurations is disclosed in Venrick 1939. *Supra*, at § IV.A.1. Venrick 1939 in view of Frankoski 1998 renders obvious claims 14 and 15 for the same reasons as claim 11.

8. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claims 10 and 16 Of The '968 Patent

Venrick 1939 in view of Frankoski 1998 renders obvious claims 9 and 11. Venrick 1939 and Frankoski 1998 also disclose “fasteners applied through the reinforcement second thickness layer, fastening the shingles to the roof.” *Supra* at § IV.A.1; Ex. 1013 (Venrick 1939), at 5, col. 1:51–56, Fig. 3; Ex. 1010 (Frankoski 1998), at col. 5:29–42; Ex. 1003 (Bryson Decl.), at ¶¶ 897–898. The concept of nailing the shingle through the reinforced layers was also known and would have been obvious. *Supra* at § III.A.2; Ex. 1003 (Bryson Decl.), at ¶ 897.

9. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 6 Of The '968 Patent

Venrick 1939 in view of Frankoski 1998 renders obvious claim 1. Venrick 1939 and Frankoski 1998 also disclose a “reinforcement second thickness layer” that “comprises a material selected from the group consisting of woven or non-woven: (i) thin fabric; (ii) plastic film; (iii) paper; (iv) parchment; (v) foil; and (vi)

scrim.” *Supra* at § IV.B.1; Ex. 1013 (Venrick 1939), at 4, col. 2:74-75 (roofing tape); Ex. 1040 (U.S. Patent No. 1,524,090), at 2, col. 2:90 (roofing tape is made of paper); Ex. 1010 (Frankoski 1998) at Abstract, 3:29– 30 (disclosing scrim); Ex. 1003 (Bryson Decl.), at ¶ 892. Venrick 1939 in view of Frankoski 1998 render obvious claim 6.

10. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 7 Of The '968 Patent

Venrick 1939 in view of Frankoski 1998 renders obvious claim 1. Venrick 1939 and Frankoski 1998 also disclose that “the reinforcement second thickness layer comprises means for increasing resistance to nail pull prior to failure.” Ex. 1003 (Bryson Decl.), at ¶ 893; *see, e.g.*, Ex. 1013 (Venrick 1939), at 4, col. 2:16–23 (“raised portion” gives “greater nailing strength”); Ex. 1010 (Frankoski 1998), at col. 3:20–24 (scrim layer “provides a superior strength and nail pull-through resistance”). Venrick 1939 in view of Frankoski 1998 renders obvious claim 7.

11. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 17 Of The '968 Patent

Claim 17 is directed to a shingle that is substantially identical to the shingles described in claim 3 of the patent. The only additional requirement in claim 17 is claim element (h), which merely describes the standard two-ply laminated shingle and conventional features of a laminated shingle. Ex. 1003 (Bryson Decl.), at ¶ 908. As explained *supra* § IV.B.4., with respect to claim 3, Frankoski 1998

describes and illustrates “a two-ply laminated shingle,” such shingles were well known in the art, and the application of the reinforcement layer in Venrick 1939 to such a shingle would have been an obvious design choice. Laminated shingles exhibiting these features were known and common as evidenced by Fig. 2 of Bettoli 1975 (Ex. 1042), Fig. 10 of Cash 1995 (Ex. 1005) and ARMA Manual 1997 (Ex. 1009) at 12, Table 1. Further, not only are shingles with the described characteristics shown Fig. 1 of Frankoski 1998, a shingle having these features is also shown in Fig. 1 of the ’968 patent (Ex. 1038), which the patent describes as “prior art.” Ex. 1003 (Bryson Decl.), at ¶ 908. Venrick 1939 in view of Frankoski 1998 therefore renders obvious claim 17.

12. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 18 Of The ’968 Patent

Venrick 1939 in view of Frankoski 1998 renders obvious claim 17. Venrick 1939 and Frankoski 1998 also discloses “[a]n array of shingles . . . applied to a roof, in courses,” as explained above with respect to claim 1. *See supra* § IV.B.2. Venrick 1939 in view of Frankoski 1998 therefore renders obvious claim 18.

C. Venrick 1939 (Ex. 1013) in View of Kiik 2001 (Ex. 1018) Renders Obvious the Claims Of The ’968 Patent

U.S. Patent Publication No. 2001/0055680 to Kiik (Kiik 2001) (Ex. 1018) published on December 27, 2001 and is prior art under 35 U.S.C § 102(a).

1. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claim 1 Of The '968 Patent

As discussed above at § IV.A.1, Venrick 1939 discloses all the elements of claim 1. Like Venrick 1939, Kiik 2001 discloses the “basic” “prior art” asphalt shingle, and discloses what the person of ordinary skill would understand to be an array of such shingles applied to a roof by fasteners in courses. Ex. 1018 (Kiik 2001), at [0003] (referring to “roofing materials on buildings, particularly the shingles on residential dwellings”); Ex. 1003 (Bryson Decl.), at ¶¶ 403, 911. Venrick 1939 and Kiik 2001 therefore each disclose the preamble and elements (a) – (d) of claim 1.

Venrick 1939 and Kiik 2001 also discloses elements (e) and (f) of claim 1. As discussed *supra* at § III.A.3, Kiik 2001 (Ex. 1018) discloses a “backing material” made of, among other things, polyester fibers, nylon fibers, rayon fibers, acrylic fibers, polyolefin fibers, polypropylene fibers and recycled plastics fibers. *Id.* at [0004]; Ex. 1003 (Bryson Decl.), at ¶ 912.

The backing material in Kiik 2001 is “adhered to the face of the back of the shingle.” Ex. 1018 (Kiik 2001), at [0007]. The purpose of the backing material in Kiik 2001 is reinforcement, *i.e.*, to provide the shingle with “better tear strength,” “pass impact tests despite their light product weight,” and provide “increased nail holding ability and maintain structural integrity at elevated temperatures.” *Id.* at [0009]; Ex. 1003 (Bryson Decl.), at ¶ 913.

Kiik 2001 states that the backing layer “may provide partial or full coverage” of the rear surface of the shingle and “enables the shingles to demonstrate enhanced physical properties.” Ex. 1018 (Kiik 2001), at [0010]. Given that one the purposes of the backing material is to improve “nail holding ability,” the person of ordinary skill would understand that the backing material of Kiik 2001 extends at least partially into the nailing zone and is generally longitudinal, extending at least substantially between right and left edges of the shingle. Ex. 1003 (Bryson Decl.), at ¶ 914.

Venrick 1939, like other prior art such as Rohner 1989 and Sieling 1999, discloses a reinforcing layer that is adhered to the rear exterior surface of the shingle as a second thickness layer. *Supra*, at § III.A.2; Ex. 1003 (Bryson Decl.), at ¶ 915. Given that the purpose of the backing material in Kiik 2001 is reinforcement, the person of ordinary skill would have found it obvious to modify the asphalt shingle disclosed in Venrick 1939 by using the backing material disclosed in Kiik 2001. *Id.*

Recognizing that the materials disclosed in Venrick 1939 are old, and that newer more state of the art materials have since been developed, the person of ordinary skill would have been motivated to make such a change with the understanding that the backing material disclosed in Kiik 2001 is lighter and just as strong (if not stronger) than the materials disclosed in Venrick 1939. Ex. 1003

(Bryson Decl.), at ¶ 916.

The backing material disclosed in Kiik 2001 is much thinner than the asphalt and granule coated mat material. *Id.* In fact, the exemplified backing material in Kiik 2001, which was made of polyester fiber, had a thickness on the order of 1/1000th of an inch. *Id.*; Ex. 1018 (Kiik 2001), at [Table 1].

As in Venrick 1939 and other prior art such as Rohner 1989 and Sieling 1999, *see supra* at § III.A.2., the person of ordinary skill would recognize that the backing material of Kiik 2001 could be attached to the rear exterior surface of the shingle as a second thickness layer. Ex. 1003 (Bryson Decl.), at ¶ 918. To accomplish this, the person of ordinary skill would also understand that the backing material of Kiik 2001 could be adhered to the rear surface using, for example, a cement, such as that which is disclosed in Venrick 1939. *Id.*

The person of ordinary skill would have reasonably expected the thin backing material of Kiik 2001 to function as reinforcing material given the data in the Kiik 199 reference showing that the thin material improved the strength of the asphalt shingle and other prior art such as Venrick 1939, Olszyk 1974, and Frankoski 1999 (discussed *supra* at § III.A.2-4), which showed that thin material could be used as reinforcement material for asphalt shingles. Ex. 1003 (Bryson Decl.), at ¶ 919.

As discussed above at § IV.A.1, Venrick 1939 also shows that the

reinforcing strip extends (a) at least partially lower than the nailing area, toward the lower edge of the shingle and (b) at least partially into the fastening zone towards the upper edge of the shingle. Kiik 2001 also states that the backing layer “may provide partial or ***full coverage***” of the rear surface of the shingle and “enables the shingles to demonstrate enhanced physical properties” Ex. 1018 (Kiik 2001), at [0010] (emphasis added). Such a configuration would be obvious given the purpose of increasing nail pull strength, as described in both Venrick 1939 and Kiik 2001. Ex. 1003 (Bryson Decl.), at ¶ 920. Venrick 1939 in view of Kiik 2001 renders obvious claim 1. *Id.*

2. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claim 11 Of the '968 Patent

Claim 11 is directed to a method of applying an array of shingles that is substantially identical to the array of shingles described in claim 1. As discussed above at § IV.C.1, Venrick 1939 in view of Kiik 2001 discloses an array of shingles having each of these elements. Venrick 1939 and Kiik 2001 also disclose coatings of granular material “on the asphaltic material,” and the person of ordinary skill would understand that this was “common practice” since at least the 1930s. *Supra* at § III.A.1; Ex. 1003 (Bryson Decl.), at ¶¶ 50, 936; *see, e.g.*, Ex. 1013 (Venrick 1939), at 3, col. 1:4–7; Ex 1018 (Kiik 2001), at [0005]. Venrick 1939 in view of Kiik 2001 renders obvious claim 11.

3. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claims 2 and 12 Of The '968 Patent

Venrick 1939 in view of Kiik 2001 renders obvious claim 1. Venrick 1939 and Kiik 2001 also disclose a shingle that is “comprised of a single layer of shingle material with the front and rear surfaces being on opposite sides of the single layer of shingle material.” Ex. 1003 (Bryson Decl.), at ¶¶ 921, 937; *see, e.g.*, Ex. 1013 (Venrick 1939), at 4, col. 1:3–9; Ex. 1018 (Kiik 2001), at [0001], [0002]. In fact, the figures in Venrick 1939 show strip shingles, which were constructed from a single layer of shingle material and were common. *Supra* at § III.A.1; Ex. 1003 (Bryson Decl.), at ¶ 921; Ex. 1013 (Venrick 1939), at Figures; Ex. 1005 (Cash 1995), at 4. Venrick 1939 in view of Kiik 2001 renders obvious claims 2 and 12.

4. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claims 3 and 13 Of The '968 Patent

Venrick 1939 in view of Kiik 2001 renders obvious claim 1. Kiik 2001 describes and illustrates “a standard laminated shingle product sold by Elk.” Ex. 1003 (Bryson Decl.), at ¶ 926; Ex. 1018 (Kiik 2001), at [0014]. Additionally, as explained above at § III.A.4, two-ply laminated shingles (which have “two layers of shingle material laminated together, with the front and rear surfaces being on opposite sides of the shingle”) were well known. Ex. 1003 (Bryson Decl.), at ¶¶ 50-51; *see, e.g.*, Ex. 1005 (Cash 1995), at 4, Fig. 12; Ex. 1011 (Malarkey 2000). The person of ordinary skill would understand that the reinforcing layer disclosed

in Venrick 1939 would have applicability and the same beneficial results when used in all types of shingles, including the most common types of shingles such as laminated shingles. Ex. 1003 (Bryson Decl.), at ¶ 924. The application of the reinforcement layer in Venrick 1939 and Kiik 1999 to such a shingle would have been an obvious design choice given the popularity of laminated shingles. *Id.* at ¶ 924. Venrick 1939 in view of Kiik 2001 renders obvious claims 3 and 13.

5. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claims 4 and 5 Of The '968 Patent

Claims 4 and 5 depend on claim 3 and claim one of the alternative “second reinforcement thickness layer” configurations of element (e) of claim 1. They are obvious for the same reasons claim 3 is obvious.

6. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claims 8 and 9 Of The '968 Patent

Claims 8 and 9 depend on claim 1 and claim one of the alternative “second reinforcement thickness layer” configurations of element (e) of claim 1. They are obvious for the same reasons claim 1 is obvious.

7. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claims 14 and 15 Of The '968 Patent

Claims 14 and 15 depend on claim 11 and claim one of the alternative “second reinforcement thickness layer” configurations of element (e) of claim 11. Claim 14 adds the further limitation that the “reinforcement second thickness layer” extend “toward the lower edge of the shingle” and claim 15 adds the further

limitation that it extend “toward the upper edge of the shingle.” Each of these configurations is disclosed in Venrick 1939. *Supra*, at § IV.A.1. Venrick 1939 in view of Kiik 2001 renders obvious claims 14 and 15 for the same reasons they render obvious claim 11.

8. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claims 10 and 16 Of The '968 Patent

Venrick 1939 in view of Kiik 2001 renders obvious claims 9 and 11.

Venrick 1939 also discloses “fasteners applied through the reinforcement second thickness layer, fastening the shingles to the roof.” Ex. 1013 (Venrick 1939), at 5, col. 1:51–56, Fig. 3. The nail pull data in Kiik 2001, described above at § III.A.3, confirms that nails applied to the shingle in Kiik 2001 passed through the the “backing material” in Kiik 2001. Ex. 1003 (Bryson Decl.), at ¶¶ 113, 408, 934. Additionally, the concept of nailing the shingle through the reinforced layers was also known and obvious, and such a configuration would have been obvious given the purpose of increasing nail pull strength described in Venrick 1939 and Kiik 2001. *Supra* § IV.C.1; Ex. 1003 (Bryson Decl.), at ¶ 934, 942. Venrick 1939 in view of Kiik 2001 renders obvious claims 10 and 16.

9. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claim 6 Of The '968 Patent

Venrick 1939 in view of Kiik 2001 renders obvious claim 1. Venrick 1939 and Kiik 2001 also disclose a “reinforcement second thickness layer” that

“comprises a material selected from the group consisting of woven or non-woven: (i) thin fabric; (ii) plastic film; (iii) paper; (iv) parchment; (v) foil; and (vi) scrim.”

Venrick 1939 discloses paper and Kiik 1999 discloses material that would be considered thin fabric. Ex. 1013 (Venrick 1939), at 4, col. 2:74-75; Ex. 1040 (U.S. Patent No. 1,524,090), at 2, col. 2:90; Ex. 1018 (Kiik 2001), at [0004], [0006]; Ex. 1003 (Bryson Decl.), at ¶ 929. Venrick 1939 in view of Kiik 2001 therefore renders obvious claim 6.

10. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claim 7 Of The '968 Patent

Venrick 1939 in view of Kiik 2001 renders obvious claim 1. Venrick 1939 and Kiik also disclose that “the reinforcement second thickness layer comprises means for increasing resistance to nail pull prior to failure.” *Supra* § IV.C.1; Ex. 1003 (Bryson Decl.), at ¶ 930; *see, e.g.*, Ex. 1013 (Venrick 1939), at 4, col. 2:16–23 (“raised portion” gives “greater nailing strength”); Ex. 1018 (Kiik 2001), at [0009] (“demonstrate increased nail holding ability”). Venrick 1939 in view of Kiik 2001 therefore renders obvious the claim 7.

11. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claim 17 Of The '968 Patent

Claim 17 is directed to a shingle that is substantially identical to the shingles described in claim 3 of the patent. The only additional requirement in claim 17 is claim element (h), which merely describes the standard two-ply laminated shingle and

conventional features of a standard laminated shingle. Ex. 1003 (Bryson Decl.), at ¶ 943. As explained *supra* at § IV.C.4, with respect to claim 3, Kiik 2001 describes a standard two-ply laminated shingle, such shingles were well known, and the application of the reinforcement layer in Venrick 1939 and Kiik 2001 to such a shingle would have been an obvious design choice. Laminated shingles exhibiting these features were known and common as evidenced by Fig. 2 of Bettoli 1975 (Ex. 1042), Fig. 10 of Cash 1995 (Ex. 1005) and ARMA Manual 1997 (Ex. 1009) at p. 12, Table 1. A shingle having the described features is also shown in Fig. 1 of the '968 patent (Ex. 1038), which the patent describes as “prior art.” Ex. 1003 (Bryson Decl.), at ¶ 934. Venrick 1939 in view of Kiik 2001 therefore renders obvious claim 17.

12. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claim 18 Of The '968 Patent

Venrick 1939 in view of Frankoski 1998 renders obvious claim 17. Venrick 1939 and Frankoski 1998 also discloses “[a]n array of shingles . . . applied to a roof, in courses,” as explained above with respect to claim 1. *See supra* § IV.C.1. Venrick 1939 in view of Frankoski 1998 therefore renders obvious claim 18.

D. Secondary Considerations Do Not Weigh In Favor of Nonobviousness

To the extent that the Patent Owner argues that the commercial success of Petitioner’s products bears on the question of the obviousness of the claims of the

'968 patent, Petitioner responds as follows: First, secondary considerations only apply in an obviousness analysis. Second, Petitioner's products do not have a nexus to the claims of the '968 patent because the products fall outside the scope of the claims. Ex. 1003 (Bryson Decl.), at ¶ 948. Among other reasons, the claims require that the "second reinforcement thickness layer" be attached to the "first thickness layer," *i.e.*, the layer comprising the base mat coated with asphalt and granules. But any reinforcement layer on Petitioner's products is attached directly to the asphalt as opposed to the "first thickness layer." *Id.* at ¶ 949.

Even if Petitioner's products were covered by the claims of the '968 patent (and they are not), their commercial success is not attributable to the subject matter of the claims. A variety of different factors drive the decision to purchase a particular shingle. *Id.* at ¶ 950. These factors include cost, color, shape, ease of installation, warranty, and dollars spent marketing the product. To the extent consumers purchase Petitioner's products, those sales would be driven by all of these factors. *Id.*

In fact, the primary reason why consumers purchase Petitioner's product is because it is an asphalt shingle. *Id.* at ¶ 951. The basic asphalt shingle, however, has been known for decades. Even if it is alleged that Petitioner's products include a "reinforcement second thickness layer" that meets all the limitations of the claims, this feature was also known for decades. *Id.* Thus, any commercial

success enjoyed by Petitioner's products are not relevant. *Gnosis S.P.A. v. South Alabama Med. Sci. Found.*, IPR2013-00116, Paper No. 68, at 32-42 (PTAB June 20, 2014) (“[A] showing of nexus ... involves establishing that novel elements in the claim, not prior-art elements, account for the objective evidence put forward to show nonobviousness.”). Ultimately, the Patent Owner bears the burden of proving secondary considerations. If Patent Owner sets forth evidence, Petitioner reserves the right to respond with additional evidence and argument.

V. CONCLUSION

For the foregoing reasons, the Petitioner respectfully requests that Trial be instituted and that claims 1–18 of the '968 patent be canceled.

Dated: August 29, 2014

Respectfully Submitted,

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PETITION FOR INTER PARTES REVIEW

OF U.S. PATENT NO. 8,615,968

Attachment A:

Proof of Service of the Petition

CERTIFICATE OF SERVICE

I hereby certify that on this 29th day of August 2014, a copy of this
PETITION FOR INTER PARTIES REVIEW has been served in its entirety by
Federal Express on the following counsel of record for patent owner:

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PETITION FOR INTER PARTES REVIEW

OF U.S. PATENT NO. 8,615,968

Attachment B:

List of Evidence and Exhibits Relied Upon in Petition

Appendix B

Exhibit #	Reference Name
1001	U.S. Patent No. 7,781,046
1002	U.S. Patent No. 7,781,046 File Wrapper (U.S. Application No. 12/422,506) (filed April 13, 2009)
1003	Declaration of Michael L. Bryson
1004	Curriculum Vitae of Michael L. Bryson
1005	Cash, <i>Asphalt Roofing Shingles</i> , Proc. 11 th Conf. Roofing Tech. 1-9 (Sept. 21–22, 1995)
1006	U.S. Patent No. 3,998,685
1007	Noone et al., <i>Asphalt-Shingles – A Century of Success and Improvement</i> , Proc. 11 th Conf. Roofing Tech. 23-33 (Apr. 22–23, 1993)
1008	U.S. Patent No. 2,099,131
1009	<i>ARMA Residential Roofing Manual</i> (1997)
1010	U.S. Patent No. 5,822,943
1011	U.S. Patent No. 6,145,265
1012	U.S. Patent No. 2,197,972
1013	U.S. Patent No. 2,161,440
1014	U.S. Patent No. 3,813,280
1015	U.S. Patent No. 4,875,321
1016	U.S. Patent No. 5,860,263
1017	U.S. Patent No. 6,228,785
1018	U.S. Patent Publication No. 2001/0055680
1019	U.S. Patent No. 6,341,462

Exhibit #	Reference Name
1020	U.S. Patent No. 5,577,361
1021	U.S. Patent No. 6,397,556
1022	U.S. Patent No. 5,571,596
1023	U.S. Application No. 11/421,893 (filed on June 2, 2006)
1024	U.S. Application No. 10/871,911 (filed on June 18, 2004)
1025	U.S. Application No. 10/288,747 (filed on November 6, 2002)
1026	U.S. Patent No. 6,758,019
1027	U.S. Patent No. 7,118,794
1028	U.S. Patent No. 7,537,820
1029	U.S. Application No. 12,857,868 (filed on August 17, 2010)
1030	U.S. Application No. 13/291,234 (filed on November 8, 2011)
1031	U.S. Application No. 13/462,159 (filed on May 2, 2012)
1032	U.S. Application No. 13/788,029 (filed on March 7, 2013)
1033	U.S. Application No. 13/855,820 (filed on April 3, 2013)
1034	U.S. Patent No. 8,173,243
1035	U.S. Patent No. 8,383,228
1036	U.S. Patent No. 8,409,689
1037	U.S. Patent No. 8,592,025
1038	U.S. Patent No. 8,615,968
1039	The American Heritage Dictionary of the English Language, 4th Ed. (2000), pp. 21, 583, 1472

Exhibit #	Reference Name
1040	U.S. Patent No. 1,524,090
1041	U.S. Patent No. 5,052,162
1042	U.S. Patent No. 3,921,358
1043	Consumer Reports Rating the Supermarkets – Shingles and siding , pp. 26-30 (Aug. 1997)
1044	ASTM, Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules (D 3462-02) (published March 2002), pp. 161-165
1045	Complaint, <i>CertainTeed Corp. v. Owens Corning</i> , Civ. A. No. 1:14-cv-00510-SLR (D. Del.)