

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Owens Corning Corporation,  
Petitioner

v.

CertainTeed Corporation,  
Patent Owner

Patent No. 8,383,228

Issued: February 26, 2013

Filed: November 8, 2011

Inventors: Husnu M. Kalkanoglu and Stephen A. Koch

Title: SHINGLE WITH REINFORCEMENT LAYER

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*Inter Partes* Review No. 2014- 01401

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**PETITION FOR INTER PARTES REVIEW**

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Petition for *Inter Partes* Review of U.S. Patent No. 8,383,228

**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. 8,383,228 (“the ’228 patent”) (Ex. 1035). Neither Petitioner, nor any party in privity with Petitioner: (i) has filed a civil action challenging the validity of any claim of the ’228 patent; or (ii) has been served a complaint alleging infringement of the ’228 patent more than one year prior to the present date. Also, the ’228 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 ’228 patent on April 22, 2014 resulting in Civ. A. No. 1:14-cv-00510-SLR (D. Del.). *See* 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 '228 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. Patents related to the '228 patent, by continuation, are the subject of petitions for *inter partes* review filed concurrently herewith (IPR Nos. 2014-01397, 2014-01402-01404).

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

<u>Lead Counsel</u> Jeffrey P. Kushan Reg. No. 43,401 <a href="mailto:jkushan@sidley.com">jkushan@sidley.com</a> (202) 736-8914	<u>Backup Lead Counsel</u> Peter S. Choi Reg. No. 54,033 <a href="mailto:peter.choi@sidley.com">peter.choi@sidley.com</a> (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 1–22 of the '228 patent are unpatentable. Specifically:

- (1) Claims 1–3, 13–15, and 19–21 are anticipated under § 102(b) by Venrick 1939.
- (2) Claims 4–12, 16–18, and 22 would have been obvious under § 103



based on Venrick 1939.

- (3) Claims 1–22 would have been obvious under § 103 based on Venrick 1939 in view of Frankoski 1998.
- (4) Claims 1–22 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 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. 11<sup>th</sup> 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. 11<sup>th</sup> 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.

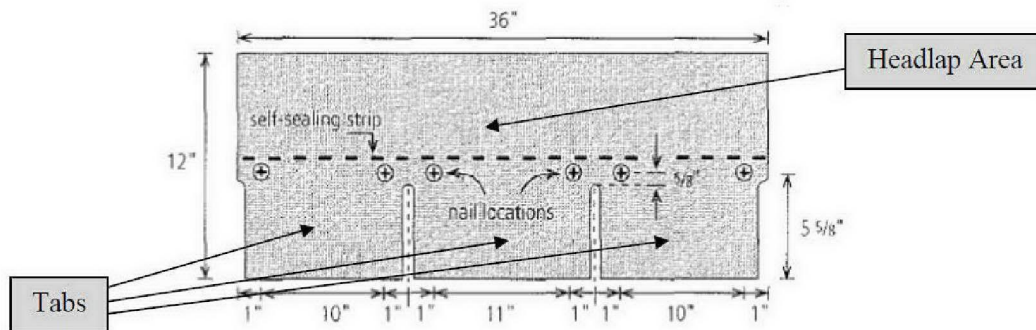
The basic steps for making an asphalt shingle, including coating both sides of the base mat (*i.e.*, substrate) with asphalt and applying granular material on both sides, have remained the same for decades. Ex. 1003 (Bryson Decl.), at ¶¶ 49–50. U.S. Patent No. 2,099,131 to Miller (issued in 1937) (Miller 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 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), 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. The nailing zone is (a) generally longitudinal like the shingle itself, (b) located between the right and left shingle edges, and (c) generally intermediate of the upper and lower edges. *Id.* at ¶¶ 57–58.

Claim 1 of the '228 patent provides: “[a] shingle having front and rear surfaces, a width defined by upper and lower edges and a length defined by right and left edges, including an upper headlap portion and a lower tab portion.”

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 both front and rear surfaces and adhered thereto, 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. 1035 ('228 patent), at col. 6:61–7:3. 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 '228 patent acknowledges that the components of the “basic” asphalt shingle were known in the prior art. *Id.* at ¶¶ 59–68; Ex. 1035 ('228 patent), at col. 3:3–6.

To the basic asphalt shingle, elements (e)-(f) of claim 1 of the '228 patent add and describe a “reinforcement second thickness layer”:

- (e) an at least partially externally visible generally longitudinal reinforcement second thickness layer of a substantially thinner dimension than said first thickness layer, 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 layer extending across a lower end of a headlap portion; wherein said reinforcement layer comprises a material selected from the group consisting of woven or nonwoven: (i) thin fabric; (ii) plastic film; (iii) paper; (iv) parchment; (v) foil; and (vi) scrim.

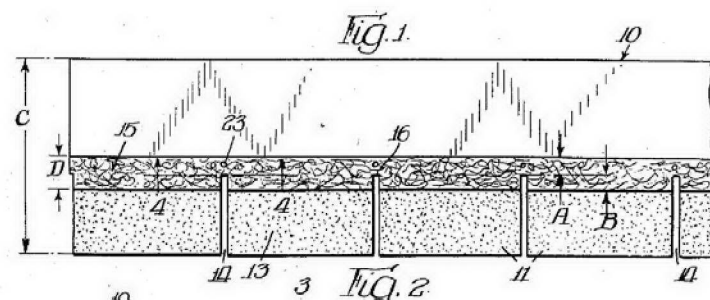
Ex. 1035 ('228 patent), at col. 7:3–18; *see also id.* at col. 3:16–17 (“the shingle 20 is similar to that of the [prior art] shingle 10 of FIG. 1, but with a reinforcement

layer”). Reinforcement layers having the claimed features were known in the prior art. Ex. 1003 (Bryson Decl.), at ¶¶ 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.

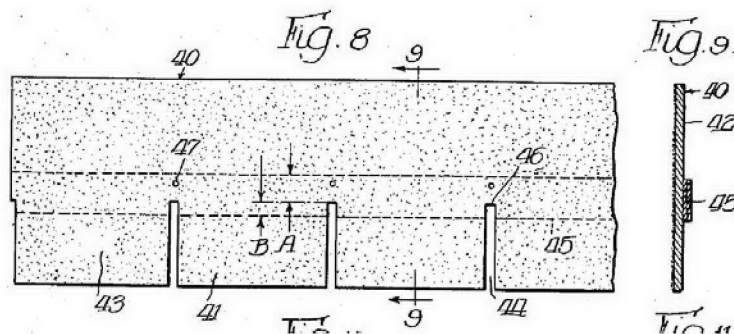
The Venrick 1939 strip, which may be made of, *inter alia*, felt, metal, or “layers of roofing tape,” Ex. 1013 (Venrick 1939), at 4, col. 2:74–75, also functions to add “rigidity” to “resist[] the action of the wind.” *Id.* at 5 col. 1:1–9; Ex. 1003 (Bryson Decl.), at ¶ 94. “[I]mproved resistance to failure upon bending” is also a function of the reinforcement layer in the ’228 patent. Ex. 1035 (’228 patent), at col. 5:54–55; 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 placed 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,” *Id.* at 4, col. 2:11–23; Ex. 1003 (Bryson Decl.), at ¶ 96.

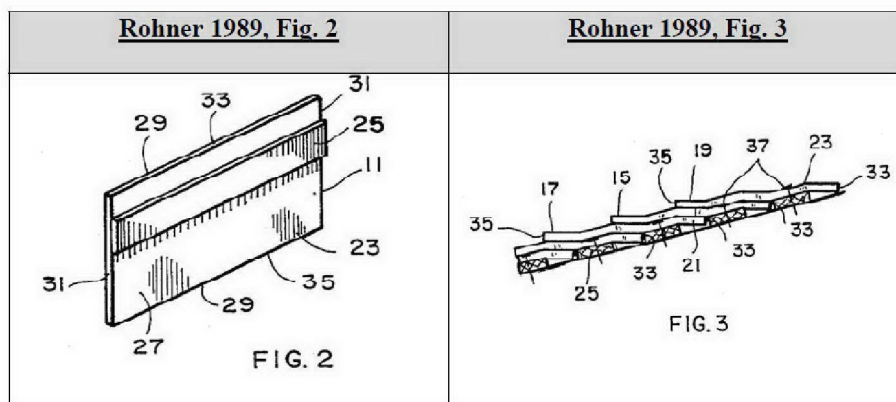
Figs. 8 and 9 of Venrick 1939 show the reinforcement strip 45 as a visible component that is adhered to the exterior rear surface of the shingle and extending at least partially into the zone having nailing holes 47. Ex. 1013 (Venrick 1939); Ex. 1003 (Bryson Decl.), at ¶ 97. It extends at least partially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



It was known in the art that nailing through multiple layers of shingle material provided strength and contributed to roofing integrity. *Id.* at ¶ 98. *E.g.*, U.S. Patent No. 6,145,265 (Malarkey 2000) (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.”).

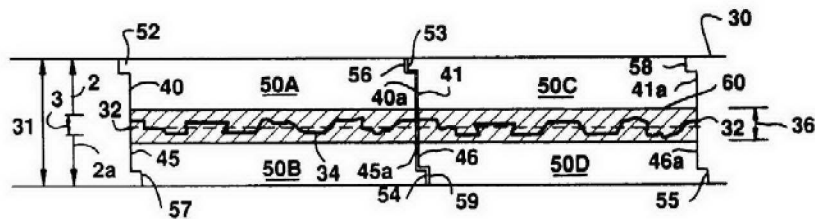
Examples of reinforcing layers affixed to the rear surface abound. U.S. Patent No. 4,875,321 to Rohner (Rohner 1989) (Ex. 1015) discloses a “backing strip” (Fig. 2, 25) made of “light-weight weather-resistant material” to “provide a stiffer shingle which grips the nails.” *Id.* at col. 1:55–59; Ex. 1003 (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 surface, and is longitudinal. 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 the person of ordinary skill would understand 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 is on the exterior surface and forms a second thickness layer and is longitudinal in orientation. Ex. 1003 (Bryson Decl.), at ¶ 106.

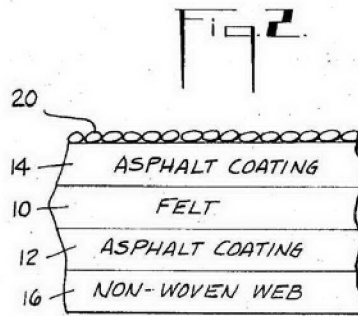
### 3. The Prior Art Taught Thin Reinforcement Material

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. *Id.* 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) shows a nonwoven web layer 16 affixed to the back of an asphalt shingle. Ex. 1003



(Bryson Decl.), at ¶ 99.



Among other things, the purpose of the web layer is “adding reinforcement ...and providing additional tear strength.” Ex. 1014 (Olszyk 1974), at col. 4:17–27 (emphasis added). The thickness of the web is on the order of 1/1000<sup>th</sup> 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.

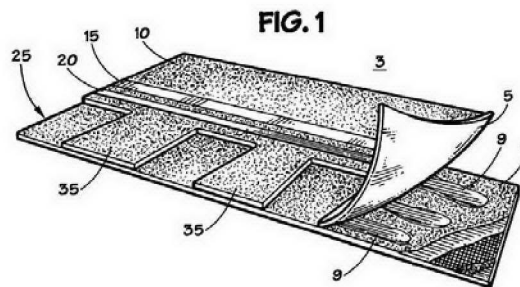
U.S. Patent Publ. No. 2001/0055680 to Kiik (Kiik 2001) (Ex. 1018) discloses an asphalt roof shingle having a “backing material” adhered to the rear surface that can be made of woven polyester and latex fiber bound by latex. *Id.* at [0004], [0006]; Ex. 1003 (Bryson Decl.), at ¶ 110. The exemplary backing materials have a thickness of 13 or 23 1/1000<sup>th</sup> of an inch. Ex. 1018 (Kiik 2001), at [Table 1]; Ex. 1003 (Bryson Decl.), at ¶ 110. Data in Kiik 2001 show that the reinforced shingles exhibited improved tear strength and nail pull strength. Ex. 1018 (Kiik 2001), at Table 1 and 2; Ex. 1003 (Bryson Decl.), at ¶ 113. Like Venrick 1939, Olszyk 1974, and 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 '228 patent incorporates by reference Frankoski 1998 and says that the “basic” asphalt shingle can be made according to its teachings. Ex. 1035 ('228 patent), at col. 3:3–6.

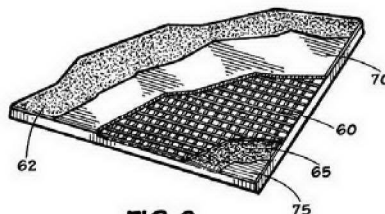
Frankoski 1998 (Ex. 1010) also discloses a laminated shingle. Ex. 1003 (Bryson Decl.), at ¶ 71. A laminated shingle is simply a shingle made of two layers that are glued together. *Id.* This is shown in Figure 1 of Frankoski 1998 (Ex. 1010).



The shingle comprises an upper layer 5 and a lower layer 7, which are glued together with a sealant 9. Ex. 1010 (Frankoski 1998), at col. 4:23–25; Ex. 1003 (Bryson Decl.), at ¶ 72. The upper layer includes a headlap 10 and a number of tabs 35. Ex. 1010 (Frankoski 1998), at 4:25–31; Ex. 1003 (Bryson Decl.), at ¶ 72. The lower layer is longitudinal, and extends between the right and left edges. Ex. 1003 (Bryson Decl.), at ¶ 72.

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 by enabling a roofer to nail through two, rather than one, layer of material. *Id.* at ¶ 76. 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 recognized to add reinforcement. Ex. 1003 (Bryson Decl.), at ¶ 76.

Fig. 2 of Frankoski 1998 (Ex. 1010) also shows a scrim layer 60 that is used as a component of the laminated shingle. *Id.* at ¶¶ 77-78.



Scrim is thin material that can be made from any number of different fabrics, synthetic, or composite materials. Ex. 1003 (Bryson Decl.), at ¶¶ 77–78. 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 explicitly 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 is the scrim 60 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 '228 Patent**

The '228 patent (Ex. 1035) issued on February 26, 2013, to Kalkanoglu and Koch and is entitled “Shingle With Reinforcement Layer.” Col. 1:1.

### **1. The '228 Patent Recognizes the Basic Asphalt Shingle Was Known**

The '228 patent acknowledges that the basic components of an asphalt shingle were known in the prior art. Ex. 1035 ('228 patent), at col. 2:49-3:6. Referring to Fig. 1, the '228 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. 2:49–59. The ’228 patent states that the “basic” prior art shingle can be made by the methods disclosed in, among other references, Frankoski 1998. *Id.* at col. 3:3–6; Ex. 1003 (Bryson Decl.), at ¶ 70.

## 2. Only a Rear Exterior Surface Reinforcement Layer Is Disclosed in the ’228 Patent

The person of ordinary skill would understand that the reinforcement layer disclosed in the ’228 patent is affixed to the rear surface of the asphalt shingle, and nowhere else. Ex. 1003 (Bryson Decl.), at ¶ 175.

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. 1035 (’228 patent), at col. 1:51–53 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 137, 161, 175.

The figures in the ’228 patent show the reinforcement layer to be located on the rear. Ex. 1003 (Bryson Decl.), ¶¶ 138–148, 161, 175. Fig. 2 shows the prior art with “a reinforcement layer applied to the rear surface thereof, in accordance with the present invention.” Ex. 1035 (’228 patent), at col. 2:17–19 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 139, 161, 175. Figure 3 also shows the “rear surface” of the shingle. *Id.* at ¶¶ 141, 161, 175.

Indeed, the specification consistently emphasizes that the reinforcement

layer is located on the “rear surface.” *See, e.g.*, Ex. 1035 (’228 patent), at Figs. 4 and 4A (reinforcement layer 29 on rear surface of shingle); col. 1:52–53 (“a separate, exterior reinforcement layer is provided ***outside the rear surface***”); col. 3:17–20 (“a reinforcement layer . . . ***added on the rear*** 21 of the shingle”); col. 4:11–12 (“the scrim ***46 applied to the undersurface***”); col. 5:50–6:50 (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); *see* Ex. 1003 (Bryson Decl.), at ¶¶ 143, 161, 175. 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. 1035 (’228 patent), at col. 3:61–4:1; Ex. 1003 (Bryson Decl.), at ¶¶ 144, 161, 175. Placement on the rear is also described to be critical to performance. Ex. 1003 (Bryson Decl.), at ¶¶ 145, 161, 175. Figure 4 of the ’228 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. 1035 (’228 patent),

at col. 4:8–16 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 145-147, 161, 175.

**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. 1035 (’228 patent), at col. 3:63-64 (emphasis added); Ex. 1003 (Bryson Decl.), at ¶¶ 149–151, 161, 175.

The claims of the ’228 patent all require a reinforcement layer that is “adhered” to the shingle. Ex. 1035 (’228 patent), at col. 6:55–8:63. 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.

**4. The Reinforcing Layer Provides Strength and Stability**

The function of the reinforcement layer described in the ’228 patent is to provide additional strength and stability to the shingle. Ex. 1003 (Bryson Decl.), at ¶¶ 154-160, 161, 175. As discussed, the purpose of the alleged invention is to, among other things, provide “improved resistance to damage due to wind uplift.” Ex. 1035 (’228 patent), at col. 5:58–60. Another purpose of the reinforcement layer is to “resist tearing.” *Id.* at col. 4:33–43. 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. 4:59–6:35.

**C. Prosecution History and Effective Filing Date of the '228 Patent**

The '228 patent issued on February 26, 2013, from U.S. Application No. 13/291,234, filed on November 8, 2011. *Id.* at 1. Venrick 1939 was not before the Patent Office during prosecution. Ex. 1003 (Bryson Decl.), at ¶¶ 268–276.

**1. Prosecution of Related Patent Applications**

The '234 application that resulted in the issuance of the '228 patent is related, by continuation, to a number of other applications filed before and after the issuance of the '228 patent. Frankoski 1998 played a prominent role during the prosecution of several of these applications. Patent Owner first 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 then 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. Ex. 1027 ('794 patent), at 1. It issued on October 10, 2006, as U.S. Patent No. 7,118,794. *Id.*; 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. Ex. 1003 (Bryson Decl.), at ¶ 237.

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.” Ex. 1024 (’911 Appl. File Wrapper), at 67-71. 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, apparently persuaded by the Patent Owner’s arguments, withdrew the rejections based on Frankoski 1998 and allowed the application to issue. *See id.* at 119.

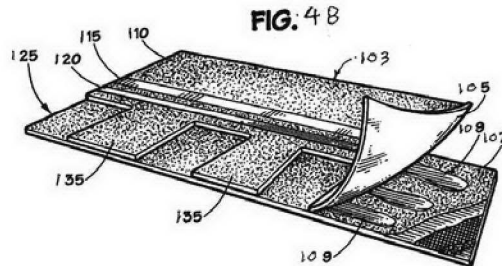
**b) U.S. Appl. No. 12/857,868**

U.S. Appl. No. 12/857,868, filed on August 17, 2010 claims to be a continuation of the ’506 application and issued on May 8, 2012, as U.S. Patent No. 8,173,243. Ex. 1034 (’243 patent), at 1; 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 of the addition: 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 handwritten 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 Frankoski 1998 except for the re-numbering of the items. 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.***”

See Ex. 1029 ('868 Appl. File Wrapper), at 51; Ex. 1034 ('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 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 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. Ex. 1029 (’868 Appl. File Wrapper), at ¶ 117. 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 the appeal, the Examiner allowed the claims and the application issued as the ’243 patent. *Id.* at 180; Ex. 1003 (Bryson Decl.), at ¶ 259.

## **2. Effective Filing Date of the Claims**

For the purposes of this proceeding, Petitioner will assume that the effective filing date of claims 1–22 of the ’228 patent is not earlier than November 6, 2002, the earliest filing date of any application to which the ’228 patent claims priority. Ex. 1003 (Bryson Decl.), at ¶ 45.

### **D. Person of Ordinary skill**

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. *Id.* 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. *See* 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 ’228 patent itself acknowledges that basic asphalt shingle was known. Ex. 1035 (’228 patent), at col. 2:49–3:2; 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 together form a first thickness layer. *Id.* at ¶ 318.

#### **2. “said shingle”**

Claim 1 uses the term “shingle” repeatedly. “Shingle” is used in the preamble to describe the claimed product as a whole. “Shingle” also appears in element (e), describing the location where the “reinforcement second thickness layer” is “adhered.” Ex. 1035 (’228 patent), at col. 6:57–7:18; Ex. 1003 (Bryson

Decl.), at ¶ 321. “Shingle” is not defined in the specification. Ex. 1003 (Bryson Decl.), at ¶ 321.

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 ¶ 322. 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. *Id.* at ¶ 323. In the preamble, the term “shingle” clearly refers to the claimed product as a whole, which includes a “reinforcement second thickness layer.” *Id.* at ¶ 324. But in element (e), the “said shingle” 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 ¶ 325.

To make any sense of this otherwise illogical claim, the “said shingle” in element (e) should be interpreted to mean the “first thickness layer” identified in

element (c). *Id.* at ¶¶ 326–327. Claim 1 requires a distinct “first thickness layer” and a distinct “reinforcement second thickness layer.” *Id.* at ¶ 327. 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 both front and rear surfaces.” *Id.* 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 ¶ 328.

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 ¶¶ 328–329. 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 there is 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. 1035 (’228 patent), at col. 3:64–66; Ex. 1003 (Bryson Decl.), at ¶ 330. “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 ¶ 330. Figs. 2A, 4 and 4A are in accord as each shows the reinforcement layer as a distinct thickness layer. *Id.* at ¶ 330.

Thus, the meaning of the term “said shingle” in element (e) of claim 1 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 first thickness layer, as discussed further below. *Id.*

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 of the 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 layer” is “adhered.” *Id.* at ¶ 331.

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

Claims 1, 13, and 19 require that the “reinforcement second layer” be “adhered” to “an exterior surface of said shingle.” The specification of the ’228



patent describes how the “reinforcement second 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. 1035 (’228 patent), at col. 3:63–4:2 (emphasis added).

A clear distinction is being drawn between an “embedded” layer and one that is “adhered.” Ex. 1003 (Bryson Decl.), at ¶¶ 305, 332. 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.

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, 332. In the asphalt roofing field, embedded material is mechanically affixed into surrounding material, such as asphalt. Ex. 1003 (Bryson Decl.), at ¶¶ 306, 332. In other words, physical contact and overlap results in attachment.

“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, 332. Unlike “embedded” material, when materials are said to be “adhered,” the person of ordinary skill would understand that 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 ’228 patent, where a clear distinction is being drawn between “adhered” and “embedded.” Ex. 1003 (Bryson Decl.), at ¶¶ 307, 332.

While no examples of “embedded” material are described in the patent, the patent does describe how the reinforcing layer is “adhered” to the shingle. *Id.* at ¶¶ 307, 332. Specifically, the ’228 patent states that the reinforcement layer is adhered by an “additional” thin layer of asphalt or non-asphaltic adhesive. Ex. 1035 (’228 patent), at col. 3:64–66. In other words, additional material is used as an adhesive. Ex. 1003 (Bryson Decl.), at ¶¶ 308, 332. 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, 332.

Further, the person of ordinary skill would understand that the “reinforcement second layer” is “adhered” to the rear surface of the “shingle,” *i.e.*,

the “first thickness layer.” *Id.* at ¶¶ 310, 332. As discussed *supra* at § III.B., the clear focus of the invention is a reinforcing layer that is attached to the rear surface. 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 is on the rear surface. *See supra* at § III.C.

Petitioner recognizes that claims 2, 14, and 20 of the ’228 patent require that that the “reinforcement layer” of element (e) be “adhered to the rear surface of the shingle.” Ex. 1035 (’228 patent), at col. 7:18–18, 8:7–8, 8:55–56. But the doctrine of claim differentiation cannot overcome a contrary construction dictated by the written description and prosecution history. *E.g., Microsoft Corp. v. Proxyconn, Inc.*, Case IPR2012-00026, 2013 WL 6327750, at \*3 (PTAB Feb. 25, 2013) (“Petitioner’s claim differentiation argument is inconsistent with the specification and the figures showing three signals and is therefore unavailing.”). Here, the specification and prosecution clearly compel a construction that requires the “reinforcement second thickness layer” of the independent claims of the ’228 to be adhered to the rear of the shingle.

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.” Ex. 1003 (Bryson Decl.), at ¶¶ 310–311, 332.

**4. “reinforcement . . . layer”**

The broadest reasonable construction of “reinforcement . . . 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. *Id.* at ¶¶ 312, 332.

**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. *Id.* at ¶¶ 314, 332. 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 element (f) of the independent claims of the ’228 patent specifically requires that the “reinforcement second layer” be made of woven or nonwoven thin fabric, plastic film, paper, parchment, foil, or scrim, these materials can vary in thickness. *Id.* at ¶¶ 314-315, 332. Thus, these examples shed no light on what the term “substantially thinner” means. *Id.* The figures in the ’228 patent confuse things further. *Id.* at ¶¶ 316, 332. 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, Petitioner 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. *Id.* at ¶¶ 317, 332.

#### **IV. Precise Reasons for Relief Requested**

##### **A. Claims 1–22 Are Unpatentable Over Venrick 1939**

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). Venrick 1939 anticipates claims 1–3, 13–15, and 19–21 and renders obvious claims 4–12, 16–18, and 22 of the ’228 patent.

##### **1. Venrick 1939 Anticipates Claim 1**

The preamble and elements (a)-(d) of claim 1 describe nothing more than the components of a basic asphalt shingle. Ex. 1003 (Bryson Decl.), at ¶ 46–68; *see supra* at § III.A.1. The ’228 patent acknowledges that these components were known in the prior art. Ex. 1035 (’228 patent), at col. 2:49–3:2.

Venrick 1939 also discloses the basic asphalt shingle. Ex. 1003 (Bryson

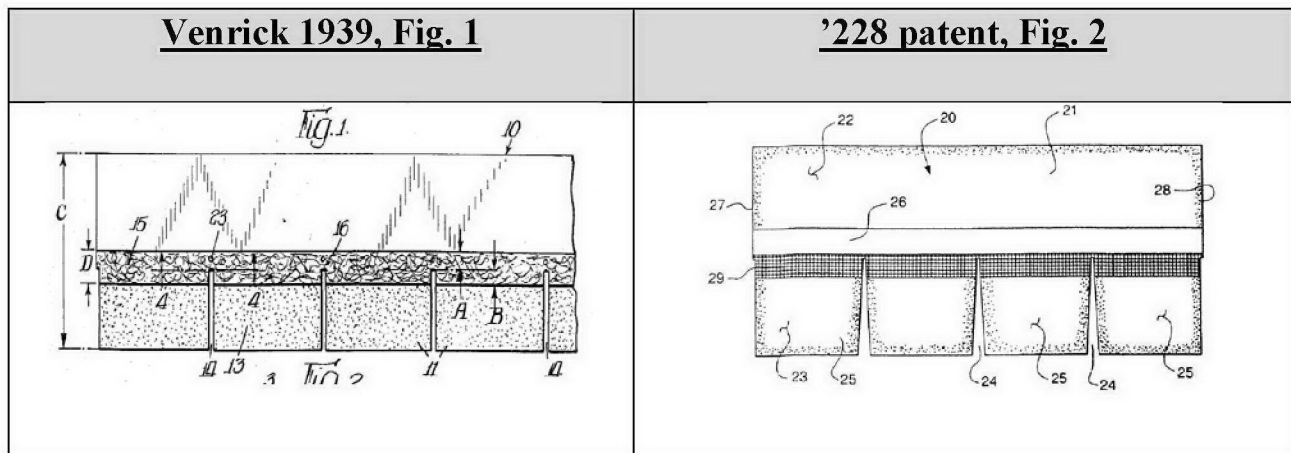
Decl.), at ¶ 341–343. Venrick 1939 (Ex. 1013) discloses a “fabricated shingle strip consisting of a base of fibrous material to which asphalt or similar plastic material is applied and which is surfaced with comminuted or granular material.” *Id.* at 3, col. 1:1–7. The base mat in Venrick 1939 would have been understood to have a front surface and a rear surface, a width defined by upper and lower edges, and a length defined by right and left edges. Ex. 1003 (Bryson Decl.), at ¶ 341. 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. *Id.* at ¶ 342–343; Ex. 1013 (Venrick 1939), at 3, col. 2:47–51; Ex. 1008 (Miller 1937), at 3, col. 1:13–14. 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 of the shingle and between or intermediate the upper and lower edges of the shingle. Ex. 1003 (Bryson Decl.), at ¶ 344. The nailing zone is also defined by the “nail openings” 47 in Fig. 8. *Id.* Venrick 1939 therefore discloses the basic asphalt shingle described in the preamble and elements (a)-(d) of claim 1. *Id.* at ¶¶ 341–343.

Venrick 1939 (Ex. 1013) also discloses elements (e) and (f), *i.e.*, the “reinforcement second thickness layer.” Specifically, Venrick 1939 discloses a “reinforcing strip” for, among other things, “strengthening the upper ends of the openings between the tabs to reduce the tendency of the shingle to tear” and to

“provide a reinforced area for nailing the shingle to the roof.” *Id.* at 3, col. 1:40–46; Ex. 1003 (Bryson Decl.), at ¶ 340.

The strip disclosed in Venrick 1939 is “at least partially externally visible.”

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 '228 patent at, for example, Fig. 2, except that, in the '228 patent, the strip is on the rear. Ex. 1003 (Bryson Decl.), at ¶ 348.

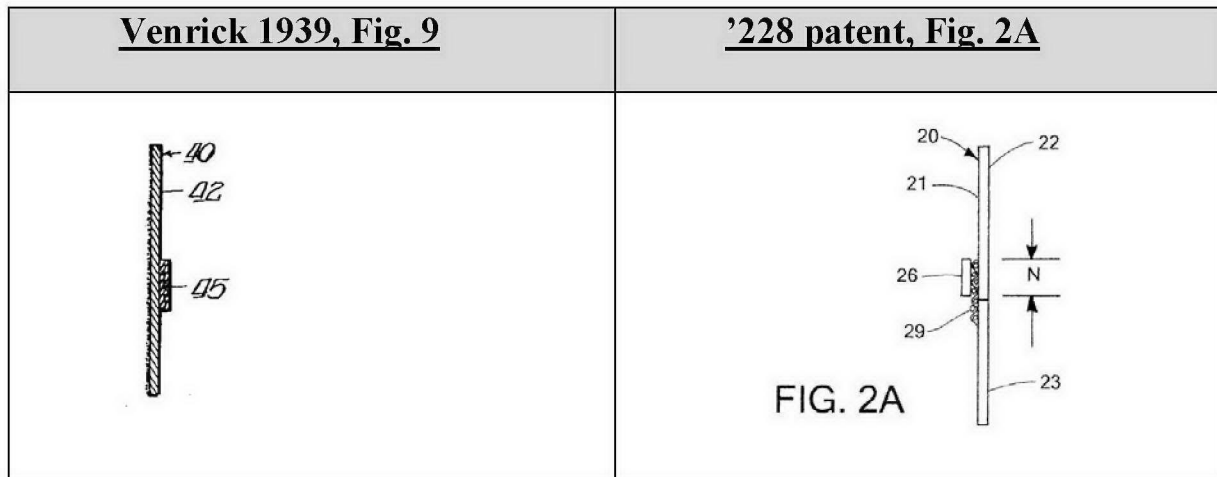


The reinforcing strip in Venrick 1939 (Ex. 1013) can be on the rear surface of the shingle. See Ex. 1013 (Venrick 1939), at Figs. 8–12; Ex. 1003 (Bryson Decl.), at ¶ 349. Venrick 1939 states: “in Figures 8, 10, and 12 the raised median strip is located on the undersurface of the shingle.” *Id.*; Ex.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

As shown in Figs. 8–12 of Venrick 1939 (Ex. 1013), the reinforcing strip forms a second thickness layer that is at least partially externally visible, is generally longitudinal in orientation, and extends between the right and left edges.

*See also id.* at 5, col. 1:26–27 (“said strip extends longitudinally of the shingle and accordingly reinforces and strengthens.”); 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 have been understood to have a thickness that is thinner than the thickness of the asphalt and granule covered mat. Ex. 1003 (Bryson Decl.), at ¶ 354. Roofing tape was also understood to have a thickness that is generally much thinner than the thickness of the asphalt and granule covered mat. *Id.* at ¶ 355. 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 ’228 patent. Ex. 1003 (Bryson Decl.), at ¶ 356.



Venrick 1939 (Ex. 1013) also specifically contemplates that the reinforcing strip is applied to the 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 exterior surface of the layer made of the base mat and asphalt/granule coatings. Ex. 1003 (Bryson Decl.), at ¶ 359.

Element (f) specifies that the reinforcement layer extend “across a lower end of the headlap portion” and that it “comprises a material selected from the group consisting of woven or nonwoven” thin fabric, plastic film, paper, parchment, foil and scrim. Ex. 1035 (’228 patent), at col. 7:9–17. As shown above in Fig. 1 of Venrick 1939, the reinforcing strip in Venrick 1939 extends across a lower end of the headlap portion. *See also* Ex. 1013 (Venrick 1939), at Figs. 2, 8, and 9. Venrick 1939 (Ex. 1013) also discloses a reinforcement layer that is made of roofing tape, which was understood to be made of, among other things, paper. Ex. 1003 (Bryson Decl.), at ¶¶ 353–355. Venrick anticipates claim 1. *Id.* at ¶ 504.

## **2. Venrick 1939 Anticipates Claim 13**

Claim 13 is directed to a roof having the shingle of claim 1 fastened thereto, except that the preamble of claim 13 does not require an upper headlap portion and a lower tab portion and element (f) requires the reinforcement layer extend “at least partially into the fastening zone” rather than “across a lower end of a headlap

portion.” As discussed *supra* § III.A.2 and in the discussion of claim 1, Venrick 1939 discloses a reinforcement layer that extends at least partially into the nailing zone. Venrick 1939 also states that the “shingles are nailed preferably . . . where the raised median strip is.” *Id.* at 5, col.1:51–53. Placing shingles on a roof is also disclosed in Venrick 1939. *Id.* at 3, col. 2:9–11 (stating that the shingles are “on a roof”); Ex. 1003 (Bryson Decl.), at ¶ 360. Venrick 1939 anticipates claim 13.

### **3. Venrick 1939 Anticipates Claim 19**

Claim 19 is directed to a method of making a shingle that is identical to the shingle described in claim 1. Ex. 1003 (Bryson Decl.), at ¶ 530. For the same reasons it anticipates claim 1, Venrick 1939 anticipates claim 19. *Id.*

### **4. Venrick 1939 Anticipates Claims 2, 14, and 20**

Claims 2, 14, and 20 depend on claims 1, 13, and 19, respectively, and require that the reinforcement layer be “adhered to the rear surface of the shingle.” As discussed above at § III.A.2., Venrick 1939 discloses a reinforcement layer that is adhered to the rear surface of the shingle, *i.e.*, “the first thickness layer.” Ex. 1003 (Bryson Decl.), at ¶ 93, 349. Venrick 1939 anticipates claims 2, 14, and 20. *Id.* at ¶¶ 505, 524, 531.

### **5. Venrick 1939 Anticipates Claims 3, 15 and 21**

Claims 3, 15, and 21 are dependent on claims 1, 13, and 19, respectively, and specify that “fasteners applied through the fastening zone will pass through the reinforcement layer.” Claim 21 adds the further limitation that the fastening zone

extends across the lower end of the headlap portion. Venrick 1939, including Figs. 8 and 9, discloses a reinforcement layer that at least partially extends into the longitudinal nailing zone of the shingle, located across the lower end of the headlap portion. *Id.* at ¶ 348–352. Nails applied through the fastening zone would therefore necessarily pass through the reinforcement layer. *Id.* at ¶¶ 506, 532. Indeed, Venrick 1939 (Ex. 1013) states that the “shingles are nailed preferably ... where the raised median strip is [located].” *Id.* at 5, col. 1:51–56. Venrick 1939 therefore anticipates claims 3, 15, and 21. Ex. 1003 (Bryson Decl.), at ¶¶ 506, 525, 532.

#### **6. Venrick 1939 Renders Obvious Claims 4, 16, and 22**

Venrick 1939 discloses all the limitations of claims 1, 13, and 19. Claims 4, 16 and 22 depend from those claims, respectively, and specify that the reinforcement layer “comprises a woven material.” Venrick 1939 discloses a reinforcement layer that is made of roofing tape, which was understood to be made of fibrous material. *Id.* at ¶ 507. A person of ordinary skill knew that other fibrous material could be used in place of roofing tape, that this material could comprise woven or non-woven material, and that the use of either was little more than a basic design choice. *Id.* at ¶ 507. Venrick 1939 renders obvious claims 4, 16, and 22. *Id.* at ¶¶ 507, 526, 533.

**7. Venrick 1939 Renders Obvious Claims 5 and 17**

Claims 5 and 17, which are dependent on claims 4 and 16, respectively, require a shingle “wherein fasteners applied through the fastening zone will pass through the fabric.” Claim 5 and 17 essentially cover the same subject matter as claims 3 and 15, respectively, except that these claims specify that the fasteners will pass through fabric. *Id.* at ¶¶ 509, 527. Venrick 1939 therefore renders obvious claims 5 and 17. *Id.*

**8. Venrick 1939 Renders Obvious Claims 6 and 7**

Claim 6 and 7 are dependent on claim 1. Claim 6 requires “a weight per square of at least about 235 lb” and claim 7 requires the weight be “selected from the group consisting of about 235 lb and about 250 lb.” Typical shingle weights were known to be between 200 and 300 lb per square and such ranges were reported in the literature. *See* Ex. 1009 (ARMA Manual 1997), at Table 1; Ex. 1043 (Consumer Reports, “Shingles and Siding”), at 3 (Aug. 1997); Ex. 1005 (Cash 1995), at 4; Ex. 1003 (Bryson Decl.), at ¶ 511. Venrick 1939 renders obvious claims 6 and 7. Ex. 1003 (Bryson Decl.), at ¶¶ 512, 513.

**9. Venrick 1939 Renders Obvious Claim 8**

Claim 8 is dependent on claim 1 and requires “resistance to nail pull of at least about 33 lb.” The ASTM standard in 2002 required a minimum nail pull through of 20-23 lbs for strip shingles and 30–40 lbs for laminated shingles, depending on the temperature. Ex. 1044 (“ASTM D 3462-02”) (March 2002), at

Table 1; Ex. 1003 (Bryson Decl.), at ¶ 515. It would have been obvious to a person of ordinary skill that a shingle with *increased* nail holding ability would demonstrate nail pull through resistance in excess of the ASTM minimums, such as at least 33 lbs. *Id.* at ¶ 516. Therefore, Venrick 1939 renders obvious claim 8.

#### **10. Venrick 1939 Renders Obvious Claim 9**

Claim 9 is dependent on claim 1 and discloses “a laminated shingle comprising upper and lower layers.” It was well known at the time of the invention that shingles could be laminated, *i.e.*, two layers of the basic shingle material could be adhered together to create a laminated shingle, and the ’228 patent cites, as exemplary prior art, Malarkey 2000 (Ex. 1011), which describes standard laminated shingles. *See* Ex. 1005 (Cash 1995), at Fig. 12; Ex. 1003 (Bryson Decl.), at ¶ 51–52, 518. The person of ordinary skill would have been motivated to utilize the reinforcing layer disclosed in Venrick 1939 with all of the most common types of shingles such as laminated shingles in order to achieve the benefits disclosed in Venrick 1939 and would have found such a modification to be an obvious design choice given the popularity of laminated shingles. *Id.* at ¶ 519. Thus, Venrick 1939 renders claim 9 obvious.

#### **11. Venrick 1939 Renders Obvious Claim 10**

Claim 10 is dependent on claim 9 and states “the upper layer includes one or more cutouts which form a plurality of tabs.” This claim covers nothing more than

well known and conventional features of a laminated shingle. 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. Ex. 1003 (Bryson Decl.), at ¶ 520. Not only are shingles with the described characteristics shown in Figs. 1, 2, 6, 8, and 10 of Venrick 1939 (Ex. 1013), a shingle having the described features is also shown in Fig. 1 of the '228 patent, which the patent describes as “prior art.” Ex. 1035 ('228 patent), at col. 3:3–6. Venrick 1939 renders obvious claim 10.

## **12. Venrick 1939 Renders Obvious Claim 11**

Claim 11 is dependent on claim 9 and states “fasteners applied through the fastening zone will pass through the reinforcement layer.” Claim 11 is identical to claim 3 except that it involves a laminated shingle. Ex. 1003 (Bryson Decl.), at ¶ 521. As discussed, Venrick 1939 discloses a reinforcement layer that at least partially extends into the longitudinal nailing zone of the shingle. *Id.* Nails applied through the fastening zone would therefore necessarily pass through the reinforcement layer. *Id.* In fact, 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 [located].” Ex. 1013 (Venrick 1939), at 5, col. 1:51–56. Indeed, the reinforcing benefits of nailing through multiple layers was well known as discussed above at § III.A.4, citing Malarkey

2000 (Ex. 1011), at col. 1:54–62 (“nailing through a double layer of material provides strength”). Venrick 1939 therefore renders obvious claim 11.

**13. Venrick 1939 Renders Obvious Claim 12**

Claim 12 is dependent on claim 9 and states that “fasteners applied through the fastening zone will pass through the upper and lower layers.” As discussed in claim 11, nailing through multiple layers is disclosed in Venrick 1939 and was also well known. *See also supra* at § IV.A.12. Thus, this claim is obvious.

**14. Venrick 1939 Renders Obvious Claim 18**

Claim 18 is dependent on claim 13 and describes the roof of claim 13 with a laminated shingle “comprising an upper layer and lower layer, the upper layer including one or more cutouts which form a plurality of tabs, and whereby fasteners applied through the fastening zone will pass through the reinforcement layer” and both layers of the laminated shingle. Claim 18 essentially combines the obvious subject matter of claims 9, 10 and 11 and applies the shingle to a roof. Venrick 1939 renders obvious this claim.

**B. Claims 1–22 Are Unpatentable Over Venrick 1939 in View of Frankoski 1998**

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 '228 patent refers to the shingles in Frankoski 1998 as the “basic” “prior art” shingle and incorporates by reference the disclosure of Frankoski 1998. Ex. 1035 ('228

patent), at col. 3:3–6.

**1. Venrick 1939 in View of Frankoski 1998 Renders Obvious Claim 1**

Like Venrick 1939, Frankoski 1998 discloses the “basic” “prior art” asphalt shingle, which the ’228 patent acknowledges meets all the limitations of the preamble of claim 1, as well as elements (a)-(c) of claim 1. Ex. 1003 (Bryson Decl.), at ¶ 535; Ex. 1035 (’228 patent), at col. 6:57–67.

Venrick 1939 and Frankoski 1998 also disclose element (d) of claim 1, which is another component of the basic prior art asphalt shingle. Venrick 1939 shows that the nailing zone (*i.e.*, fastening zone) is between the right and left edges of the shingle and generally intermediate of the upper and lower edges. *See supra*, at § III.A.2. The nailing zone in Frankoski 1998 (Ex. 1010) is shown as 20 in Fig. 1 and it is located between the right and left edges of the shingle and generally intermediate of the upper and lower edges. Ex. 1003 (Bryson Decl.), at ¶¶ 370, 541.

Venrick 1939 in view of Frankoski 1998 renders obvious elements (e) and (f) of claim 1. Frankoski 1998 discloses a scrim layer 60 that reinforces the asphalt shingle. Scrim is the preferred reinforcing material in the ’228 patent. Ex. 1035 (’228 patent), at col. 3:18–60.

Venrick 1939 (Ex. 1013) discloses a reinforcing layer that extends across the lower headlap region as shown for example by Figs. 1, 2, 6, 8-12 and states that



the reinforcing layer can be made of “felt, or metal ...or layers of roofing tape suitably bonded together.” *Id.* at 4, col. 2:73–5, col. 1:1; Ex. 1003 (Bryson Decl.), at ¶ 543. Given that the purpose of the scrim layer in Frankoski 1998 is reinforcement, it would have been obvious to modify the asphalt shingle disclosed in Venrick 1939 with the scrim material disclosed in Frankoski 1998. Ex. 1003 (Bryson Decl.), at ¶ 543. Frankoski 1998 expressly contemplates that the scrim layer can be positioned in any number of locations within the shingle. Ex. 1003 (Bryson Decl.), at ¶ 544; Ex. 1010 at col. 3:39–45.

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 scrim material disclosed in Frankoski 1998 is lighter and just as strong (if not stronger) than the materials disclosed in Venrick 1939. *Id.* at ¶ 545. *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 adaption” is obvious).

The person of ordinary skill would have recognized that the scrim material disclosed in Frankoski 1998 would be much thinner than the asphalt and granule coated mat material comprising the shingle. Ex. 1003 (Bryson Decl.), at ¶ 546. As in Venrick 1939 and other prior art (*e.g.*, 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 an externally visible second thickness layer. *Id.* To accomplish this, the person of ordinary skill would also understand that the scrim material could be adhered using, for example, a cement, as disclosed in Venrick 1939. *Id.*; Ex. 1013, at 4, col.1:32–37.

It would have been reasonably expected the thin scrim material in Frankoski 1998 would function as reinforcing material because data in Frankoski 1998 shows that the scrim improved the strength of the asphalt shingle and other prior art such as Venrick 1939 and Olszyk 1974 showed that thin material could be used as reinforcement material for asphalt shingles, and that the reinforcing material could be affixed to the rear surface of the shingle. *Id.* at ¶ 547.

Both Venrick 1939 and Frankoski 1998 disclose element (f). As discussed above at § III.A.2–4, Venrick 1939 discloses a paper roofing tape and Frankoski discloses a scrim layer 60 that reinforces the asphalt shingle. *Id.* at ¶ 543.

Venrick 1939 in view of Frankoski 1998 renders obvious claim 1.

## **2. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 13**

Claim 13 discloses a roof having the shingles disclosed in claim 1 fastened thereto, except that it removes the discussion of a headlap and lower tab portion and requires the reinforcement layer extend “at least partially into the fastening

zone” rather than “across a lower end of a headlap portion.” As discussed *supra* at § III.A.2 and § IV.A.2, Venrick 1939 discloses this limitation. Frankoski 1998 (Ex. 1010) also states that the scrim will “coincide with at least a portion of the nail zone for the shingle.” *Id.* at col. 5:29–42. Fastening shingles to a roof is obvious and both Venrick 1939 and Frankoski 1998 explicitly disclose this. Ex. 1003 (Bryson Decl.), at ¶ 568. Indeed, Figure 2 of Venrick 1939 depicts the disclosed shingles fastened to a roof. *See also* Ex. 1013 (Venrick 1939), at p.1 col. 2:9–11. And, Frankoski 1998 teaches a method for fastening shingles to a roof. Ex. 1010 (Frankoski 1998), at col. 10:17–19. Venrick 1939 in view of Frankoski 1998 renders obvious claim 13.

**3. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 19**

Claim 19 claims a method of making a shingle identical to that described in claim 1. Ex. 1003 (Bryson Decl.), at ¶ 575. Claim 19 is obvious.

**4. Venrick 1939 in View of Frankoski 1998 Renders Obvious Claims 2, 14 and 20**

Claims 2, 14, and 20 depend on claims 1, 13, and 19, respectively, and require that the reinforcement layer be “adhered to the rear surface of the shingle.” As discussed above at § III.A.2, Venrick 1939 discloses a reinforcement layer that is adhered to the rear surface of the shingle, *i.e.*, the first thickness layer. Venrick 1939 in view of Frankoski 1998 render obvious claims 2, 14, and 20. *Id.* at ¶¶ 549,

570, 576.

**5. Venrick 1939 in View of Frankoski 1998 Renders Obvious Claims 3, 15 and 21**

Claims 3, 15, and 21 are dependent on claims 1, 13, and 19, respectively, and specify that “fasteners applied through the fastening zone will pass through the reinforcement layer.” Claim 21 adds the further limitation that the fastening zone extend across the lower end of the headlap portion. As discussed, Venrick 1939 discloses a reinforcement layer that at least partially overlaps with the longitudinal nailing zone of the shingle and is located in the lower end of the headlap portion. *See supra*, at § III.A.2. Nails applied through the fastening zone would therefore necessarily pass through the reinforcement layer and Venrick 1939 explicitly contemplates this configuration. Ex. 1003 (Bryson Decl.), at ¶ 550. Frankoski 1998 also states that the scrim will “coincide with at least a portion of the nail zone for the shingle . . . to provide added strength.” Ex. 1010 (Frankoski 1998), at col. 5:29–42. Venrick 1939 in view of Frankoski 1998 renders obvious claims 3, 15, and 19. Ex. 1003 (Bryson Decl.), at ¶ 550, 571, 575.

**6. Venrick 1939 in View of Frankoski 1998 Renders Obvious Claims 4, 16, and 22**

Claims 4, 16, and 22, which are dependent on claims 1, 13, and 19, respectively, specify that the reinforcement layer “comprises a woven material.” Frankoski 1998 repeatedly discloses that the scrim used for the reinforcement layer

may be woven. *E.g.*, Ex. 1010 (Frankoski 1998), at Abstract, col. 5:10–11, col. 5:47; Ex. 1003 (Bryson Decl.), at ¶ 551. In fact, claim 3 of Frankoski 1998 provides a “scrim comprising a layer of woven fiberglass strands.” *Id.* Venrick 1939 in view of Frankoski 1998 renders obvious claims 4, 16, and 22. *Id.* at ¶¶ 551, 572, 578.

**7. Venrick 1939 in View of Frankoski 1998 Renders Obvious Claims 5 and 17**

Claims 5 and 17, which are dependent on claims 4 and 16, require a shingle “wherein fasteners applied through the fastening zone will pass through the fabric.” Claim 5 and 17 essentially cover the same obvious subject matter as claims 3 and 15, respectively, except that these claims specify that the fasteners will pass through fabric. Venrick 1939 in view of Frankoski 1998 renders obvious claims 5 and 17. *Id.* at ¶¶ 552, 573.

**8. Venrick 1939 in View of Frankoski 1998 Renders Obvious Claims 6 and 7**

As discussed *supra* at § IV.A.8, the weight ranges covered by these claims cover nothing more than standard weight ranges known in the art. Therefore, Venrick 1939 in view of Frankoski 1998 renders obvious claims 6 and 7.

**9. Venrick 1939 in View of Frankoski 1998 Renders Obvious Claim 8**

Venrick 1939 and Frankoski 1998 both teach shingles with improved nail pull. *See supra*, at § IV.A.9. Frankoski 1998 reports testing results demonstrating

nail pull resistance ranging from 57–100.1 lb. Ex. 1010 (Frankoski 1998), at col. 6:15–col. 7:28. It would have been obvious to a person of ordinary skill that the shingle taught in Venrick 1939, modified to include the reinforcement layer disclosed in Frankoski 1998, would generate the same or similar ranges of nail pull resistance. Ex. 1003 (Bryson Decl.), at ¶ 558. Venrick 1939 in view of Frankoski 1998 renders claim 8 obvious.

**10. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 9**

As discussed, laminated shingles were one of the three most common shingles at the time of the invention and their benefits were widely appreciated by those of ordinary skill, *supra* § III.A.4. Frankoski 1998 also explicitly teaches a laminated shingle with a lower layer underlying the upper layer. *See id.* As discussed above at § IV.B.1, the person of ordinary skill would have been motivated to utilize the reinforcing layer disclosed in Venrick 1939 and Frankoski 1998 with all of the most common types of shingles such as laminated shingles in order to achieve the benefits disclosed in Venrick 1939 and Frankoski 1998 and would have found such a modification to be an obvious design choice given the popularity of laminated shingles. *Id.* at ¶ 560. Venrick 1939 in view of Frankoski 1998 renders obvious claim 9.

**11. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 10**

Claim 10 covers nothing more than conventional features of a laminated shingle. *See* Ex. 1005 (Cash 1995), at Fig. 10; Ex. 1009 (ARMA Manual 1997), at 11–14, Table 1; Ex. 1003 (Bryson Decl.), at ¶ 561. Similarly, Frankoski 1998, in describing Figure 1, explains “[t]he exposed face area 25 includes the portion of upper layer 5 including one or more cutouts which for a plurality of tabs...” Ex. 1010 (Frankoski 1998), at col. 4:28–32; *see also* Fig. 3. The figures of Venrick 1939 (Ex. 1013) show shingles having these features and the ’228 patent, in Fig. 1, refers to a shingle having these features as “prior art.” Ex. 1035 (’228 patent), at Fig. 1, col. 3:3–6. Venrick 1939 and Frankoski 1998 render obvious claim 10.

**12. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 11**

Claim 11 is identical to claim 3, except that the shingle is laminated. The concept of nailing the shingle through the reinforced layers was known and obvious for laminated shingles, *see supra* at § III.A.4, and Frankoski 1998 and Venrick 1998 both explicitly teach that the nail zone coincides with the reinforcing layer to improve strength and performance. *E.g.*, Ex. 1010 (Frankoski 1998), at col. 5:29–42; Ex. 1003 (Bryson Decl.), at ¶ 563. Venrick 1939 in view of Frankoski 1998 renders obvious claim 11.

**13. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 12**

Claim 12 is dependent on claim 9 and states that “fasteners applied through the fastening zone will pass through the upper and lower layers.” This claim is obvious for the same reasons claim 11 is obvious. *Id.* at ¶ 564.

**14. Venrick 1939 In View Of Frankoski 1998 Renders Obvious Claim 18**

Claim 18 essentially combines the obvious subject matter of claims 9, 10, and 11 and is obvious for the same reasons these claims are obvious. *Id.* at ¶ 574.

**C. Claims 1–22 Are Unpatentable Over Venrick 1939 in View of Kiik 2001**

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**

As discussed above, Venrick 1939 discloses the basic asphalt shingle. Ex. 1003 (Bryson Decl.), at ¶ 341–43. Kiik 2001 also discloses the basic asphalt shingle. *Id.* at ¶ 403. Venrick 1939 and Kiik 2001 therefore each disclose elements (a)-(d) of claim 1. *Id.* at ¶ 580.

As discussed *supra*, at III.A.3, Kiik 2001 (Ex. 1018) discloses a “backing material” 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 ¶ 582.

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. Ex. 1003 (Bryson Decl.), at ¶ 583. The nail pull data in Kiik 2001 confirms this. *Id.*

Venrick 1939, like other prior art such as Rohner 1989 and Sieling 1999, discloses an externally visible reinforcing layer that is adhered to the rear exterior surface of the shingle as a second thickness layer. *See supra* at § III.A.2; Ex. 1003 (Bryson Decl.), at ¶ 587. Given that the purpose of the backing material in Kiik 2001 is reinforcement, it would have been obvious to modify the asphalt shingle disclosed in Venrick 1939 by using the backing material disclosed in Kiik 2001.

As discussed, Venrick discloses reinforcement material made of, *inter alia*, paper roofing tape. *Id.* at ¶ 589. Kiik 2001’s “backing layer” is made of, among other things, polyester fibers, wool, nylon fibers, rayon fibers, acrylic fibers,

polyolefin fibers, polypropylene fibers and recycled plastics fibers. *Id.*; Ex. 1018 (Kiik 2001), at [0004], [0006]. Kiik 2001 specifically discloses a woven polyester mat as possible backing layer and other disclosed materials, including cotton, nylon, and wool fibers, as well as carpet materials, would have been understood to include a woven thin fabric. Ex. 1003 (Bryson Decl.), at ¶ 589. 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 materials disclosed in Kiik 2001 are lighter and just as strong (if not stronger) than the materials disclosed in Venrick 1939. *Id.* at ¶ 585.

The person of ordinary skill would recognize that the backing material disclosed in Kiik 2001 is much thinner than the asphalt and granule coated mat material that would make up the shingle. *Id.* at ¶ 586. In fact, the exemplified backing material in Kiik 2001, which was made of polyester fiber, had a thickness on the order of 1/1000<sup>th</sup> 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 ¶ 587. 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, disclosed in Venrick 1939. *Id.*

The person of ordinary skill would have reasonably understood the thin backing material of Kiik 2001 to function as reinforcing material given the data in the Kiik 2001 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 1998, which showed that thin material could be used as reinforcement material for asphalt shingles. *Id.* at ¶ 588. Venrick 1939 in view of Kiik 2001 therefore renders obvious claim 1.

**2. Venrick 1939 In View of Kiik 2001 Renders Obvious Claim 13**

Claim 13 is directed to a roof having the shingle of claim 1 fastened thereto, except that the preamble of claim 13 does not require an upper headlap portion and a lower tab portion and element (f) requires the reinforcement layer extend “at least partially into the fastening zone” rather than “across a lower end of a headlap portion.” As discussed *supra* at § III.A.2, Venrick 1939 discloses this limitation. The nail pull data in Kiik 2001, discussed *infra* at § IV.C.9., also confirms the backing layer in the reference extended at least partially into the nail zone. And, such a configuration would be obvious for purposes of increasing nail pull strength, as described in Venrick 1939 and Kiik 2001. Ex. 1003 (Bryson Decl.), at

¶ 609. As discussed *supra* at § IV.A.2., attaching a shingle to a roof is obvious.

*Id.* at ¶ 610. Venrick 1939 in view of Kiik 2001 renders obvious claim 13.

**3. Venrick 1939 In View of Kiik 2001 Renders Obvious Claim 19**

Claim 19 claims a method of making a shingle identical to that described in claim 1. Venrick 1939 and Kiik 2001 render obvious claim 19. *Id.* at ¶ 617.

**4. Venrick 1939 in View of Kiik 2001 Renders Obvious Claims 2, 14, and 20**

Claims 2, 14, and 20 dependent on claims 1, 13, and 19, respectively, and require that the reinforcement layer be “adhered to the rear surface of the shingle.” As discussed *supra* at § III.A.2, Venrick 1939 discloses a reinforcement layer that is adhered to the rear surface of the shingle. Kiik 2001 also discloses a reinforcement layer affixed the rear. *Id.* at ¶¶ 405, 591; Ex. 1018 (Kiik 2001), at [0004], [0007]. Venrick 1939 in view of Kiik 2001 renders obvious claims 2, 14, and 20. *Id.* at ¶¶ 519, 612, 618.

**5. Venrick 1939 in View of Kiik 2001 Renders Obvious Claims 3, 15 and 21**

Claims 3, 15, and 21 which are dependent on claims 1, 13, and 19, respectively, specify that “fasteners applied through the fastening zone will pass through the reinforcement layer.” Claim 21 adds the further limitation that the fastening zone extend across the lower end of the headlap portion. *Id.* at ¶ 619. As discussed, Venrick 1939 discloses a reinforcement layer that at least partially

overlaps with the longitudinal nailing zone of the shingle and is located in the lower end of the headlap portion. *See supra*, at § III.A.2. Kiik also explains that shingles with the backing layer “demonstrate increased nail holding ability.” Ex. 1018 (Kiik 2001), at [0009]. Thus, Kiik 2001 necessarily discloses this limitation. Ex. 1003 (Bryson Decl.), at ¶ 592. Such a configuration would be obvious if one of the purposes of the reinforcing layer is increasing nail pull strength, as described in both Venrick 1939 and Kiik 2001. *Id.* Venrick 1939 and Kiik 2001 render obvious claims 3 and 15. *Id.* at ¶¶ 592, 613, 619.

**6. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claims 4, 16, and 22**

Claims 4, 16, and 22, which are dependent on claims 1, 13, and 19, respectively, specify that the reinforcement layer “comprises a woven material.” Kiik 2001 discloses, *inter alia*, polyester fibers, cotton fibers, wool fibers, and carpet material, which a person of ordinary skill would know could be woven or nonwoven. Ex. 1018 (Kiik 2001), at [0004], [0006]; Ex. 1003 (Bryson Decl.), at ¶ 593. Choosing between the two would have been considered nothing more than an obvious design choice. Ex. 1003 (Bryson Decl.), at ¶ 593. In fact, one of the backing materials in Kiik is a woven polyester mat. *Id.*; Ex. 1018 (Kiik 2001), at [0006]. Venrick 1939 in view of Kiik 2001 renders obvious these claims. *Id.* at ¶¶ 593, 614, 620.

**7. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claims 5 and 17**

Claims 5 and 17, which are dependent on claims 4 and 16, require a shingle “wherein fasteners applied through the fastening zone will pass through the fabric.” Claim 5 and 17 basically cover the same subject matter as claims 3 and 15, respectively, except that these claims specify that the fasteners will pass through fabric. For the same reasons that Venrick 1939 and Kiik 2001 render claims 4 and 16 obvious, these references also render obvious claims 5 and 17. *Id.* at ¶¶ 594, 615.

**8. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claims 6 and 7**

As discussed *supra* at § IV.A.8, the weight ranges covered by these claims cover nothing more than standard weight ranges known in the art. Venrick 1939 in view of Kiik 2001 renders obvious claims 6 and 7. *Id.* at ¶¶ 595–97.

**9. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claim 8**

Claim 8 requires the shingle have “resistance to nail pull of at least about 33 lb.” Venrick 1939 and Kiik 2001 both teach shingles with improved nail pull. *Id.* at ¶ 599. Kiik 2001 reports an increase of 2.14 and 2.60 times the nail pull strength of a standard laminated shingle. *Id.* Standards at the time of Kiik 2001 required a minimum nail pull resistance of 30-40 lb for laminated shingles. *Id.*; Ex. 1044 (ASTM D 3462-02 Standard), at Table 1. Thus, Kiik 2001 discloses nail pull

strengths in the range of 64.2 to 104 lb/square. Ex. 1003 (Bryson Decl.), at ¶ 599.

Venrick 1939 and Kiik 2001 render obvious claim 8.

**10. Venrick 1939 In View Of Kiik 2001 Renders Obvious Claim 9**

Claim 9 discloses “a laminated shingle comprising upper and lower layers.” Laminated shingles were one of the three most common shingles at the time of the invention and their benefits were widely known, *supra* § III.A.4. *Id.* at ¶ 601. Kiik 2001 also states “[s]ometimes one or more fibrous sheets are laminated with one or more bituminous layers.” Ex. 1018 (Kiik 2001), at [0005]. In fact, the test samples used in Kiik 2001 applied the disclosed backing material on a “standard laminated shingle product sold by Elk.” *Id.* at [0014]. The person of ordinary skill would have been motivated to utilize the reinforcing layer disclosed in Venrick 1939 and Kiik 2001 with all of the most common types of shingles such as laminated shingles in order to achieve the benefits disclosed in Venrick 1939 and Kiik 2001 and would have found such a modification to be an obvious design choice given the popularity of laminated shingles. Ex. 1003 (Bryson Decl.), at ¶ 602. Venrick 1939 in view of Kiik 2001 renders obvious claim 9.

**11. Venrick 1939 In View of Kiik 2001 Renders Obvious Claim 10**

Claim 10 covers nothing more than conventional features of a laminated shingle. *See* Ex. 1005 (Cash 1995), at Fig. 10; Ex. 1009 (ARMA Manual 1997), at

11–14, Table 1; Ex. 1003 (Bryson Decl.), at ¶ 604. The figures of Venrick 1939 (Ex. 1013) show shingles having these features and the '228 patent, in Fig. 1, refers to a shingle having these features as “prior art.” Ex. 1035 ('228 patent), at Fig. 1, col. 3:3–6. Kiik 2001 also explains its backing layer “may be applied to any design or formulation of roofing material” which would include a laminated shingle where the upper layer contains a plurality of tabs. Ex. 1018 (Kiik 2001), at [0010]. Venrick 1939 in view of Kiik 2001 renders claim 10 obvious.

**12. Venrick 1939 In View of Kiik 2001 Renders Obvious Claim 11**

Claim 11 is identical to claim 3, except that the shingle is laminated. The concept of nailing the shingle through the reinforced layers was also known and obvious for laminated shingle. *Supra*, at § III.A.4; Ex. 1003 (Bryson Decl.), at ¶ 606. Kiik 2001 also explains that shingles with the laminated shingle with the backing layer “demonstrate increased nail holding ability.” Ex. 1018 (Kiik 2001), at [0009]. Thus, Kiik 2001 necessarily discloses this limitation. Venrick 1939 in view of Kiik 2001 renders obvious claim 11.

**13. Venrick 1939 In View of Kiik 2001 Renders Obvious Claim 12**

Claim 12 is dependent on claim 9 and states that “fasteners applied through the fastening zone will pass through the upper and lower layers.” This claim is obvious for the same reasons claim 11 is obvious. *Supra* § IV.C.12.



**14. Venrick 1939 In View of Kiik 2001 Renders Obvious Claim 18**

Claim 18 essentially combines the obvious subject matter of claims 9, 10, and 11 and are obvious for the same reasons these claims are obvious. *Id.* at ¶ 616.

**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 bear on the question of the obviousness of the claims of the '228 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 '228 patent because the products fall outside the scope of the claims. Ex. 1003 (Bryson Decl.), at ¶ 948. For example, 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 being attached to the "first thickness layer." *Id.* at ¶ 949.

Even if Petitioner's products were covered by the claims of the '228 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, for this reason, and the additional reasons explained above, any commercial success enjoyed by Petitioner's products are not relevant to the nonobviousness of the claims of the '046 patent. *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.").

## V. CONCLUSION

For the foregoing reasons, the Petitioner respectfully requests that Trial be instituted and that claims 1–22 of the '228 patent be canceled.

Dated: August 29, 2014

Respectfully Submitted,

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**PETITION FOR INTER PARTES REVIEW**  
**OF U.S. PATENT NO. 7,781,046**

**Attachment A:**  
**Proof of Service of the Petition**

**CERTIFICATE OF SERVICE**

I hereby certify that on this 29<sup>th</sup> day of August 2014, a copy of this  
PETITION FOR INTER PARTIES REVIEW has been served in its entirety by  
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**PETITION FOR INTER PARTES REVIEW**

**OF U.S. PATENT NO. 7,781,046**

**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 <sup>th</sup> 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 <sup>th</sup> 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.)