

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

POSCO

Petitioner,

v.

ARCELORMITTAL

Patent Owner.

Case IPR2019-01275

Patent 9,708,683

PATENT OWNER'S SUR-REPLY TO
PETITIONER'S RESPONSE

TABLE OF CONTENTS

I. INTRODUCTION	1
II. CLAIM CONSTRUCTION.....	3
A. Patentee's Construction is Supported By the Intrinsic Record	3
1. The Claims Support Patentee's Construction.....	4
2. The Specification Supports Patentee's Construction	5
3. The Prosecution History Supports Patentee.....	7
4. Spreading Order Or Contact With Base Steel Is Not Required.....	7
B. Petitioner's Construction Conflicts With The Intrinsic Record	8
1. Prior Art Figure 2 Of The '683 Patent Identifies One Intermetallic Layer At Two Locations	8
2. The Layer Names Are Not What Specifies Position	9
C. Petitioner Passes On Providing A Construction For The Term Layer	9
D. The Preamble Is A Limitation	10
III. CORNETTE FIGURE 22 IS NOT STAMPED.....	12
A. Heat Treatment In Cornette Does Not Include Or Mean Stamping.....	12

B.	Contrary To Petitioner's Allegation, The Reference To A Cataphoresis Layer In Vaissiere Figures 14 And 15 Does Not Mean The Specimen Is Stamped.....	15
C.	Contrary To Petitioner's Allegation, References To "Good Quenchability" In Vaissiere, Or "Stamping" In Cornette, Do Not Mean That Vaissiere Figure 15 And Cornette Figure 22 Are Stamped.....	16
IV.	CORNETTE'S FIGURE 22 AND VAISSIERE'S FIGURES 14 AND 15 WERE CREATED TO SHOW SURFACE ROUGHNESS ON THE TOP LAYER FOR PAINTING--NOT TO SHOW LAYERS	18
V.	CORNETTE DOES NOT HAVE THE CLAIMED FOUR LAYERS	18
VI.	PATENTEE'S DISCUSSION OF HEATING RATE IS IN RESPONSE TO PETITIONER'S ARGUMENTS	20
VII.	CLAIM 9.....	20
VIII.	CLAIM 11	24
IX.	CONCLUSION.....	28

TABLE OF AUTHORITIES

Cases

<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005)	passim
<i>Markman v. Westview Instruments</i> , 517 U.S. 370 (1996)	3
<i>Greenliant Sys., Inc. v. Xicor LLC</i> , 692 F.3d 1261 (Fed. Cir. 2012)	21
<i>KSR Int'l Co. v. Teleflex Inc.</i> , 127 S.Ct. 1727 (2007)	24
<i>Henny Penny Corporation v. Frymaster LLC</i> , 938 F.3d 1324 (Fed. Cir. 2019) ...	25

Regulations

37 C.F.R. § 42.23(b)	25
37 CFR § 42.65	27

I. INTRODUCTION

The Board invited the parties to brief the meaning of "layer" and in response Patentee submitted a proper construction based on a full *Phillips* analysis while Petitioner passed up the opportunity because if a proper *Phillips* analysis was provided their Petition would fail. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005)(en banc). Instead, Petitioner provided nothing more than four random ordinary dictionary definitions of "layer," without even addressing whether they are consistent with the intrinsic record. Reply 10. Petitioner's proposed definitions are exactly what *Phillips* forbids.

Petitioner provides constructions for each of the layer names based on their "positional requirements" which conflict with the intrinsic record and a proper *Phillips* analysis. Reply 4, 10, Institution Decision, 11. Petitioner's location-based constructions of the layer names are inconsistent with the '683 patent prior art Figure 2 which clearly identifies one Al-rich Intermetallic layer at two locations, indicating a "layer" is differentiated by materials not location. Petitioner completely fails to address Figure 2, while Patentee's construction gives it proper consideration. Further, dependent claim 2 expressly recites that "less than 10%" of layer (c) can be present at the top surface (i.e. 9% of layer (c) can be at the top surface) which would be impossible if layers (c) and (d) *could* be of the same

composition. There is no possible interpretation consistent with *Phillips* that would permit Petitioner's constructions of the four layers. Patentee's construction of "layer" should be accepted by the Board because it follows proper *Phillips* analysis and is consistent with the intrinsic record.

When the term "layer" is properly construed, it is clear that Cornette does not show the four layers of claim 1.

Further, notwithstanding Petitioner's obfuscations to the contrary, it is clear that Cornette Figure 22 is of a heat treated part, not a stamped part, and thus cannot show or teach the claimed ***stamped product*** with the specified four layers.

With respect to dependent claim 9, Petitioner relies on a cooling rate in Somani that begins during or after compression in the die, and is completely unrelated to any cooling in Cornette or to the claimed cooling rate, which is expressly defined as the "mean rate between the exit of the heated blank from the furnace, down to 400°C." '683 patent, 11:28-29.

With respect to claim 11, Petitioner completely fails to provide any rational reason to deviate from the clear teaching of Cornette that a 25µm thickness layer is "the best compromise between corrosion protection and weldability." Ex. 1013-0009.

II. CLAIM CONSTRUCTION

A. Patentee's Construction Is Supported By The Intrinsic Record

Patentee's construction of layer as "a material spread over the base steel different from other materials spread over the base steel" (Paper 18 ("POR"), 28-38) is consistent with the intrinsic record, and is the one that "comports with the instrument as a whole." *Markman v. Westview Instruments*, 517 U.S. 370, 389 (1996).

At page 4 of the Reply, Petitioner attempts to redefine Patentee's position as having "compositional requirements" for the layers, inferring specific composition. To the contrary, Patentee's construction rests on different materials, and not any specific compositional attributes. The term "layer" in combination with four different claimed layer names, when read in light of the specification and in particular Figure 1 with four layers and prior art Figure 2 without four layers, and claim 2 which precludes the possibility of layers (b) and (d) being of the same material, makes clear that "layer" means "a material spread over the base steel different from other materials spread over the base steel."

1. The Claims Support Patentee's Construction

Petitioner's contention (Reply, 4) that the claims do not specifically mention any compositional requirements fails to consider that claim 1 distinguishes each layer from the other by providing each of the four layers with different layer names. *Phillips*, 415 F.3d at 1314 ("the claims themselves provide substantial guidance as to the meaning of particular claim terms."). The four different names are not used any differently in the specification and are consistent with Patentee's construction of "layer."

While Petitioner asserts (Reply, 7) that because the patent refers to a layer "(a) [i]nterdiffusion layer or intermetallic layer" in one line that the patent does not assign any importance to the names of the layers, the *claims* state that layer (a) is an interdiffusion layer while layer (c) is an intermetallic layer, and Petitioner *itself* provides two different claim constructions for "interdiffusion" in layer (a) as compared with "intermetallic" in layer (c). Reply, 10.

Petitioner's allegation (Reply, 5) that had the Patentee wanted the layers to include "compositional–distinctness" they would have included such, rather than rely on a pending continuation application, is irrelevant and wrong. The patented claims require different materials by naming four successive different layers. Petitioner's reliance on the continuation application is also misplaced: the

continuation application is narrower by requiring different *iron or aluminum mean compositions* in the layers of different materials.

Finally, Petitioner argues (Reply, 5) that because there is "no requirement" of a "simultaneous presence of layers (c) and (d) at the extreme surfaces" that claim 2 is inconsistent with Patentee's construction. To the contrary, it is Petitioner's construction that is precluded by claim 2's recitation that "less than 10% of layer (c) is present at an extreme surface of the product." It is the *possibility* of the simultaneous presence of layers (c) and (d) at the extreme surfaces that *precludes* any construction of "layer" as merely defined by position as Petitioner alleges. Put simply, if "layer" is defined by position as urged by Petitioner, then there can *never* be less than 100% of layer (d) at the extreme surface because whatever is at the surface is by definition layer (d). For it to be *possible* for 9% of layer (c) to be present on the extreme surface along with layer (d), the materials *must* be different. Ex. 2010 ¶¶57-58.

2. The Specification Supports Patentee's Construction

Petitioner wrongly asserts (Reply, 5) that Patentee's construction "hinges" on reading mean composition from Example 2 into the claims. Patentee looks to the intrinsic record, including language of claim 1 reciting four layers with four different names, the language of claim 2 that *precludes the possibility of* layers (b)

and (d) being of the same material, Figure 2 which is expressly described in the specification as not having 4 layers, as well as Example 2 which describes the four layers as having different mean compositions, as supporting adoption of Patentee's construction of layer. POR, 28-38.

Petitioner argues (Reply, 6) that Example 2 is the only example that supports different materials, and should be discarded because Example 2 "falls outside the scope of the claims" because its layer (a) is 2 micrometers thicker than what is claimed. This is irrelevant. Patentee properly relies on Example 2 and Figures 1 and 2 for their description of what is meant by the four claimed layers, and considers that description in the context of the entire intrinsic record to show that "layer" requires different materials. The fact that Example 2 may differ from the claim in terms of the thickness of layer (a) does not detract from its relevance to the meaning of layer.

Petitioner argues (Reply, 6-7) that because the specification has "ranges for the intermediate layer and superficial layer that completely overlap," it therefore has two identical layers. However, Petitioner ignores that what is described there are *ranges* of individual elements Fe, Al, and Si that may be present throughout each layer. POR, 35-36. This was explained by the unrebutted testimony of Patentee's expert ("DeArdo") who testified under cross-examination that "each

layer is going to have its own composition." Ex.1052, 98:18-100:2, 101:21-25, 102:8-10.

3. The Prosecution History Supports Patentee

Contrary to Petitioner's argument (Reply, 8), the prosecution history is consistent with Patentee's construction of "layer." The Examiner's reliance on Figure 2A of Takagi includes a reprint in the Office Action showing a five-layer structure (Ex.1002, 141) which is described in Takagi as "a multi-layer structure such as a five-layer structure having five layers of different alloy compositions." Ex. 2002, [0024]. This provides further support for Patentee's construction.

4. Spreading Order Or Contact With Base Steel Is Not Required

Contrary to Petitioner's assertion (Reply, 8-9), there is nothing in Patentee's construction of "layer" that requires spreading of the materials in a sequential order, nor is there anything in the construction that limits the materials spread over the base steel to have direct contact with the base steel. First, "spread over" does not indicate a process, but rather indicates a structure relative to the base steel. Second, contrary to their allegation that "once the first material is spread over the base steel, the next material can no longer be spread over the base steel," a material can be spread out over the base steel without contact, just as a paint can be

spread out over a wall even if a primer layer is in between. Further, Petitioner's argument conflicts with their own proposed dictionary definition on page 10 of the Reply: "Ex.1053: defining 'layer' as a 'single thickness, coating, or stratum *spread out* or covering a surface.'" (Emphasis added).

B. Petitioner's Construction Conflicts With The Intrinsic Record

1. Prior Art Figure 2 Of The '683 Patent Identifies One Intermetallic Layer At Two Locations

Petitioner's location-based construction of "layer" (Reply, 4, Institution Decision, 11) is inconsistent with prior art Figure 2 where the inventors clearly identify one Al-rich Intermetallic layer at two locations within another, darker colored layer, and over a lighter "interdiffusion layer." If layers were defined merely by position as urged by Petitioner, then Figure 2 would have been labeled as having two Intermetallic layers, not one. The inventors clearly intended "layer" to mean "different from other materials" otherwise they would have labeled each Intermetallic location as separate layers, despite being the same material. POR, 26-28. *Phillips*, 415 F.3d at 1315, *quoting Markman*, 517 U.S. at 389 ("[A claim] term can be defined only in a way that comports with the instrument as a whole.").

Further, Petitioner's construction encompasses prior art Figure 2 which expressly "does not correspond to the invention." POR, 26-28. Petitioner completely fails to address Figure 2. Petitioner's location-based construction of "layer" would result in prior art Figure 2 having (at least) four layers and directly contradict the specification. POR, 26.

2. The Layer Names Are Not What Specifies Position

Petitioner argues that its position-based constructions should be accepted because "claim 1 specifies positional requirements for the four claimed layers" Reply, 4. Claim 1 *does* reference layer position, but not, as Petitioner asserts, in the meaning of the layer terms. Rather, the *locations* of the layers are specified with the phrase "proceeding from the base steel outwards" as Petitioner's own expert ("Miles") acknowledged under cross examination. Ex. 2011, 92:6-15.

C. Petitioner Passes On Providing A Construction For The Term Layer

Petitioner's dictionary definitions of "layer" (Reply, 10) are not even claim constructions. Petitioner fails to provide any *Phillips* analysis for these definitions leaving it up to the Board to determine if they are consistent or inconsistent with the intrinsic record. This is Petitioner's burden. Relying on naked dictionary definitions as the Petitioner has done is contrary to *Phillips* and should be rejected.

Phillips, 415 F.3d at 1319-1321. Moreover, Patentee has provided a dictionary definition that is completely consistent with its construction. Ex. 2008, p.409, POR, 31.

D. The Preamble Is A Limitation

Petitioner's focus (Reply, 2) on the preamble not providing "antecedent basis for the body of the claim" and not being discussed during prosecution improperly ignores the repeated use and noteworthy importance of a stamped product throughout the patent specification. The modifier "stamped" in "stamped product" imparts a structural feature to the term product and gives life to the claim by telling the reader what it is: not any product, but a stamped product, and a stamped product is structurally different from unstamped product. The '683 patent emphasizes the importance of the claimed product being a "stamped product" in the objects of the invention, preferred embodiments and figures, and by describing stamping in numerous examples. POR, 39-46. It is evident that the term "coated steel stamped product" is a limitation of the claims.

Contrary to Petitioners allegation (Reply, 3), the evidence in this case compels the conclusion that the term "stamped" adds structural features to the claimed product. The specification states "austenitizing and hot stamping, displays distinctive features", "hot stamped and quenched in order to obtain a full

martensitic structure" (POR, 44-45) and DeArdo explains at length how stamping changes structure. Ex.2010 ¶¶148-158, Ex. 1052, 129:13-21, 131:4-11, 173:13-174:18.

Further, Petitioner's focus on the discussion of heat treatment with regard to layer formation ignores that what is described is a four-layer *stamped* product (Figure 1) and while the layers form during heat treatment, the *claimed* coating must be a four-layer structure that is retained after stamping. Stamped products are structurally different than unstamped products, and not only in that they are deformed. POR, 59-61, Ex.1052, 129:12-21, 131:4-11, 173:13-174:18, Ex. 2010, ¶¶148-158.

Petitioner's argument (Reply,3-4) that the phrase "coated steel stamped product," *considered in isolation*, is not inventive, is irrelevant. There is no requirement that the preamble be the point of novelty of the claim, merely that it is *part* of the invention defined by the claim. The Federal Circuit's reasoning in the *General Electric and Corning Glass Works* decisions (POR, 39-40) was not premised on "raster scan display device" or "optical waveguide" being *per se* novel, but rather that they formed a part of the novel invention as a whole. The preamble "a coated steel stamped product" is a limitation of claim 1.

III. CORNETTE FIGURE 22 IS NOT STAMPED

A. Heat Treatment In Cornette Does Not Include Or Mean Stamping

Petitioner goes to great lengths in its Reply to try to correct an oversight in their Petition that didn't consider whether Figure 22 captioned as "after heat treatment" is an image of a *stamped* specimen.

To compensate, Petitioner argues that the language "heat treatment" in Cornette does not mean heat treatment, but rather has a convoluted meaning involving a "multi-stage process from heating to cooling, including a *hot-stamping* step." Reply, 11. Contradicting its own definition, Petitioner later claims that heat treatment in Cornette provides an "interchangeable use of 'heat treatment,' 'hot forming,' and 'press hardening process.'" Reply, 16. Neither statement is true.

To begin, the alleged "multi-stage process" is specifically captioned in Cornette Figure 21 as a "Process used for the *hot forming* of USIBOR 1500 Pre-coated." It is not, as Petitioner imagines, captioned "Process used for ~~hot forming~~ heat treatment" because the word "heat treatment" does not mean, infer, or include hot forming. Rather, Figure 21 includes *separate steps* of "Heating 5-10 min 880-950°C" and "Hot Forming and Quenching." Ex.1013-0009. Similarly, under "Mechanical Characteristics", Cornette first discusses properties "[b]efore

heat treatment" and then separately, in the following sentence, discusses "properties after hot forming." (emphasis added). Again, it does not, as Petitioner imagines, read "[b]efore heat treatment" and "properties after ~~hot forming~~ heat treatment." *Cornette uses different words because they mean different things.*

As DeArdo made clear under cross-examination, heat treatment does not include hot stamping. Ex.1052, 138:22-139:7, 20:6-9, 20:4-5, 46:16-17. Petitioner misquotes DeArdo, claiming that he admitted heat treatment includes a cooling/quenching after stamping (Reply, 12), but the cited testimony (Ex.1052, 143:14-144:2, 21:1-4) refers to cooling that occurs when steel is removed from the furnace, not after stamping, and there are no references to quenching.

Petitioner's argument (Reply, 12) that the "French" understand "heat treatment" to "include" stamping lacks evidence, relying on misquoted testimony of DeArdo who agreed to nothing more than that the words "heat treatment" is found in Cornette and the '683 patent (Ex. 1052, 70:3-11: "Q But the French apparently do use the word "heat treatment," right? A Yes); stated that he "didn't know" how the French used the term (*id.*, 68:3-9); and repeatedly explained that heating or heat treatment may be followed by stamping or not (*id.* 46:12-18, 65:7-24, 66:9-67:16, 138:19-139:14, 142:24-143:13).

Further, after arguing at length that the "French" understand "heat treatment" to include stamping (Reply 12), Petitioner later argues that the same "French" understand heat treatment to be "interchangeable" with "hot forming" and "Press hardening" (Reply, 13, 16). Its "evidence"- a website using the terms "hot-stamping heat treatment" (Reply, 13)- only proves that the processes are separate and not interchangeable. If they were interchangeable it would say one or the other. Petitioner's argument of interchangeability is further rebutted by DeArdo who when asked about "heat treatment or hot forming" made it clear that heat treatment is not a "synonym" of hot forming. Ex.1052, 138:19-139:7.

Petitioner creates these convoluted and contradictory definitions because Figure 22, captioned "after heat treatment," is not stamped. It is heat treated which is clear from the four corners of the document. Both Cornette and the '683 patent separately refer to "heat treatment" and "hot stamping/forming." POR, 58, '683 patent, 1:46-50, 3:42, 3:57, 3:63-64, 5:61, 9:21, 14:62-63, Ex. 1013-0009, 10. When Cornette refers to something after it is hot formed, it says hot formed. When it is refers to something that has been heat treated (and not yet, or ever for that matter, hot formed), it says so.

Heat treatment is not a multistage process that includes hot-stamping. To the contrary, one can heat treat a coated steel, take a specimen and an SEM image

afterwards, as Cornette did with Figure 22, all without stamping. Ex.2010, ¶152. Further, as DeArdo testified, a part can be heat treated and never stamped as was the case with POSCO's own internal power point Exhibit 1050. Ex.1052, 187:1-5.

It is Petitioner's burden to prove heat treatment in Cornette does not mean what it says. Petitioner has not met its burden: Figure 22 is heat treated, not stamped.

B. Contrary to Petitioner's Allegation, The Reference To A Cataphoresis Layer In Vaissiere Figures 14 And 15 Does Not Mean The Specimen Is Stamped

To support its allegation that Figure 22 is stamped, Petitioner points to Cornette Figure 22 and the identical Vaissiere Figure 15 as having a cataphoresis layer, and alleges that cataphoresis paint is "only" applied to a stamped part. Reply, 14. However, the presence of a cataphoresis layer on a specimen is in no way evidence that the specimen is stamped, and Petitioner provides no evidence that the SEM images (Reply, 15) shows any effect from stamping. Petitioner's allegation that cataphoretic paint is "only" applied to a stamped part cites to testimony from DeArdo, but he never said that cataphoretic paint is "only" applied after stamping and was referring to parts generally, not specimens, and certainly not Figure 15 of Vaissiere (Ex. 1033) which was not marked, shown, or mentioned

at his deposition. Ex.1052, 4:1-14, 141:24-142:8. Further, the discussion in Cornette of “[m]aterial after cataphoretic paint” (Reply, 14-15) is not in reference to Figure 22, but rather to “painted parts” generally, and in any case, there is no indication anywhere that even these “painted parts” are stamped. Petitioner fails to consider that in a laboratory a coated steel could be coated with a cataphoresis layer, sampled and observed under SEM for adhesion properties. Further, just because stamped parts *can be* painted, it does not follow that Figure 15 of Vaissiere and Figure 22 of Cornette are of a stamped part. A more straightforward interpretation is that Figures 22 and 15 *are what they say they are*: a heat treated specimen that has not been stamped.

C. Contrary To Petitioner's Allegation, References To "Good Quenchability" In Vaissiere, Or "Stamping" In Cornette, Do Not Mean That Vaissiere Figure 15 And Cornette Figure 22 Are Stamped

Petitioner's argument (Reply, 12) that the reference to “good quenchability of parts **during heat treatment**” in Vaissiere means Cornette's heat treatment includes quenching which occurs after hot stamping wrongly assumes that a coated steel cannot be heat treated then quenched without stamping. Under cross examination regarding POSCO's internal power point Exhibit 1050, DeArdo

explained that with POSCO the "samples were never stamped" and that the "job was to evaluate the ductility at room temperature in a heated and quenched flat sheet." Ex.1052, 187:1-5. Further, Petitioner's attempt to tie the statement "good quenchability ..." to Vaissiere Figure 15 is more than a stretch: it is wrong. The statement is not referencing Figure 15, rather it is in Section 2 that discusses general properties of steel and the effect of boron. The image in Section 2 (Figure 4) does not have four layers and is "at delivery," in other words, they are discussing the raw material, not a stamped product. Ex.1033-0004.

Further, simply because Cornette discusses stamping, it does not mean the specimen in Figure 22 is stamped. Specimens can be observed at various stages of a process and the only proof of when the Figure 22 specimen was taken is in the caption of the figure. Ex.2010 ¶152. Similarly, the inclusion of Vaissiere Figure 15 in a section entitled "4-4 *Aptitude* for coating of die quenched parts and *blanks*" (emphasis added) does not mean that it is an image of a stamped part. As the title suggests, you can apply cataphoresis to a blank which is not stamped. A blank is not necessarily stamped ('683 patent, 15:15-17), and steel that is heat treated is not necessarily stamped (*id.*, 1:59-2:6, 12:21-23, 30-33).

IV. CORNETTE'S FIGURE 22 AND VAISSIERE'S FIGURES 14 AND 15 WERE CREATED TO SHOW SURFACE ROUGHNESS ON THE TOP LAYER FOR PAINTING--NOT TO SHOW LAYERS

Petitioner's argument (Reply, 17) that a profile view of a specimen only concerned with surface roughness for painting would not be provided is contrary to common sense. A profile view (Figure 15) shows the surface roughness of the top layer of a coating in side view, while a top view (Figure 14) shows the sample from above. This is the topic of Section 4.4, and Figure 15 of Vaissiere immediately follows the statement "The high roughness level of the alloyed layer results in the cataphoresis having exceptional adherence." There is no discussion of anything in Vaissiere other than the interaction between a top layer of an Al-Si coating and a cataphoresis layer because the image was not prepared to show anything about the interior of the Al-Si coating. Ex.2010, ¶¶79-82, 85, 88-90.

V. CORNETTE DOES NOT HAVE THE CLAIMED FOUR LAYERS

Once the term "layer" is properly construed as meaning "a material spread over the base steel different from other materials spread over the base steel," it is clear that, at minimum, Cornette fails to disclose (a) interdiffusion, (b) intermediate, (c) intermetallic, and (d) superficial layers, that are made of different

materials. Cornette provides no discussion of any of the "layers" of Figure 22, what is asserted as layers (b) and (d) are indistinguishable in color/shade, and Petitioner relies solely on color/shade as defining the layers. Put simply, if Petitioner's reliance on "shade/color" as defining layers is accepted, then it follows that what is asserted as layers (b) and (d) by Petitioner are of the same material and actually one layer.

Cornette Figure 22 was prepared to show surface roughness, not any layer structure. Cornette provides no compositional analysis or discussion of the specimen shown in Figure 22, and thus Petitioner relies solely on tone to determine differences. Reply, 18, Ex, 2011, 75:14-17 ("Q. When comparing the shades of the layers in Figure 22, how do you determine if they're different? THE WITNESS: By looking at the shades"). As explained by DeArdo, while this is something only a "third-grader" would do, Ex.1052, 150:9-13, to the extent anything about any "layers" in the coating could be gleaned from Figure 22, a person of ordinary skill in the art would surmise that what is asserted by Petitioner as layers (b) and (d) look the same, and therefore are of the same material. POR, 53-54, Ex. 2010, ¶¶139-140.

Petitioner has not shown that Cornette Figure 22 shows four layers having "a material spread over the base steel different from other materials spread over the

base steel," nor that the heat treated image shown in Figure 22 would look like Figure 22 after stamping.

VI. PATENTEE'S DISCUSSION OF HEATING RATE IS IN RESPONSE TO PETITIONER'S ARGUMENTS

Petitioners discussion of "heating rate" (Reply, 19) misrepresents Patentee's position. To compensate for the lack of description and identification of the layers in Figure 22, Petitioner asserts that the '683 patent and Cornette processes are the same to bolster its position. Petition 34. Ex.1003 ¶89. In response, Patentee merely points out that the processes are not the same and that Cornette is missing a heating rate.

VII. CLAIM 9

Petitioner is wrong to assert (Reply 1, 20) that stamping at "a strain higher than 10%" and "a cooling rate higher than 50°C/s", *which impart structural features* to the claimed product (POR, 75-77; Ex. 1001, 11:10-29; Ex. 1005, [0006]; Ex. 2010, ¶¶198-201; Petition, 64-65), can be disregarded. To the contrary, where, as here, "the process by which a product is made imparts 'structural and functional differences" distinguishing the claimed product from the

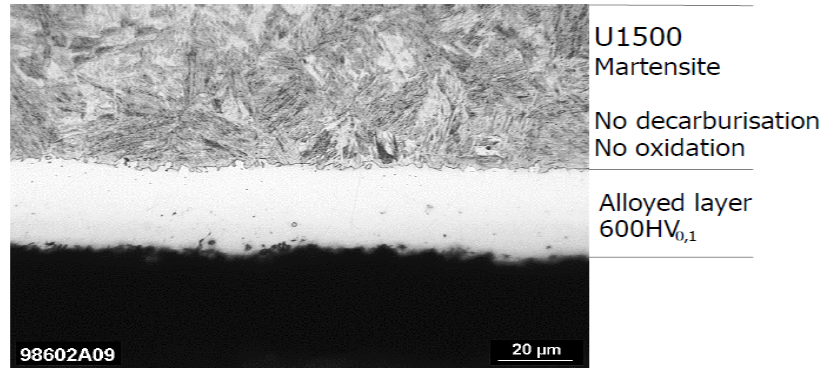
prior art ..." these differences shall be considered. *Greenliant Sys., Inc. v. Xicor LLC*, 692 F.3d 1261, 1268 (Fed. Cir. 2012).

Petitioner asserts (Reply, 21) that the process limitations of claim 9 should be ignored because Cornette in view of Somani disclose the claimed product. However, Cornette Figure 22 is not stamped and stamping changes structure. Indeed, the entire premise of Somani is that strain and cooling rates change the structure of the resulting product (Ex. 1005, Abstract), DeArdo explains at length that stamping changes structure (Ex.2010 ¶¶152-156, Ex. 1052, 129:13-21, 131:4-11, 173:13-174:18), and the claim 9 process limitations result in a fully martensitic structure ('683 patent, 11:23-29).

Petitioner provides no evidence that when stamped and cooled according to Somani, Cornette Figure 22 would have the claimed four-layer coating, and the fully martensitic structure which the '683 patent explains (11:23-29) is the result of stamping and cooling according to claim 9. Cornette admittedly says nothing about a fully martensitic structure (Petition, p. 55), and Petitioner provides no evidence that Figure 22 of Cornette shows fully martensitic steel.

In an attempt to remedy this, Petitioner relies on pages 5-6 of Vaissiere (Reply, 21). First, Vaissiere is not part of the asserted grounds against claim 9.

Further, page 5 is discussing Figure 6 and not Vaissiere Figure 15/Cornette Figure 22; and Figure 6, while martensitic, does not have a four-layer structure:



There is simply no evidence that when stamped and cooled, Cornette Figure 22 would have the claimed four-layer coating and a fully martensitic structure.

Nor does Cornette or Somani disclose the claimed process. In claim 9, the product is “hot formed with a strain higher than 10% and cooled with cooling rate higher than 50°C/s,” and “cooling rate” is defined in the specification as the “mean rate between the exit of the heated blank from the furnace, down to 400° C” (11:23-29). Petitioner admits that “Cornette does not disclose a specific strain or cooling rate.” Petition, 66.

As for Somani, both the process and cooling rate relied on by Petitioner are wrong. Somani is simulating a new “patented manufacturing process” for “[s]imultaneous forming and quenching.” Ex. 1005-0001. In the Somani process, the cooling *begins during or after compression in the stamping die* (“hot

compression and simultaneous or subsequent fast cooling." Ex. 1005-0002),
whereas the claimed cooling rate *begins upon exit from the furnace* ('683 patent,
11:27-29 ("mean rate between the exit of the heated blank from the furnace, down
to 400°C").

To obfuscate this problem, Petitioner creates a fiction that a part is "heated at
900°C," "leaves the (simulated) furnace and is cooled at cooling rates >50°C/s."
Reply, 22-23. Petitioner simply fabricates the language "leaves the (simulated)
furnace" and splices it with the language "cooling rates >50°C/s" which actually
refers to rates while the part is "subjected to a plastic strain." Ex. 1005-0002.
Again, unlike in the claimed process, in Somani cooling *begins during or after hot
compression in the stamping die*. Ex. 1005-0002 ("hot compression and
simultaneous or subsequent fast cooling"), Ex. 1052, 185:14-17; 181:16-182:1
(there are "compression dies surrounded by a furnace" and "you deform in the die
and quench in the die"); Ex. 2010, ¶¶203-209, Ex. 1052, 45:10-12.

Somani does not teach the claimed cooling rate, so there is no basis to
conclude that the process of Somani, if applied to the heat treated specimen of
Cornette Figure 22, would result in the claimed stamped product of claim 9.

Further, as stated more fully at POR 75-77, Somani does not teach or suggest, and in fact teaches away from, using cooling rate as a means of controlling the final microstructure of the steel. Ex. 2010 ¶¶211-220.

VIII. CLAIM 11

Contrary to Petitioner's assertion (Reply 24), Patentee used the "expansive and flexible approach" of *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1739 (2007) and provided reasons why POSITA would not make the proposed modifications. Cornette teaches that **"the best compromise between corrosion protection and weldability is 25µm,"** and none of the asserted references provides any information on how to *control* the thickness, *number or arrangement of layers* in a coating. Consequently, POSITA would have no reasonable expectation of success in making the proposed modification, particularly since Cornette teaches that other thicknesses are disadvantageous. Ex. 1052, 164:18-165:25; Ex. 1013-0009; Ex. 2010, ¶¶176-179.

Petitioner in its Reply impermissibly presents a new rationale for obviousness on Grounds 2 and 7– that allegedly POSITA would be motivated "to reduce the weight and cost of the coated steel stamped product." Reply, 27-28.¹

In any case, Petitioner's assertion that "reducing a thickness of the coating . . . would result in a substantial cost saving as less material is used" (Reply, 23) is based on a conclusory statement of Miles that he "**believe[s]** that reducing a thickness of the coating by 5 μ m (or even 3 μ m) would result in a substantial cost saving as less material is used on each part." Ex. 1003, ¶164. Miles has cited to no authority for this and provided no calculations. His "belief" is speculation.

Nevertheless, this speculation is insufficient to show that the alleged routine experimentation would result in the claimed four-layer structure. The individual layers are formed not by sequential application of four different materials, but during heating by "the interdiffusion" of base steel and pre-coating. Ex. 1001, 15:28-30. This is not a trivial process. Ex. 2010, ¶168.

Further, Petitioner ignores the contrary evidence: that Cornette provides no reason to change the thickness because 25 μ m provides "the best compromise

¹ This rationale was asserted only for Ground 4 (Petition, 60), and should be stricken as to Grounds 2 and 7. 37 C.F.R. § 42.23(b); *Henny Penny Corporation v. Frymaster LLC*, 938 F.3d 1324, 1330-1331 (Fed. Cir. 2019).

between corrosion protection and weldability" (Ex. 1013-0009), that Cornette, Petitioner, and Miles, all recognize the importance and advantages of weldability and corrosion resistance (*Id.*, 10, Reply 16, Ex. 2011, 51:20-24, 52:23-53:2); and that, accordingly, "thinner precoats is going in the wrong direction." Ex. 1052, 165:17-25.

Petitioner's assertion that the result of the alleged "cost-saving" is the coated steel product of claim 11 (Reply, 27-28) rests on Miles' contention that POSITA could reduce the thickness of the coating of Cornette and retain the alleged four-layer structure of Figure 22.

Miles bases his opinion at Ex. 1051, ¶¶15-19, on a test described in the Declaration of Jinkeun Oh (Ex 1066), but Oh discusses neither (i) the composition of the Aluminum-Silicon coating- so there is no way to determine if it is the same coating used in Cornette, nor (ii) the heating, stamping and cooling parameters used- so that that the parameters can be compared, for example to the heating used in Cornette. The failure to disclose the heating parameters used by Oh is egregious because the '683 patent teaches and demonstrates that the formation of layers is affected by the heating parameters (7:7-31, Example 2). There is no evidence that the sample shown in Ex. 1066 was heated according to Cornette (and not for

example, with the heating rate used in Example 2 of the '683 patent to create Figure 1).

Consequently, Miles' declaration fails to comply with 37 CFR § 42.65 and is not entitled to any weight.

As DeArdo testified, it is "pure speculation" that by simply reducing the thickness of the coating, you would obtain a stamped part with the claimed four-layer structure and claimed thicknesses particularly when Cornette states that "**the best compromise between corrosion protection and weldability is 25µm,**" and none of the cited prior art teaches how to control layer formation within the coating of Cornette. Ex 2010, ¶¶179,195-196; Ex. 1052, 164:18-165:25.

Petitioner failed to rebut DeArdo, and Petitioner's citations to his testimony (Reply, 24-25) are misleading as DeArdo did not make these statements in reference to making the coating thinner.

The metallurgical platitudes presented in Engels and cited by Miles at Ex. 1051, ¶21, and relied upon Petitioner (Reply, 28) do not represent a roadmap or recipe for forming the claimed four-layer structure in the coating with layer (a) having a thickness "less than 10 micrometers" and a total "thickness greater than 30 micrometers," neither by themselves nor in combination with Cornette.

There is no evidence that (i) POSITA had a reason to routinely experiment with the coating of Cornette and (ii) that the optimization of Cornette would have resulted in the claimed four-layer structure.

IX. CONCLUSION

Petitioner has failed to establish by a preponderance of the evidence that claims 1-11 of the '683 patent are unpatentable.

Respectfully submitted,

Dated: August 12, 2020

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies this document complies with the type-volume limitation of 37 C.F.R. § 42.24(c). PATENT OWNER'S SUR-REPLY TO PETITIONER'S RESPONSE contains 5576 words, as calculated by Microsoft Word, excluding the parts of this document exempted by 37 C.F.R. § 42.24(c).

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e), the undersigned certifies that on August 12, 2020, a true and correct copy of this PATENT OWNER'S SUR-REPLY TO PETITIONER'S RESPONSE was served in its entirety by electronic mail to the following counsel of record for Petitioner, POSCO:

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