

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BILLERUD AKTIEBOLAG (PUBL),

Petitioner,

v.

WESTROCK MWV, LLC,

Patent Owner

Case No. IPR2023-01206

U.S. Patent No. 11,293,142 B2

DECLARATION OF CHARLES P. KLASS

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I. INTRODUCTION AND QUALIFICATION

1. I, Charles P. Klass, declare as follows:
2. I have prepared this report as an expert witness retained by WestRock MWV, LLC. (“the Patent Owner”). I understand Billerud Aktiebolag (Publ) (“the Petitioner”) has filed a petition requesting *Inter Partes* Review (“the Petition”) of Claims 1, 2, and 4-23 of U.S. Patent No. 11,293,142 (“the ’142 Patent”), which is assigned to the Patent Owner. I have been asked by the Patent Owner to provide my opinions as to the grounds set forth in the Petition for Claims 1, 2, and 4-23 of the ’142 Patent, and the technical bases for these opinions as appropriate.
3. This Declaration contains statements of my opinions formed to date and the bases and reasons for those opinions. I may offer additional opinions based on further review of materials in this case, including opinions and/or testimony of other expert witnesses. I make this Declaration based upon my own personal knowledge and experience and, if called upon to testify, would testify competently to the matters contained herein.
4. As I explain more fully below, it is my opinion that the prior art references cited in the Petition, *Fugitt*, *Papermaking*, *Gratton*, and *Papermaking II*, whether they are considered individually or in combination with one another, do not teach, suggest, or disclose each and every element of Claims

1, 2, and 4-23 of the '142 Patent. Also, it is my opinion that it would not have been obvious to those of ordinary skill in the art at the time of the invention to combine *Fugitt*, *Papermaking*, *Gratton*, and *Papermaking II* with one another.

5. I understand that *Papermaking*, *Gratton*, and *Papermaking II* were not provided to or considered by the U.S. Patent and Trademark Office during examination of the '142 Patent. However, I understand that *Mohan* was provided to and considered by the U.S. Patent and Trademark Office during examination of the '142 Patent. In my opinion, the teachings from *Papermaking*, *Gratton*, and *Papermaking II* that were relied upon in the Petition are cumulative to *Mohan*, and it would have been redundant for the U.S. Patent and Trademark Office to consider *Papermaking*, *Gratton*, or *Papermaking II* for those teachings in view of *Mohan*.

A. Background

6. This section contains a summary of my education background, career history, publications, and other relevant qualifications. My curriculum vitae is attached as Appendix 1 to this Declaration.
7. I am, at present, an independent consultant at my own consulting company. I have six decades of paper industry experience, including the last 35 years as a consultant.

8. In 1962, I was awarded a B.A. in Mathematics with minors in Pulp & Paper Technology and Chemistry from Western Michigan University. In 1968, I was awarded an M.B.A. from Pace University. My current position is president of Klass Associates Inc., a consulting company I founded that offers professional consulting for the global pulp, paper, paperboard, and packing industry. I am currently an adjunct professor of Chemical & Paper Engineering at Western Michigan University. I have numerous publications in technical journals and trade magazines on pulp and paper manufacturing technology, and other industry-related topics. I have co-authored and contributed to paper technology textbooks. For example, I served as a book reviewer for the *Papermaking II* reference cited by the Petitioner. I am a named inventor on four issued U.S. patents on papermaking and coating chemicals in addition to three foreign patents and two published patent applications. I was inducted into the Paper Industry International Hall of Fame. I am a fellow of TAPPI (Technical Association of the Pulp & Paper Industry, Inc.), the organization that published the *Papermaking* and *Papermaking II* references together with the Finnish Paper Engineers' Association. I have also been awarded and honored with numerous awards and honors, including numerous awards and honors from TAPPI and

Western Michigan University. A summary of my relevant employment history is as follows:

- i. 1957-1958: Department of Pulp and Paper Technology,
Western Michigan University, Kalamazoo, MI – Laboratory
and pilot plant technician;
- ii. 1959-1960: Hamilton Paper Co., Plainwell, MI – worked night
shift as deinking/bleach plant chemist to finance education;
- iii. 1960-1961: Oxford Miami Paper Co., West Carrollton, OH –
Laboratory technician;
- iv. 1962-1963: Union Camp Corp., Savannah, GA – Process
Engineer;
- v. 1963-1964: Westvaco Corp., Luke, MD – Operating Engineer;
- vi. 1964-1968: Paper Trade Journal, New York, NY – Associate
Editor;
- vii. 1969-1975: Merck Paper Chemicals, Rahway NJ – Sales
Representative/Product Manager/Marketing Manager;
- viii. 1975-1977: Lockport Felt Division of Carborundum Co.,
Newfane, NY – General Sales Manager;
- ix. 1978-1981: Asten Group Inc., Devon, PA – Corporate
Marketing Director/Director of International Sales;

- x. 1982-1986: BTG Coating Systems, Dallas, TX/Inventing of America Ltd., King of Prussia, PA – Vice President; and
- xi. 1986-Present: Klass Associates Inc., Radnor, PA and Madeira Beach, FL

9. I have extensive experience regarding paperboard materials and manufacturing paperboard, including both hard and soft nip calendering and coating. Over the past four decades, I have done numerous paperboard product development projects that included participation in both pilot and mill trials of coating and calendering methods and impacts on sheet structure, bulk and stiffness, printability in offset, gravure and digital imaging. Calendering techniques evaluated included conventional hard nip calendering, gloss calendering, hot soft calendering, and temperature gradient calendering.

B. Compensation

10. For my efforts in connection with the preparation of this Declaration I have been compensated at my standard consulting rate of \$425/hour. My compensation is in no way contingent on the results of these or any other proceedings relating to the '142 Patent.

II. DOCUMENTS AND MATERIALS

11. I have considered information from various sources in forming my opinions. I have reviewed and considered each of the exhibits listed in the attached Appendix 2 (Materials Considered) in forming my opinions. I have also reviewed and considered the Petition and the Declaration of Carl Zotterman that accompanied the Petition. In forming my opinions, I have also relied on my experience and education.

III. UNDERSTANDINGS OF THE LAW

12. For purposes of this Declaration, Counsel has informed me of certain legal standards in patent law that are relevant to my opinions. I have applied these standards in forming opinions below.
13. I understand that in an *Inter Partes* Review, the Petitioner has the burden of proving unpatentability by a preponderance of the evidence. I understand this standard is different from the standard that applies in a district court, where I understand a challenger bears the burden of proving unpatentability by clear and convincing evidence.
14. I understand that a patent claim may not be patentable even though the invention is not identically disclosed or described in the prior art, but only if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious

to a person having ordinary skill in the relevant subject matter at the time the invention was made.

15. I understand that to determine if a claim is obvious, the following factors should be considered: (1) the level of ordinary skill in the art at the time the invention was made; (2) the scope and content of the prior art; (3) the differences between the claimed invention and the prior art; and (4) secondary considerations including evidence of commercial success, long-felt but unsolved need, unsuccessful attempts by others, copying of the claimed invention, unexpected and superior results, acceptance and praise by others, independent invention by others, and the like.
16. I understand that the combination of familiar elements according to known methods may or may not be obvious, and it is informative to consider whether it does no more than yield predictable results. I also understand that the inferences and/or creative steps that a person of ordinary skill in the art would employ may be taken into account in determining whether an invention is obvious.
17. I understand that determining whether an invention is obvious turns on whether a hypothetical person with ordinary skill and full knowledge of the pertinent prior art, when faced with the problem to which the claimed invention is addressed, would be led naturally to the solution adopted in the

claimed invention. Factors to be evaluated in this analysis include the factors referenced above.

18. I understand that there must be a proper rationale for combining prior art references, and that the following rationales may be used to determine whether a prior art reference can be combined with other prior art or with other information within the knowledge of one of ordinary skill in the art:
- i. Combining prior art elements according to known methods to yield predictable results;
 - ii. Simple substitution of one known element for another to obtain predictable results;
 - iii. Use of known techniques to improve similar devices (methods, or products) in the same way;
 - iv. Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results;
 - v. “Obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
 - vi. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to one of ordinary skill in the art; or

- vii. Some teaching, suggestion, or motivation in the prior art would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.
19. I understand that in order for a claim to be obvious, each and every element recited in the claim must be accounted for, and that if even one element recited in the claim is not accounted for in the prior art, there is no *prima facie* case of obviousness.
20. I understand that in order to combine references to formulate a *prima facie* case of obviousness, the combination itself must be nonobvious, based on one or more of the rationales above. Without a proper rationale to combine the references, a given claim is not obvious. For example, there must be a proper teaching, suggestion, or motivation, or other proper rationale, to combine the references. I understand that the prior art must be considered in its totality, that a claim is not obvious if there are teachings in the prior art that lead contrary to the combination of references. I understand that a claim is not obvious if the combination of prior art would require one of ordinary skill in the art at the time of the invention to use impermissible hindsight derived from the disclosure of the patent/application itself.

21. I understand that when a work is available in one field of endeavor, design incentives and/or other market forces, for example, can prompt variations of it, either in the same field or a different one. Moreover, if a person of ordinary skill can implement a predictable variation, I understand that may bar its patentability.
22. I understand that common sense is a factor to be considered in evaluating obviousness. For example, if common sense would teach against a combination of references, a person of ordinary skill in the art will not be expected to have arrived at a claimed invention as obvious.
23. I understand that in order to qualify as prior art, a given reference must have enabling disclosure for the teachings upon which it is relied. If the disclosure of a given reference is non-enabling for the teachings upon which it is relied in a ground of obviousness, the ground for obviousness is improper. For example, if a prior art reference is relied upon for its teaching of something that is in fact impossible, the grounds for obviousness that rely on that teaching are improper.
24. I understand that the Supreme Court articulated additional guidance for determining obviousness in its *KSR* decision. My understanding is that the Supreme Court held that people of ordinary skill can look for guidance in other solutions to problems of a similar nature, but that the obviousness

inquiry must track reality, and not legal fictions. I have relied on these understandings in expressing the opinions set forth below.

25. My opinions are based upon the information that I have considered to date. I reserve the right to supplement my opinions in the future to respond to any arguments raised by the Petitioner and to take into account new information that becomes available to me.

IV. PERSON OF ORDINARY SKILL IN THE ART

26. I do not dispute the factors the Zotterman Declaration discusses at ¶ 23 regarding the characteristics of a hypothetical person of ordinary skill in the art of the '142 Patent at the time of the claimed invention. However, I do dispute the level of skill which the Zotterman Declaration determined to be “ordinary” at ¶24. (Ex. 1003, ¶24). It is my opinion that the hypothetical person having ordinary skill in the art is a person with a bachelor’s degree in paper science and engineering, chemical engineering, process engineering, mechanical engineering, or a related degree with *no more than* three to five years of experience in paperboard manufacturing, or a person with a master’s degree as their highest degree in paper science and engineering, chemical engineering, process engineering, or mechanical engineering, or a similar field with a specialization in paperboard manufacturing. A person who had studied pulp and paper technology or paper engineering would

understand the dynamics and results of calendering when graduating, whereas it is normal for a person in a general chemical or mechanical engineering degree to need three to five years of papermaking experience to become a person of ordinary skill in the art. My opinions herein are based on the level of skill of the above person.

27. My opinions in this declaration still apply even under the Petitioner's definition of the level of ordinary skill in the art. For reasons I outline below and throughout this Declaration in detail, hot-hard calendering as described and claimed in the '142 Patent was not well known in the art in May 2019. I disagree with the Zotterman Declaration with respect to the innovative methods of manufacturing in the '142 Patent, which I see as groundbreaking developments for the time period of May 2019.

V. THE '142 PATENT

28. In this section, I provide my summary of the disclosure of the '142 Patent, and a summary of the examination of the '142 Patent in the U.S. Patent and Trademark Office.

A. Summary of the '142 Patent

29. The application for the '142 Patent was filed May 7, 2020 and was assigned Serial No. 16/869,156 ("the '156 Application") and included a priority claim to a previously filed provisional application, namely U.S. Provisional Patent

Application Serial No. 62/846,278 filed May 10, 2019. The '142 Patent issued on April 5, 2022. The title of the '142 Patent is “Smooth and low density paperboard structures and methods for manufacturing the same.”

30. The “Background of the Invention” section of the '142 Patent explains that conventional paperboard manufacturing techniques achieved smoothness through a wet stack calendering process in which the paperboard is rewetted and passed through a calendering device having two or more hard rolls. The '142 Patent stated that while wet stack calendering smooths paperboard by compressing the fiber network through a nip load, the density of the paperboard is increased. (Ex. 1001, 1: 28-39). The patent explained that the increased density is not a desired characteristic for most paperboard structures, and that traditionally a tradeoff must be struck between smoothness and density for paperboard. (*Id.* at 1:35-39). The '142 Patent represents an advance over prior conventional techniques, specifically, the '142 Patent provides for an improvement in the tradeoff between smoothness and density for paperboard, e.g., achieving greater smoothness with less density.

31. The “Detailed Description” of the ’142 Patent explains the inventive process of manufacturing a paperboard substrate with reference to Fig. 2, which is reproduced below.

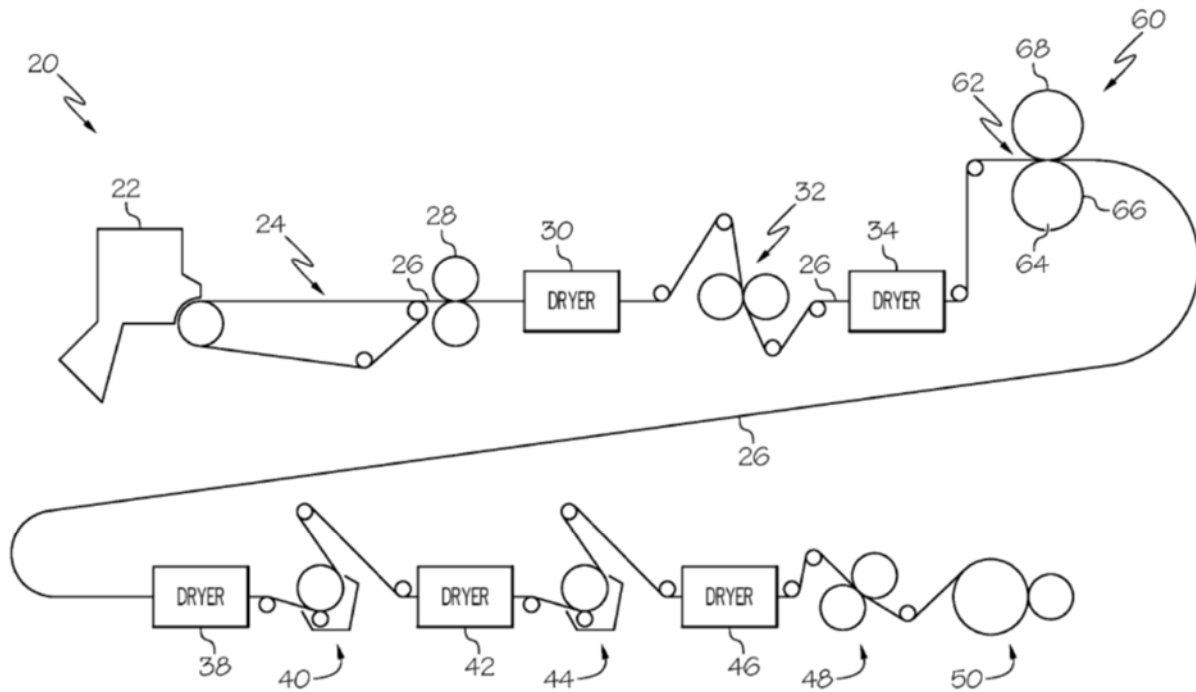


FIG. 2

32. Beginning from a headbox 22, which discharges a fiber slurry onto a Fourdrinier 24, a paperboard substrate 26 passes through one or more wet presses 28, one or more driers 30, a size press 32, and an optional dryer 34. (*Id.* at 5:27-36). Then the paperboard substrate 26 passes through the hot-hard calender 60 to become a calendered paperboard substrate. (*Id.* at 5:37-38). It is this hot-hard calender 60 that is a point of much discussion in the present proceeding. After the hot-hard calender 60, the calendered

paperboard substrate passes through one or more dryers 38, 46, and coaters 40, 44, then optionally through a gloss calender 48 and finally onto a reel 50. (*Id.* at 6:5-22).

33. The hot-hard calender 60 includes a nip 62, the gap defined between the rollers 64, 68, which can be loaded to apply a nip load to the paperboard substrate 26 passing therethrough. (*Id.* at 5:39-40). The two rollers 64, 68 include the thermo-roller 64 and the counter roller 68. (*Id.* at 5:40-42). The contact surface 66 of the thermo-roller 64, i.e., the surface that contacts the paperboard substrate, is heated to an elevated temperature. (*Id.* at 5:45-47).
34. The contact surface of the counter roller 68 is not discussed in the '142 Patent, but a person of ordinary skill can readily infer that it is not heated. In fact, more likely in practice the counter roller 68 is cooled to keep heat from the thermo-roller 64 building up in the counter-roller 66, which would heat the paperboard substrate from both sides. A person of ordinary skill can readily infer this from the facts that give context in the '142 Patent. For instance, none of the Examples 1-6 in the '142 Patent describe heating both sides of the paperboard substrate. (*Id.* at 6:40-10:5). Moreover, as oriented in Fig. 2 it is the bottom side of the paperboard substrate that contacts the heated contact surface 66, and with the configuration of coaters 40 and 44 shown, only this one side of the paperboard substrate is coated. (*Id.* at Fig.

- 2). In order to avoid unnecessary densification of the paperboard substrate, the uncoated side would not be heated in the hot-hard calender. These facts are accounted for in my comments on claim construction for the terms “hot-hard calender” and “counter roller” below. There is a variant shown in Fig. 3 of the ’142 Patent, where there is a second counter roller 69, but just like the first counter roller 68, the second counter roller only contacts the non-heated, non-coated side of the paperboard substrate 26. (*Id.* at Fig. 3). The second counter roller 69 is not heated for the same reasons as the first counter roller 68.
35. There are two other calenders discussed in the ’142 Patent. In both of these, the patent specified surface temperatures *plural*. The first instance of this is in reference to the optional gloss calender 48 shown in the above reproduced Fig. 2 of the ’142 Patent. For each of the six examples the plural roller surface temperatures (plural) for the gloss calender 48 are given as 200 °F. The second instance is in reference to the 4-nip calenders used in the comparative examples, which the patent described as, “instead of being calendered by a hot-hard calender, the paperboard substrates of the Comparative Examples were calendered using a traditional calender under traditional calendering conditions.... and the roller surface *temperatures* were much lower at 200 °F.” (*Id.* at 10:17-24, emphasis added). Notice the

emphasis on surface temperatures plural in the preceding quotation. The '142 Patent consistently referred to calenders with both (or multiple) heated contact surfaces as having plural surface temperatures, and conversely when referring to the hot-hard calender 60, the patent consistently referred to the contact surface being heated to an elevated temperature in the singular. The '142 Patent never refers to the counter-roller as being heated or having an elevated temperature. A person having ordinary skill can therefore safely conclude that the counter-roller 68 is not heated.

36. The '142 Patent provides Examples 1-6 for six different paperboard structures. (*Id.* at 6:40-10:5). The Examples provide the details of the coatings used, the basis weights of the paperboard substrate before calendering and coating, the nip loads used in the hot-hard calendering, the thermo-roller contact surface temperature for each example, and the resulting surface smoothness and basis weight for each example. The six examples give thermo-roller contact surface temperatures of 480 °F for Examples 1-3 and 500 °F in Examples 4-6. For Examples 1-3, the initial paperboard substrate had a basis weight of 145 lbs/3000 ft², and for Examples 4-6, the initial paperboard substrate had a basis weight of 104 lbs/3000 ft².

37. The resulting surface smoothness, measured in Parker Print Surf (PPS 10S), ranged from 1.7 to 1.9 microns for Examples 1-3 where the contact surface temperature was 480 °F, and ranged from 1.3 to 1.4 microns for Examples 4-6, where the contact surface temperature was 500 °F. The resulting bulk, inferred from caliper points (where more points means less dense, more desirable paperboard), for Examples 1-3 ranged from 15.1 to 15.5 points, where the contact surface temperature was 480 °F, and ranged from 10.3 to 10.6 points, where the contact surface temperature was 500 °F.
38. The '142 Patent also gives six comparative examples, one for each of the six examples described above. The comparative examples each started with the same paperboard substrate as their respective one of the six examples, but were calendered with a traditional 4-nip calender with roller surface temperatures of 200 °F and considerably higher nip loads. By comparison, the comparative examples ended up with higher density paperboard structures over a comparable range of smoothness. This can be seen in TABLE 2 of the '142 Patent. To a person of ordinary skill in the art, this proves that the hot-hard calendering disclosed in the '142 Patent yields a better tradeoff between density and surface smoothness than with traditional calendering.

39. Fig. 4 in the '142 Patent, reproduced and annotated below, shows caliper density versus caliper points for Examples 1-6 and for numerous prior art points. Notice the separate groupings of data points for Examples 1-3 and for Examples 4-6 which both show lower density than the prior art data points of comparable caliper. Thus, Fig. 4 shows an advance into an area of density/caliper space that was previously unattained.

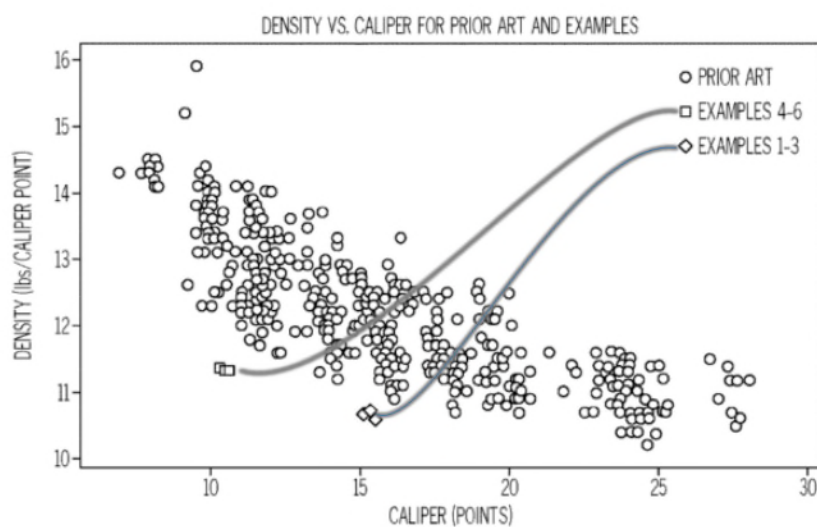
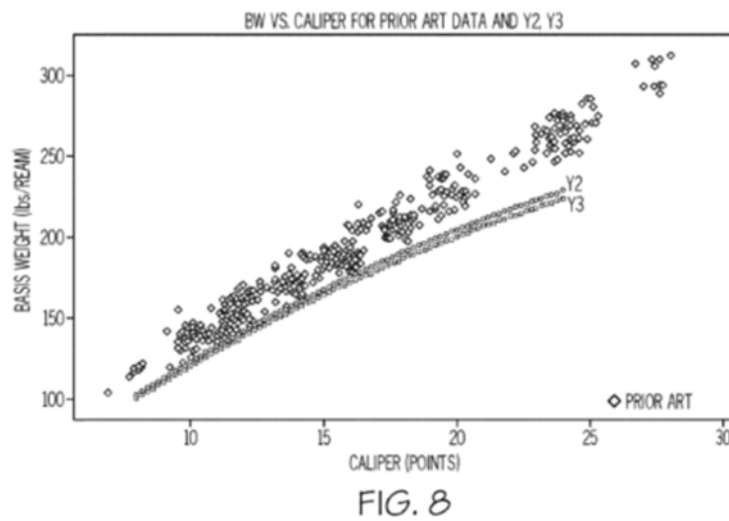
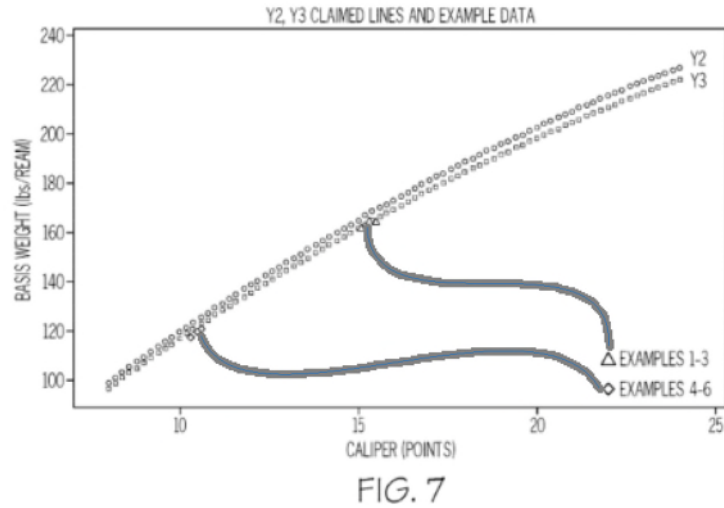


FIG. 4

40. Fig. 7 in the '142 Patent, reproduced and annotated below, shows two parabolic curves of basis weight as a function of caliper points. Basis weight is related to density such that a lower basis weight is desirable. Notice in particular that the curve labeled Y_2 is recited as an element in Claim 1, i.e., $Y_2 = 3.71 + 13.14X - 0.1602X^2$. As shown in the annotated version of Fig. 7 below, all six of the examples in the '142 Patent are *below* the Y_2 curve. In

Fig. 8, reproduced below, the Y₂ curve is shown again, this time with the prior art data points, which all lie *above* the Y₂ curve.



B. Examination of the '142 Patent

41. During prosecution of the '156 Application, the Examiner issued a non-final Office Action that rejected the claims over U.S. Patent Application Publication No. 2009/0236062 to *Fugitt*, et al. ("*Fugitt*"). (See, e.g., Ex. 1002, pp. 73-75). In the Non-Final Office Action, Claims 1-3 were the only

claims under consideration. (*Id.*). The Examiner rejected Claim 1 as anticipated by *Fugitt* and rejected Claims 2-3 as obvious over *Fugitt*. (*Id.*). Claim 3 recited an “elevated temperature is at least 250 °F.” (*Id.*, *see also* Ex. 1002, p. 12). In rejecting Claim 3, the Examiner stated, “[t]he thermo-roller elevated temperature is not disclosed [in *Fugitt*], however, it would have been obvious to one skilled in the art at the time the ’156 Application was filed, that the thermo-roller elevated temperature be optimized in order to obtain desired smoothness of the paperboard product.” (Ex. 1002, p. 75).

42. In reply to a Non-Final Office Action, the Patent Owner submitted an amendment and response, adding language to Claim 1 reciting that the thermo-roller is “heated to an elevated temperature of at least 250 °F,” as in original Claim 3, and amended the temperature recited in Claim 3 to be at least 500 °F. (Ex. 1002, pp. 82-89). The Patent Owner argued that while “[t]raditional calenders may employ rollers that are heated to temperatures that are greater than ambient temperature... the claimed method requires a temperature that is significantly hotter than traditional temperatures—specifically, an elevated temperature of at least 250 °F—which is not disclosed or suggested by *Fugitt*...” (*Id.* at 88).
43. The Zotterman Declaration at ¶ 85 indicates the temperatures in *Papermaking* contradict the Patent Owner’s statement above. (Ex. 1003, pp.

30-31). I disagree—the Patent Owner’s statement about the traditional calender temperatures is correct because the temperatures in *Fugitt* were in line with the traditional calender temperatures.

44. The context of the exchange between the Examiner and the Patent Owner included the caliper/basis weight range predicated by the equation in Claim 1. In discussing the prosecution of the ’142 Patent, the Zotterman Declaration did not properly account for the Y_2 curve recited in Claim 1. Indeed, the temperature range of at least 250 °F added to Claim 1 distinguished over *Fugitt*. The smoothness, caliper, and basis weight in *Fugitt* were obtained using special coatings and not with the roller temperature *per se*. But the Y_2 equation in Claim 1 implies temperatures not of exactly 250 °F but *above* 250 °F. I believe given the Y_2 equation of Claim 1, the recited temperature range of *above* 250 °F contemplates temperatures approaching 480-500 °F as in the examples in the ’142 Patent. Thus, the Patent Owner’s remarks during prosecution were consistent with Claim 1 and with the traditional calender temperatures.
45. It is my opinion that what attracted the attention of the Examiner to *Fugitt*, and also the interest of the Petitioner, is Example 3 in *Fugitt*. The Examiner was tasked with finding out if any prior art disclosed a method as recited in Claim 1, including a paperboard structure with smoothness (PPS 10S) being

at most 3 microns and a basis weight properties that would fall under the Y2 curve in Claim 1. Example 3 is the only place in *Fugitt* where there is an example that falls under the Y2 curve of Claim 1, and no other cited prior art provides such a paperboard structure, including *Mohan* and the Petitioner's newly cited references, *Papermaking*, *Gatton*, and *Papermaking II*.

46. The Examiner updated his search in view of the Patent Owner's amendments and arguments. (Ex. 1002, p. 108). Ultimately, the Examiner found the Patent Owner's argument persuasive. (Ex. 1002, p. 103). In the Notice of Allowance dated November 11, 2021, the Examiner provided a statement of reasons for allowance. The Examiner stated the primary reason for allowance was "that the cited prior art does not disclose a method for manufacturing a paperboard structure per steps claimed, the method including passing a paperboard substrate through a nip of a hot-hard calender, wherein the nip is defined by a thermo-roller and a counter roller, and wherein the contact surface of the thermo-roller is heated to an elevated temperature of at least 250 °F (claim 1)." (*Id.*). I agree with the Examiner's reasons for allowance.

VI. CLAIM CONSTRUCTION

47. I disagree with the Petitioner's claim construction set forth in the Petition, and provided in the Zotterman Declaration, for the claim terms "hot-hard

calender” and “counter roller.” For purposes of this Declaration, I do not dispute the Petitioner’s claim construction, and the claim construction in the Zotterman Declaration, for the terms “paperboard substrate,” “nip,” “thermo-roller,” “basecoat,” and “topcoat.” I reserve the right to reconsider and disagree on such claim terms if new arguments or information come to light.

48. In the following sections, I provide my opinion on how the disputed claim terms of the ’142 Patent should be construed. I understand that for purposes of this proceeding, these claim terms are to be given their ordinary and customary meaning as understood by one of ordinary skill in the art, the specification, and the prosecution history.
49. My understanding of the “plain and ordinary meaning” standard is that it was originally applied, and still is, in district courts for patent litigation, and that it is referred to as the *Phillips* standard. It is my understanding that the U.S. Patent and Trademark Office now applies the *Phillips* standard in IPR proceedings, giving claim terms their plain and ordinary meaning in view of the specification from the viewpoint of a person of ordinary skill in the art. For my claim term constructions below, I apply the *Phillips* standard. So unless otherwise stated, I am applying the plain and ordinary meaning to the claim terms.

50. I understand that in accordance with the *Phillips* standard, the evidence in the intrinsic record is given more weight than evidence from outside the intrinsic record. The intrinsic record includes the original application and the prosecution history. I understand that in this proceeding, *Papermaking* and *Gratton* are extrinsic evidence and should be given less weight than the intrinsic record. Since I do not believe the intrinsic record is wanting of any explanation of the disputed claim terms, I do not rely upon *Papermaking* or *Gratton* to construe the disputed terms.
51. In forming my opinions below about the claim terms, I do not address indefiniteness for the disputed terms. The Petitioner has not alleged indefiniteness, and I do not believe there are any indefiniteness issues with the claims, since a person of ordinary skill in the art would readily be able to determine the scope. Moreover, although I disagree with the Zotterman Declaration-- that the prior art does not fall squarely within the boundaries of the claims, I nonetheless agree with the Zotterman Declaration inasmuch as this case does not hinge upon the margins of meaning. (Zotterman Declaration, ¶56). The prior art squarely fails to read on the claims, so much so that there would be no uncertainty for one of ordinary skill in the art to ascertain the boundaries of the claims versus the prior art. Therefore, I do not offer a detailed term by term analysis of definiteness or indefiniteness. It

is my opinion that the terms identified below should be construed in the manner outlined below.

A. “hot-hard calender”

52. Claims 1, 2, 4, and 5 recite the term “hot-hard calender.” “Hot-hard calender” should be construed to mean “a calender defined by at least two hard rollers wherein one roller is heated to the elevated temperature.” Examples of suitable hard rollers include metallic or heat resistant resin composite rollers. (Ex. 1001, 5:42-44). The elevated temperature is defined as “at least 250 °F” in Claim 1 and further defined as “at least 500 °F” in Claim 3. “Hot-hard calender” should not be construed to mean, “at least one roller is heated to a temperature above ambient temperature” as it is stated in the Petitioner’s construction (Pet., p. 8, emphasis added). Ambient temperature is not referenced in the ’142 Patent.
53. The Petitioner’s construction of “hot-hard calender” is incorrect because the Petitioner has gone out of their way to encompass calenders where more than one roller is heated to the elevated temperature. There is no basis in the intrinsic record for extending the breadth of “hot-hard calender” to include calenders with more than one roller that is heated to the elevated temperature. The Petitioner’s inclusion of calenders having more than one

roller heated to the elevated temperature appears to have relied solely on the Zotterman Declaration at ¶¶ 59 and 70. (Pet., pp. 8-9).

54. Paragraphs 59 and 70 in the Zotterman Declaration are the places Zotterman insinuates a hot-hard calender has more than one roller heated to the elevated temperature. However, neither the Petition nor the Zotterman Declaration provide any reasoning or evidence to support the insinuation that a hot-hard calender can have more than one roller heated to the elevated temperature.
55. Aside from unproven statements made in ¶¶ 59 and 70 of the Zotterman Declaration, other portions of the Zotterman Declaration that provide citations to the intrinsic record actually support a claim construction where only one roller is heated to the elevated temperature. (See Ex. 1003 at ¶¶ 59-65, e.g., ¶ 60). For instance, the Zotterman Declaration states, “[f]igure 2 of the ’142 patent provides the hot-hard calender ‘compris[es] a nip defined by a thermo-roller and a counter roller,” where it is conspicuously missing any suggestion that the counter roller may be heated to the elevated temperature. (Ex. 1003 at ¶¶ 59-65, e.g., ¶ 60). Simple logic predicates that calling one roller a “thermo-roller” and specifying its surface temperature range, while referring to the other roller as “counter roller” without any mention of its surface temperature, means that only the thermo-roller is heated to the

elevated temperature. There is only one thermo-roller in each calender shown or described in the '142 Patent. There is no calender in the '142 Patent that has more than one thermo-roller. The weaknesses of ¶¶ 59 and 70 of the Zotterman Declaration are further discussed below.

56. With respect to ¶ 59 of the Zotterman Declaration, there is no actual explanation or authority cited for why “hot-hard calender” should be construed broadly enough to include more than one roller heated to a temperature above ambient. (Ex. 1003 at ¶ 59). However, in their claim construction for “hot-hard calender,” the Petitioner and Zotterman appear to be paraphrasing from *Papermaking*, which says, “[t]he temperature gradient calender is a two-roll hard-nip calender with at least one of the rolls heated to high operating temperatures.” (See Ex. 1005, p. 40). A temperature above ambient, as in the Petitioner’s construction, is not a high operating temperature per the previous quotation from *Papermaking*. The foregoing quote from *Papermaking* describes a type of calender called a “temperature gradient calender” and there is no reason provided in the Petition or in the Zotterman Declaration for why a “temperature gradient calender” should be equated with a “hot-hard calender” as disclosed in the '142 Patent. The Zotterman declaration appears to be attempting to appropriate *Papermaking*’s definition of “temperature gradient calender” as extrinsic

evidence to broaden “hot-hard calender” as recited in Claim 1 to include *at least* one roller heated to the elevated temperature. But the intrinsic record only supports one roller heated to the elevated temperature. The Zotterman Declaration’s line of reasoning is also undermined by the fuller context of *Papermaking*, which goes on to say, “[h]eating up both nip rolls, however, is complicated because the other roll is a deflection-compensated roll. Because of the benefits of soft-calender technology, this kind of calendering has remained very rare in spite of the amount of research work done.” (See Ex. 1005, p. 40). This quote from *Papermaking* clearly undercuts any notion that the plain meaning of “hot-hard calender” as understood by one of ordinary skill in the art, would include a “very rare” and “complicated” counter roller from *Papermaking*.

57. The Petitioner made an attempt to apply the intrinsic record to construe “hot-hard calender,” but that attempt contains fundamentally flawed logic. Specifically, the Petitioner relies on the Examiner’s characterization of the calender in *Fugitt* in the Non-Final Office Action, where the Examiner stated, “at least some of the rolls in nips with counter rolls in the calender 36 are steam heated to an elevated temperature [0026].” (Ex. 1002 p. 45, citing Ex. 1004, ¶ 65). However, this broadens the meaning of “hot-hard calender” beyond the plain meaning of “hot-hard calender” to include more than one

roller heated to the elevated temperature in Claim 1. (*Id.*). What *Fugitt* says at ¶26 is “[t]he rolls of the calender may be steam heated.” (Ex. 1004, ¶26). In formulating the rejection, the Examiner needed to find a thermo-roller in *Fugitt*. The fact that *Fugitt* discloses more than one roll of the calender 36 may be steam heated was sufficient for the Examiner to cite *Fugitt* as teaching of a thermo-roller. It should be noted that the calender in *Fugitt* is a dry stack calender 36 with six rolls, through which the substrate would snake, very different from the hot-hard calenders shown in the ’142 Patent. Still, none of this even implies that any counter-roller in the “hot-hard calender” nip of Claim 1 is heated to the elevated temperature. It does not follow logically that Claim 1 should be broadened to include multiple rollers heated to the elevated temperature just because *Fugitt* is broad enough to encompass multiple heated rollers.

58. The construction of “hot-hard calender” as including only one roller heated to the elevated temperature is correct because it is supported by the intrinsic evidence. In every mention of the hot-hard nip in the ’142 Patent, it includes a thermo-roller and a counter roller, where the contact surface of the thermo-roller is heated to an elevated temperature. (See Ex. 1001, 2:1-5, 5:37-51, 6:47-50, 7:17-20, 7:54-57, 8:25-28, 8:62-65, 9:32-35). The heated surface of the thermo-roller is labeled with reference character 66 in the drawings and

is described in the '142 Patent, as being heated to at least 250 °F. (at Ex. 1001, 5:63-65). There is no reference character given for the surface of any counter-roller of a hot-hard calender, there is no mention of heating any counter-roller of a hot-hard calender, nor is the temperature of the surface of any counter-roller discussed for a hot-hard calender. (*See generally*, Ex. 1001).

59. Information about the heating of the hot-hard calender can be inferred from what the '142 Patent says about the optional gloss calender, which can be used after the hot-hard calender e.g., as a finishing process. (Ex. 1001, 6:13-17). For each example given in the '142 Patent, there is a final calender process that is a gloss-type calender (not recited in Claim 1) where roller surface temperatures (*plural*) were maintained at around 200 °F. (*See* Ex. 1001, 7:2-3, 7:35-40, 8:5-11, 8:43-49, 9:13-18, and 9:50-55). The fact that the “hot-hard calender” is only ever mentioned in the context of the thermo-roller being heated, and that in every example of the gloss-type calender the '142 Patent indicates plural surface temperatures heated to 200 °F, substantiates that any counter rollers in the hot-hard calender are not heated to the elevated temperature.
60. While my claim constructions rely upon the intrinsic evidence, I want to address *Papermaking* since the Petition and the Zotterman Declaration rely

upon it so heavily. *Papermaking* lists various types of calenders including: hard-nip calenders, two-roll hard-nip calenders, soft calenders, gloss calenders, two-roll soft calenders, three-roll soft calenders, supercalenders, multi-nip calenders, Janus calenders, OptiLoad calenders, ProSoft calenders, show-nip calenders, metal belt calenders, wet stack calenders, breaker stack calenders, friction calenders, embossing calenders, and precalenders. (Ex. 1005 at pp. 35-67 and 82). There is no definition given in *Papermaking* for “hot-hard calender” despite the foregoing encyclopedic list of calender types featured in *Papermaking*. *Papermaking* does not contradict my construction of “hot-hard calender” and the lack of any mention of a “hot-hard calender” supports a construction that the inventors in the ’142 Patent designated a new type of calender as a “hot-hard calender.” This underscores the importance of turning inward to the intrinsic evidence for constructing “hot-hard calender.”

61. The Patent Owner’s constructions of “hot-hard calender” is correct because the fact that the counter-roller is not heated can be directly deduced from the plain and ordinary meaning based on all of the intrinsic evidence as explained above. The Petitioner’s construction of “hot-hard calender” is incorrect because it is inconsistent with the intrinsic record, and instead relies heavily on inferences derived from extrinsic evidence.

B. “counter roller”

62. The Petitioner construed “counter roller” as a roller that is opposite of a thermo-roller. I agree with this construction except to the extent that the Petitioner’s construction of “hot-hard calender” implies that the “counter roller” may be heated to the elevated temperature. (*See* Claim Construction (A), above), and except to the extent that the Zotterman Declaration implies a “counter roller” can itself be a thermo-roller.
63. The Petitioner’s constructions of “hot-hard calender” and “counter roller” considered together imply that the “counter roller” can be heated to the elevated temperature. The “counter roller” in a “hot-hard calender” is not to be construed as being heated to the elevated temperature for the reasons already set forth above with respect to my construction of “hot-hard calender.” It is already explained above in my Claim Construction (A) that the “hot-hard calender” has only one thermo-roller in accordance with the plain and ordinary meaning derived from the intrinsic evidence.
64. The Zotterman Declaration has an interesting opinion at ¶70. The paragraph states that a “counter roller” is a roller that is opposite of a thermo-roller. (Ex. 1003 at ¶70). That seems plain enough, but next, ¶70 says “Gratton further demonstrates this,” citing to Gratton Fig. 1. (Ex. 1003 at ¶70, citing Ex. 1006 at Figure 1, p. 81). There is no substance to the *non sequitur*

sentence about *Gratton*, and it is as if Zotterman wants the reader to believe that *Gratton* supports the statement that a “counter roller” is a roller that is opposite of a thermo-roller. Instead, in reality *Gratton* does not discuss this issue. In *Gratton* there are two rollers, both of which are shown to be heated to the same temperature. (*Id.* at Fig. 1). There is no sense in which one roller in *Gratton* is a thermo-roller and the other is a counter roller. They are both thermo-rollers in *Gratton*, thus the calender in *Gratton* is not a hot-hard calender as in Claim 1 of the ’142 Patent. The configuration in *Gratton* heats both sides of a paperboard substrate passing through the nip, giving up bulk on both sides to smooth both surfaces. It is undesirable to give up bulk according to the ’142 Patent, which does not include any examples of heating both sides of a paperboard substrate. *Gratton* is the epitome of what *Papermaking* describes, “[h]eating up both nip rolls, however, is complicated because the other roll is a deflection-compensated roll. Because of the benefits of soft-calender technology, this kind of calendering has remained very rare in spite of the amount of research work done.” (*See Ex. 1005*, p. 40). *Gratton* is such research work.

65. The rest of ¶70 in the Zotterman Declaration discusses how some paperboard grades could benefit from hot calendering on both surfaces. Zotterman has failed to mention the drawback of calendering both surfaces. I

will state that drawback: calendering both surfaces gives up bulk and increases density, versus only hot-calendering one surface—and this is contrary to the drive for lower density, higher bulk paperboard explained in the '142 Patent.

66. Rather than base construction for “counter roller” upon the plain and ordinary meaning as apparent from the intrinsic record, the Zotterman Declaration at ¶70 prefers to rely upon *Gratton*, and upon his own unsupported statements about some paperboard grades. My construction of “counter roller” does not erode the plain and ordinary meaning, and does not contradict the intrinsic evidence with extrinsic evidence as do the Petitioner’s and Zotterman’s claim constructions of “counter roller.”

VII. SUMMARY OF THE PRIOR ART

67. The Petition and the Zotterman Declaration assert various art patents and publications. I have reviewed and considered each of these, along with the materials in Appendix 2 of the Zotterman Declaration that are not asserted *per se*, namely *Crotogino* and *Paperboard Examples*. In addition, I have also reviewed one prior art reference for which the Petition and the Zotterman Declaration failed to account, namely *Mohan*.

A. *Fugitt*

68. *Fugitt* is a patent application about coatings for paperboard. *Fugitt* discloses a method for coating dry finish paperboard. (*See generally*, Ex. 1004). *Fugitt* explains the relationship between basis weight and density determines stiffness, i.e., that generally stiffness increases with basis weight. (*Id.* at [0003]-[0005]). However, increasing basis weight means adding fiber material, which adds to cost. (*Id.*). Thus, in order to increase stiffness without increasing the basis weight, density can be reduced. (*Id.*) One objective in *Fugitt* is to reduce density loss, expressed as avoiding reduction in caliper thickness, to maintain stiffness without the increased cost of adding fiber to achieve stiffness through increasing basis weight. (*Id.* at [0026]). Another objective in *Fugitt* is to provide surface smoothness. (*Id.* at [0005]).
69. Smoothness and stiffness are both desirable for printing. Smoothness allows for high resolution printing. Normally, smoothness is achieved by reducing caliper thickness, i.e., by compacting the paperboard as in newsprint and glossy paper used for books. However, compacting paperboard makes the paperboard less stiff. Flimsy paperboard tends to foul paperboard printers. Therefore, in *Fugitt*, the goal is to improve smoothness without sacrificing stiffness by using coatings on the paperboard surface. (*Id.*). *Fugitt* does not provide a numerical range of nip loads beyond an indication that nip loads

and number of nips in the steam headed calender can be reduced. (Ex. 1004, [0026]). The equation for stiffness is:

$$S = kEc^3$$

where S = Stiffness, E = Young's modulus of elasticity, and c = Caliper. As I will explain in greater detail below, European mills and those in other regions of the world cannot achieve the needed stiffness (resistance to bending) with a single ply sheet.

70. *Fugitt* paragraph [0025] indicates the use of a dry stack calender instead of a wet stack calender, and paragraph [0026] indicates the rolls of the dry stack calender can be steam heated. That being said, *Fugitt* is primarily a document about coatings, whereas the '142 Patent is more about calendering. Despite this difference, it is my opinion that what attracted the attention of the Examiner to *Fugitt*, and also the interest of the Petitioner, is Example 3 in *Fugitt*. Example 3 is the only place in *Fugitt* (or in any of the prior art) where there is an example of a paperboard structure that falls under the Y₂ curve of Claim 1 of the '142 Patent.
71. On its face, Example 3 of *Fugitt* discloses a paperboard structure with a PPS 10S smoothness of 1.5 microns which is in the sub 3 micron range for PPS 10S smoothness of Claim 1, and that falls under the Y₂ curve for basis weight in Claim 1. Equation 1 in Claim 1 of the '142 Patent is:

$Y_2=3.71+13.14X-0.1602X^2$, and in the case of Example 3 in *Fugitt*, $X=12$ so $Y_2=138.3$, where the units of Y_2 are lbs/3000 ft².

72. Claim 1 recites that the paperboard structure has a basis weight at most Y_2 , so for *Fugitt* to read on Claim 1, *Fugitt* needs a paperboard with a basis weight below 138.3. The paperboard structure in Example 3 of *Fugitt* has a stated basis weight of 130.0 lbs/3000 ft², which is less than 138.3 lbs/3000 ft². Therefore, on its face, Example 3 of *Fugitt* falls under the Y_2 curve of Claim 1.

B. *Papermaking*

73. *Papermaking* is a Finnish textbook or handbook-style treatise in English from 2010 (within a year of the publication of *Fugitt*), published as an update to an earlier edition from 1998-2000. (See Ex. 1005, pp. 2-3). *Papermaking*, which is an update of the original edition, is likely to be the largest and most comprehensive book series in the field of papermaking but I question whether it is universally considered to be the most authoritative textbook on papermaking. It is written from a European perspective and does not necessarily reflect the state of the art in USA especially in discussion of paperboard where the Patent Owner and other producers make single ply coated bleached (SBS) board – a product that is not manufactured in Europe. European folding carton board (FBB) is a multi-ply sheet with

mechanical pulp middle ply, which I describe in more detail below. The chapter of *Papermaking* that the Petition relies upon is organized in relevant part as follows. First there is an overview of calendering, the process of compressing a web of paper during its manufacture. (*See* Ex. 1005, pp. 14-35). Then there is an explanation of different kinds of papermaking calenders. (*Id.* at pp. 35-67). There is an explanation of applications for calendering, wherein various types of paper products are discussed with respect to the types of calenders used for making the same. (*Id.* at pp. 67-99). Finally, the relevant chapter of *Papermaking* ends with a discussion of construction consideration for making the various types of calenders. (*Id.* at pp. 84-99).

74. *Papermaking* lists various types of calenders including: hard-nip calenders, two-roll hard-nip calenders, soft calenders, gloss calenders, two-roll soft calenders, three-roll soft calenders, supercalenders, multi-nip calenders, Janus calenders, OptiLoad calenders, ProSoft calenders, show-nip calenders, metal belt calenders, wet stack calenders, breaker stack calenders, friction calenders, and embossing calenders. (*Id.* at pp. 35-67). *Papermaking* lists calendering methods for various applications for calenders including: newsprint, SC paper, coated wood containing paper grades, woodfree uncoated papers, woodfree coated papers, containerboards, uncoated liquid

packaging board, and release and coated label paper. (*Id.* at pp. 67-84).

Papermaking lists consideration for construction of various types of calenders at pages 84-99.

75. USA mills are the world's only producer of single ply coated SBS board. Three species of pine – Loblolly pine, slash pine, and long leaf pine—grow only in the southeast USA. These three species have thicker cell walls (4 – 11 µm) than the softwoods that grow in the Nordic countries (2 - 4 µm) where *Papermaking* was published. Southern US hardwood species including white oak and sweet gum have cell wall thickness of 5 - 8µm compared to birch and aspen at 2 - 3 µm. Stiffness is a critical property in folding cartons and other rigid packaging. The equation for stiffness is:

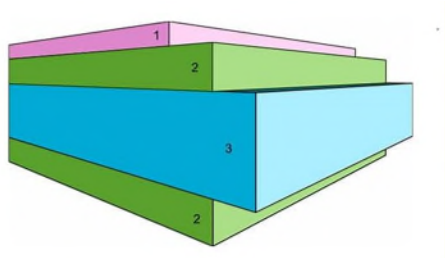
$$S = kEc^3$$

where S = Stiffness, E = Young's modulus of elasticity, and c = Caliper.

European mills and those in other regions of the world cannot achieve the needed stiffness (resistance to bending) with a single ply sheet. European mills including those of the Petitioner do not make single-ply coated SBS.

They make a grade called FBB (Folding boxboard) that is a 3-ply sheet with kraft pulp top and bottom plies and a mechanical pulp middle ply, as shown below, where the numbered layers are identified below the image.

FBB – Folding Boxboard



1 – Pigment coating

2 – Bleached kraft pulp – top ply

3 – Mechanical pulp – middle ply

2 – Bleached kraft pulp – bottom ply

The mechanical pulp in the middle ply provides bulk for stiffness, but it reacts differently to conventional and hot hard calendering than a single ply coated SBS sheet.

76. At the time of the invention, hot hard nip calendering with only one roll heated was not in use in coated paperboard mills in the temperature ranges in the '142 Patent. There was use of soft nip calenders and gloss calenders with only one roll heated for finish calendering after coating but no use of a hot hard calender with only one roll heated to an elevated temperature for pre-calendering prior to coating, and the use of a hot hard nip calender with only one roll heated to the elevated temperature was neither known nor obvious to one of ordinary skill in the art.

C. Gratton

77. *Gratton* is a January 1988 article in the TAPPI Journal. It compares temperature gradient (“TG”) calendering at 210 °C with more conventional calendering at 50 °C. (Ex. 1006, p. 82). In both cases, both rolls were heated to the same temperature. (Ex. 1006, Fig. 1). That is to say in the 210 °C case, both rolls were heated to 210 °C, so the paper web was heated on both sides. (*Id.* at p. 82). There is no thermo-roller versus counter roller in *Gratton* as there is in the ’142 Patent. *Gratton* is a research paper typical of the research work referred to in *Papermaking*, “[h]eating up both nip rolls, however, is complicated because the other roll is a deflection-compensated roll. Because of the benefits of soft-calender technology, this kind of calendering has remained very rare in spite of the amount of research work done.” (*See* Ex. 1005, p. 40).
78. It appears that the authors of *Gratton* believed their innovation was to reduce the number of nips the web had to pass through by heating the one nip in the TG calendering to 210 °C, to obtain better final properties, i.e., the roller temperature and the number of nips appear to be the only meaningful difference between TG and conventional calendering. (Ex. 1006, p. 86). Notably, the nip loads used in both TG and conventional calendering were in the same range, i.e. 20, 40, 60, 80, and 100 kN/m. (*Id.*)

79. It is worth noting that based on the Table II of *Gratton*, *Gratton* is not in the same class as *Fugitt* or the '142 patent in terms of basis weight, thickness (caliper), or Parker Print-Surf (S10) smoothness. For basis weight (where less is better), *Gratton* ranges from 358 g/m² to 381 g/m², whereas *Fugitt*'s Example 3 is at 130.0 lbs/3000 ft² (which converts to 211.6 g/m²) and the basis weight in Claim 1 at *Fugitt*'s caliper thickness (using the equation in Claim 1) is 138.3 lbs/3000 ft² (which converts to 225.1 g/m²). (Ex. 1006, p. 84; Ex. 1004, [0057]). For thickness (caliper) *Gratton* ranges from 0.522 mm to 0.716 mm,¹ whereas *Fugitt*'s Example 3 is at a caliper thickness of 12 points, which converts to 0.3048 mm, and the examples in the '142 Patent range from 10.3-15.5 points, which converts to 0.261-0.3937 mm. (Ex. 1006, p. 84, Ex. 1004, [0057]; Ex. 1001, col. 11-12 Table 2). Finally for smoothness Parker Print-surf (S10) (where less is better), *Gratton* ranges from 4.17 to 8.32 microns, whereas Claim 1 recites at most 3 microns, and Example 3 in *Fugitt* yielded 1.5 microns. (Ex. 1006, p. 84, Ex. 1004, [0057]; Ex. 1001, col. 11-12 Table 2). Both *Fugitt* and the '142 patent seriously outclass *Gratton* where the examples are for a much thicker, heavier,

¹ There is clearly a typographical error in *Gratton* because the caliper numbers are off by a factor of 1,000. Perhaps the millimeters (mm) were intended to be stated as nanometers (nm), i.e. "n" in "nm" was transposed to "m". In my comparison of *Fugit* and the '142 Patent above, I am correcting for *Gratton*'s error.

rougher paperboard. In the foregoing metrics, *Fugitt* and the '142 Patent both outclass *Gratton* by so great a margin, it leads me to conclude that *Gratton* is not a likely source from which one of ordinary skill in the art would draw to try to improve over *Fugitt* to arrive at what is claimed in the '142 Patent.

D. *Papermaking II*

80. *Papermaking II* is an excerpt dated to 2000 from the same series of books as *Papermaking*. The excerpt relates to board coating for containerboard and linerboard, and includes mention of carrier board, liquid board, boxboard, and solid bleached sulphate ("SBS"). (*See generally* Ex. 1007). The first paragraph of Section 2.1 indicates there is a size press before coating, and states that low-consistency starch is applied on the board surface in association with the size press. (Ex. 1007, p. 583).
81. I note that I was the book reviewer for the volume from which *Papermaking II* was excerpted. My name appears on Page 2 of Exhibit 1007 accordingly.

E. *Mohan*

82. *Mohan* was granted as U.S. Patent No. 6,274, 001 on August 14, 2001 to inventor K. Krishna Mohan and Assignee, International Paper Company of Purchase, New York. Mohan is cited on the face of the '142 Patent and is discussed throughout this declaration because it is cumulative to the asserted

art *Papermaking*, *Gratton*, and *Papermaking II*. *Mohan* describes a calendering method which enhances the smoothness for paper/paperboard by a combination of temperature and moisture gradient calendering. (See Ex. 2001, Abstract). Of particular relevance is the second multi-roll calender stack 22, shown in Fig. 2B. (See, *id.* at 4:23-45). *Mohan* teaches that the heated rolls of the calender stack 22 can be heated to a roll surface temperature of 250-400 °F, and that these temperatures can be attained by induction heaters, internal steam, oil, or other heating fluids, or using internal induction coils. (*Id.* at 4:45-57). *Mohan* describes modifications for smoothening one or both sides of a paper web. (*Id.* at 5:41-55). The nip loads contemplated in *Mohan* range from 100 to 1500 pli. (*Id.* at 5:64-65).

83. Based on my review and analysis of the materials cited herein, the Petition, the Zotterman Declaration, my opinions regarding the skill level of a person of ordinary skill in the art at the time of filing the application for '142 Patent (2019), and my training and experience, it is my opinion that a person skilled in the art would not consider the asserted references, based on the grounds set forth in the Petition, as disclosing or suggesting the challenged Claims of the '142 Patent. Nor would such a skilled person be motivated to combine the asserted references in the manner set forth in the Petition.

VIII. PETITIONER'S OBVIOUSNESS GROUNDS

84. In this section, I compare the claims of the '142 Patent to the disclosure of the materials cited herein and present my analysis for the patentability of the challenged claims. Based on my review and analysis of those materials, my opinions regarding the understanding of a person of ordinary skill in the art in the 2019 timeframe, and my training and experience, it is my opinion that it would not have been obvious to a person of ordinary skill in the art to arrive at Claims 1, 2, and 4-23 of the '142 Patent. The reasons for this conclusion are explained below.

A. Ground 1: Claims 1, 2, and 5-23 are not Obvious Under 35 U.S.C. § 103 over *Fugitt* in view of *Papermaking* or *Mohan*

85. In my opinion, *Fugitt* and *Papermaking* (or *Mohan*) do not describe each and every element recited in Claims 1, 2, or 5-23 of the '142 Patent, and it would not be obvious to one of ordinary skill in the art to combine *Fugitt* and *Papermaking* (or *Mohan*) to arrive at the features claimed.

1. Claims analysis

86. In the sections below, I provide my response to the feature-by-feature analysis in the Petition and Zotterman Declaration.

a. Claim 1

87. The Petitioner contends *Fugitt* discloses hot-hard calendering because the dry stack calender 36 in *Fugitt* may be steam heated. (Pet., pp. 30-31; *see*

also Ex. 1004, [0026]). Based on the proper construction of the claim term “hot-hard calender” outlined above, it is my opinion that *Fugitt* does not disclose hot-hard calendering because *Fugitt* states that the rolls (plural) of the calender may be steam heated. (Ex. 1004, [0026])).

88. The Petitioner argues that *Fugitt* discloses a thermo-roller, and indicates the roller arranged opposite the thermo-roller in *Fugitt*’s dry stack calender acts as a counter roller. (Pet., p. 31). I disagree to the extent that the Petition is implying the counter-roller in *Fugitt* is not heated. It is heated, because as pointed out above *Fugitt* indicates the rolls (plural) can be heated. (Ex. 1004, [0026]).
89. *Fugitt* and *Papermaking* fail to disclose a hot-hard calender as recited in Claim 1. Nor does the Petitioner explain whether the supposed hot-hard calender is taken from *Fugitt* or from *Papermaking*, or exactly how the Petitioner believes *Papermaking* and *Fugitt* combine to account for each and every element recited in Claim 1.
90. This leaves me having to assume the supposed ground for obviousness of Claim 1 is based on in *Fugitt* and *Papermaking*. I assume, for sake of argument, that the Petitioner intended to rely upon *Fugitt* for all of the elements of Claim 1 except for the contact surface of the thermo-roller being heated to an elevated temperature of at least 250 ° F, and for this one

element of Claim 1 that *Fugitt* is missing, the Petitioner is citing *Papermaking* to fill in the gap. Specifically, the Petitioner cites to *Papermaking*, page 82 (which gives a roller temperature of 200 °C, 392 °F) and page 98 (which gives a roller temperature of 220 °C, 428 °F) (Ex. 1005, pp. 82; Ex. 1010, p. 98).

91. Specifically, I assume, for sake of argument, that the Petitioner is arguing it would be obvious to raise the roller temperatures in the *Fugitt* process to the 392-428 °F levels stated on page 82 and page 98 of *Papermaking*. But in my opinion it would not have been obvious to use calender roll temperatures of 392-428 °F in the *Fugitt* process to arrive at the paperboard product recited in Claim 1, regardless of whether the roller temperature teaching is abstracted from *Papermaking*.
92. The temperature of at least 250 °F recited in Claim 1 is only one part of the full context of what is recited in Claim 1. Also recited in Claim 1 is a paperboard structure with a Parker Print Surf (PPS 10S) smoothness being at most 3 microns, and a polynomial relationship between basis weight Y_2 as a function of caliper thickness X . (Ex. 1001, 12:32-53). It is not to be expected that simply turning up the temperature in the calender stack of *Fugitt* to the 392-428 °F temperatures disclosed in *Papermaking* would result in a

paperboard structure having the smoothness together with the relationship of basis weight Y_2 as a function of caliper thickness as recited in Claim 1.

93. In fact, as pointed out by the Petitioner, the paperboard products disclosed in *Fugitt* attained the smoothness and basis weight Y_2 as a function of caliper thickness as is, i.e., without the modification of raising the roller surface temperatures up to 392-428 °F as stated in *Papermaking* or *Mohan*. (Pet., pp. 35-36). Turning up the heat in the *Fugitt* process to temperatures as high as 392-428 °F would have overshoot the basis weight Y_2 as a function of caliper thickness recited in Claim 1, meaning the resulting paperboard product would fail to reach the area below the Y_2 curve recited in Claim 1. The Petitioner's proposed combination of the method in *Fugitt* and the temperatures in *Papermaking* would have overheated and/or over-compressed the paperboard product to be inferior in terms of the basis weight as a function of caliper thickness—inferior both to what is recited in Claim 1, and to what was listed in Example 3 of *Fugitt*. This effect is exacerbated by the fact that the calender 36 in *Fugitt* is a calender stack that ultimately heats the paper web on both sides. (Ex, 1004, [0026] and Fig. 11). Heating both sides of the paper web in *Fugitt* to at least 392-428 °F would lead to an undesirable loss of bulk on both sides of the web.

94. Those of ordinary skill in the relevant art, i.e., the papermaking art, are aware of the many factors that go into creating a specific paper product. Some of these factors include nip loading, i.e., how much force is applied to press the paper web passing between two rollers, how many nips to pass the web through, temperatures of the rollers in any calenders, additives such as starch used in the sizing rollers, whether moisture is added in the calendering process, what kind of coatings to apply, and the like. If one of ordinary skill in the art desires to change one of these factors, e.g., the roller temperature in the *Fugitt* process, he or she knows that such an alteration can completely change the paper product coming out of the process. One change, such as changing the roller temperature, can lead to a cascade of other changes needed to avoid unwanted effects on the paper product output. For these reasons, it would not be obvious to merely change the roller temperature in *Fugitt* as the Petitioner has alleged.
95. Modifying the roller temperature in the *Fugitt* process to the levels disclosed on pages 82 and 89 of *Papermaking* would have reduced the caliper thickness, rendering the *Fugitt* paper product inferior to what was actually disclosed in *Fugitt*. The alternative to losing this caliper thickness would have required any number of other changes in the *Fugitt* system to try to compensate for the negative effects of the increased roller temperature,

which other changes the Petitioner has not explained. Such other changes, if proposed, would be made with reliance upon impermissible hindsight reasoning taking into account information gleaned only from the '142 Patent itself.

96. Another reason it would not be obvious to one of ordinary skill in the art to turn up the temperature in the *Fugitt* process is because doing so would be costly. The energy costs of using temperatures as high as those taught in *Papermaking* would have been considerably higher than the energy costs in the unmodified process of *Fugitt*. Therefore, the Petitioner's proposed combination would significantly increase production costs in order to yield an inferior paperboard product to what the unmodified system in *Fugitt* could attain, if Example 3 in *Fugitt* is taken at face value. The combination of *Fugitt* with *Papermaking* would not be an obvious alteration for one of ordinary skill in the art, nor would it be an obvious thing to try. The Examiner must have appreciated in view of the totality of the art, and the full context of Claim 1, that it is not feasible to simply take a roller temperature out of context, e.g., from *Papermaking* or the traditional papermaking processes the Examiner cited in the rejection of original Claim 3, to modify *Fugitt* in the manner suggested by the Petitioner. The same reasoning can readily be applied to *Mohan*, the reference cited on the face of the '142

Patent that is cumulative to *Papermaking*. It would not have been obvious to use the 250-400 °F temperature disclosed in *Mohan* for the process described in *Fugitt* for the same reasons given above with respect to *Papermaking*.

97. In addition to proposing to simply change the roller temperature in *Fugitt*, the Petition makes a passing mention of a substitution of the single heated hard nip calender in *Papermaking* for the calender stack in *Fugitt*. (Pet., p. 37-38). Even if one were to consider combining the one-nip heated calender of page 82 of *Papermaking* to replace the calender stack in *Fugitt*, there are problems with the combination. The single nip heated calender on *Papermaking* page 82 is only one of several options listed, and according to the Figure 63 on page 81 of *Papermaking*, it does not obtain the benefits of hot soft nip or metal belt calendering. (See Ex. 1005, pp. 81-82, where the upper right corner in the chart of Fig. 63 shows better bulk/smoothness quality). Moreover, the pre-calendering section 4.4.2 of *Papermaking* does not provide any specific examples of bulk (caliper thickness and weight) or smoothness, nor does the Petitioner explain how substituting the single nip heated precalender from Section 4.4.2 of *Papermaking* for the calender stack in *Fugitt* would still provide a paperboard structure meeting the smoothness and caliper/basis weight equation recited in Claim 1.

98. The Zotterman Declaration at ¶ 111 attempts to make a case that the temperature in Claim 1 is a matter of routine optimization. I disagree completely. Zotterman has isolated the temperature of 250 °F out of the context of the rest of the elements of Claim 1, ignoring the Y₂ curve recited in Claim 1. I have already explained above that one cannot simply change the temperature without having other effects on the system.
99. But there is another issue: modifying the process in *Fugitt* to run at over 250 °F, one must still attain a paperboard structure with properties under the Y₂ curve as recited in Claim 1. The Petitioner and Zotterman have not proven that altering the temperature in *Fugitt* would still result in properties under the Y₂ curve as recited in Claim 1. I believe that at its face value, Example 3 of *Fugitt* describes a process resulting in a paperboard structure that has properties below the Y₂ curve of Claim 1. I believe that significantly increasing the temperature used in that *Fugitt* process as proposed by the Petitioner and Zotterman would alter the properties of Example 3's paperboard structure in *Fugitt*, reducing its bulk and placing it above the Y₂ curve and outside the scope of Claim 1. The Petitioner has not shown otherwise.
100. So if I take *Fugitt* at face value, the combination of *Fugitt* and *Papermaking* would not render Claim 1 obvious for the reasons I have given above. The

foregoing demonstrates that *Fugitt* and *Papermaking* would not have rendered Claim 1 obvious to one of ordinary skill in the art at the time of filing the application for the '142 Patent.

101. Since *Mohan* is cumulative to *Papermaking* with respect to the temperature issue, *Fugitt* and *Mohan* would not have rendered Claim 1 obvious to one of ordinary skill in the art at the time of filing the application for the '142 Patent. Since the combination of *Fugitt* with *Papermaking* or *Mohan* would not have rendered Claim 1 obvious, the Petitioner's Ground 1 is incorrect. Therefore, it is my opinion that the Examiner did not err by not rejecting the claims in view of the combination of *Fugitt* with *Mohan*, or *Papermaking*. It is also my opinion that the arguments presented by the Petitioner on this point are cumulative to the information the Examiner already considered when the Examiner considered *Mohan* during prosecution of the '156 application.

102. In my opinion, Claim 1 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

b. Claim 2

103. Claim 2 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 2. In addition, there are the following inadequacies in the Petition with respect to Claim 2.

104. The Petition indicates 10 to 40 kN/m converts to 3.5 to 88 pli. This is an incorrect unit conversion, and it should be stated that 10 to 40 kN/m converts into 57.1 to 228.6 pli, because $3.5 \text{ kN/m} = 20 \text{ pli}$. The Petitioner's conversion error is also in the Zotterman Declaration at ¶119. (Ex. 1003, ¶119).
105. Claim 2 recites a nip load ranging from about 20 pli to about 500 pli. (See Ex. 1001, Claim 2). With the correct unit conversion in mind, *Papermaking* discloses nip loads ranging from 57.1 to 228.6 pli, which is not stated as being particularly relevant to cartonboard. (See Ex. 1005, p.72). Additionally, *Papermaking* gives a nip load value that can be exceeded (571 pli) on page 82, which may be relevant to cartonboard, but this is wholly outside the range recited in Claim 2.
106. The Petitioner has cherry picked numerical values from *Papermaking* out of context and has made unit conversion errors in their own favor. The combined effect of these improprieties is to make it appear as though the range in Claim 2 (20-500 pli) is bracketed by a value of 3.5 pli at the low end, and a higher value of 571 pli.
107. Reality is not so bleak. In reality the values on page 72 of *Papermaking* are not particularly relevant to cartonboard but instead are relevant specifically to coated wood-containing paper grades. The numbers the Petitioner took

from *Papermaking* page 72 are from the wrong context with respect to the range recited in Claim 2.

108. The 571 pli value from *Papermaking* page 82 is stated as particularly relevant to cartonboard. However, in this case the range is 571 pli or more, i.e., linear loads may exceed this value according to *Papermaking*. (Ex. 1005, p. 82). The relevant range of 571 pli and higher is completely outside of the range recited in Claim 2. While *Papermaking* page 82 may be the right context, it is the completely the wrong range.
109. In view of the foregoing, and in addition to the reasons already given above with respect to Claim 1, *Papermaking*, *Mohan*, and *Fugitt* do not render Claim 2 obvious. In my opinion Claim 2 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

c. Claim 5

110. Claim 5 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 5.
111. However, it should be noted that as the number of rollers and nips is implicated in Claim 5, the Petitioner cannot apply to Claim 5 the version of their argument where the calender stack in *Fugitt* is simply raised to over 250 °F. This is because too many rolls are heated in *Fugitt* given the claim

terms are properly construed to have only one roller heated to the elevated temperature. The Petitioner also cannot apply the version of their argument where the two-roll calender from *Papermaking* replaces the calender stack in *Fugitt* because the two-roll calender in *Papermaking* only has two rolls, not three as recited in Claim 5.

112. In view of the foregoing, and in addition to the reasons already given above with respect to Claim 1, *Papermaking*, *Mohan*, and *Fugitt* do not render Claim 5 obvious. In my opinion Claim 5 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

d. Claim 6

113. Claim 6 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 6. In my opinion Claim 6 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

e. Claim 7

114. Claim 7 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 7. In my opinion Claim 7 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

f. Claim 8

115. Claim 8 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 8. In my opinion Claim 8 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

g. Claim 9

116. Claim 9 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 9. In my opinion Claim 9 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

h. Claim 10

117. Claim 10 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 10. In my opinion Claim 10 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

i. Claim 11

118. Claim 11 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 11. In my opinion Claim 11 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

j. Claim 12

119. Claim 12 depends from Claim 11, therefore the same arguments provided above with respect to Claim 1 and Claim 11 also apply to Claim 12. In my opinion Claim 12 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*. I note that although the Petitioner cited to ¶40 in *Fugitt* with respect to Claim 12, they appear to have meant ¶30. (Pet., p. 46).

k. Claim 13

120. Claim 13 depends from Claim 11, therefore the same arguments provided above with respect to Claim 1 and Claim 11 also apply to Claim 13. In my opinion Claim 13 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*

l. Claim 14

121. Claim 14 depends from Claim 13, therefore the same arguments provided above with respect to Claim 1 and Claim 13 also apply to Claim 14. In my opinion Claim 14 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

m. Claim 15

122. Claim 15 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 15. In addition, the

Petitioner relies upon *Fugitt*, [0044], which disclosed 50:50 clay to calcium carbonate, but the Petitioner has not explained how this number correlates to the range of 10-60 percent ground calcium carbonate by weight, as recited in Claim 15. (Pet., pp. 47-48). In my opinion Claim 15 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

n. Claim 16

123. Claim 16 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 16. In my opinion Claim 16 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

o. Claim 17

124. Claim 17 depends from Claim 16, therefore the same arguments provided above with respect to Claim 1 and claim 16 also apply to Claim 17. In my opinion Claim 17 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

p. Claim 18

125. Claim 18 depends from Claim 16, therefore the same arguments provided above with respect to Claim 1 and Claim 16 also apply to Claim 18. In my

opinion Claim 18 would not have been obvious to one having ordinary skill in the art in view of *Fugitt, Papermaking*, and *Mohan*.

q. Claim 19

126. Claim 19 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 19. In my opinion Claim 19 would not have been obvious to one having ordinary skill in the art in view of *Fugitt, Papermaking*, and *Mohan*.

r. Claim 20

127. Claim 20 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 20. In my opinion Claim 20 would not have been obvious to one having ordinary skill in the art in view of *Fugitt, Papermaking*, and *Mohan*.

s. Claim 21

128. Claim 21 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 21. In my opinion Claim 21 would not have been obvious to one having ordinary skill in the art in view of *Fugitt, Papermaking*, and *Mohan*.

t. Claim 22

129. Claim 22 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 22. In my opinion Claim

22 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

u. Claim 23

130. Claim 23 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 23. In addition, the Petition cites to Example 3 in *Fugitt*, which yielded a paper produce with a caliper thickness of 12 points. (Pet., pp. 53-54). Calculating the value of Y_3 in Claim 23 using 12 basis points as the value for X yields 128.7. But Example 3 in *Fugitt* yielded a basis weight of 130.0, which is greater than 128.7 and therefore lies outside the range recited in Claim 23. (Ex. 1004, [0057]). In order to lower the basis weight of *Fugitt* Example 3, the Petitioner has arbitrarily added 1.6% to the caliper points, which appears to be the epitome of hindsight reasoning, and to defeat the claim differentiation to which the Patent Owner is entitled among Claims 1, 21, 22, and 23. There is a similar problem in the Zotterman Declaration, where Zotterman attempts to bring in a folding boxboard (“FBB”) example discussed in *Papermaking*, deriving 2.0 PPS s10 smoothness and bulk of 1.7 cm³/g. (Ex. 1003, p. 56). Zotterman associates a caliper of 14.2 points to this FBB example, but never cites any source for that 14.2 points figure, and it is not in *Papermaking* Fig. 62 or the associated text. It cannot therefore be given any weight. In view of

the foregoing, in my opinion Claim 23 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, and *Mohan*.

2. Non-obviousness of combining features

131. As explained above, I am not an attorney, and I offer no opinions of law in this declaration. But counsel for the Patent Owner has informed me of the legal standards that apply to the issue of obviousness, as I explained above. Based on this understanding, it is my opinion that it would not have been obvious to one of ordinary skill in the art to combine *Fugitt* and *Papermaking*, nor would one of ordinary skill in the art have been motivated to combine *Fugitt* and *Papermaking*, to arrive at Claims 1, 2, and 5-23 of the '142 Patent. I can say the same for the combination of *Mohan* and *Papermaking*, since *Mohan* is cumulative to *Papermaking*.
132. If I take *Fugitt* at face value, the paperboard product in *Fugitt* Example 3 met the Y₂ range recited in Claim 1 without the elevated roller temperature (at least 250 °F) recited in Claim 1. One of ordinary skill in the art would have known changing the formula used to attain that Example 3 paperboard product, by substantially raising the roller temperature to the levels taught in *Papermaking* (or *Mohan*), would have had an effect on paperboard product coming out of the *Fugitt* process. The Petitioner has failed to explain how the altered paperboard product from changing the roller temperature in

Fugitt Example 3 would still nonetheless fall on the correct side of the Y₂ curve recited in Claim 1. I opine that such an alteration would have reduced the caliper relative to Example 3 of *Fugitt*, and I see no expectation of success that the caliper in *Fugitt* Example 3 could have been preserved at the temperatures taught in *Papermaking* or *Mohan*.

133. It is my opinion that regardless of whether the teaching of at least 250 °F is derived from *Papermaking* or *Mohan*, it would not be obvious to use temperatures of at least 250 °F in the system of *Fugitt*. And aside from *Fugitt*'s Example 3, there is nowhere else in the art of record, including all of the Petitioner's asserted art, that discloses a paperboard structure made by a roller surface temperature of at least 250 °F with properties that fall below the Y₂ curve recited in Claim 1. Therefore in my opinion, Claim 1 and all of its dependent claims are non-obvious to those having ordinary skill in the art.

B. Ground 2: Claims 1, 2, and 4 are not obvious under 35 U.S.C. § 103 over *Fugitt* in view of *Papermaking*, *Mohan*, or *Gratton*

134. In my opinion, *Fugitt* combined with *Papermaking* and *Gratton* (or *Mohan*) do not describe each and every element recited in Claims 1, 2, or 4 of the '142 Patent, and it would not be obvious to one of ordinary skill in the art to

combine *Fugitt* and *Papermaking* and *Gratton* (or *Mohan*) to arrive at the method claimed.

1. Claim-by-claim analysis

135. In the sections below, I provide my response to the feature-by-feature analysis in the Petition and Zotterman Declaration.

a. Claim 1

136. The deficiencies in the combination of *Fugitt* and *Papermaking* with respect to Claim 1 have already been established above with respect to Grounds 1. *Gratton* does not remedy the deficiencies in disclosure in the combination of *Fugitt* and *Papermaking*. It is pointed out above that properly construed, the counter-roller or rollers in Claim 1 are not heated to the elevated temperature. In *Gratton*, both rollers are heated to an identical temperature. (Ex, 1006, Fig. 1; p. 86).

137. The Petitioner uses *Gratton* for its teaching of a roller temperature of 210 °C, which is cumulative to the teachings of *Papermaking* itself. It has been pointed out above that the temperature cannot simply be extracted from *Papermaking* and injected into *Fugitt* without reference to the equation in Claim 1, and the same applies to *Gratton*. The unmodified version of *Fugitt* (Example 3) already achieved a paperboard product having the Y_2 equation's quality if we take Example 3 at face value. The Petitioner has not

provided any evidence that a product having the same quality would be possible if *Fugitt* is modified with the extra heat in the combination of *Papermaking* and *Gratton*. Where Claim 1 and *Fugitt* both outclass *Gratton* on every metric, it would not be obvious to modify *Fugitt* with *Gratton* in the manner suggested by the Petitioner because the extra heat would downgrade the paperboard structure of *Fugitt* Example 3 out of the Y₂ area of Claim 1. This would all be in a hindsight driven attempt to arrive at a product in league with *Fugitt* and the equation in Claim 1.

138. There is an additional problem with *Gratton*. The Petition and the Zotterman Declaration argue that the calender 36 in *Fugitt* relates to pre-calendering, before application of the basecoat and topcoat recited in Claim 1. (Pet., pp. 64-65; Ex. 1003, pp. 65-66, ¶¶ 185-186. However, *Gratton*, describes the coating of pigmented starch as occurring in a size press, which Zotterman has declared would of necessity be upstream of the heated rollers shown in Fig. 1 of *Gratton*. (See Ex. 1006, p. 86; Ex. 1003, pp. 65-66, ¶¶ 185-186). The fact that *Gratton* refers to coating before and not after the heated nip, means the heated rolls in *Gratton* are not for pre-calendering. This argues against the combination of *Fugitt* and *Gratton* wherein the Petitioner supposes the post-coating heated nip of *Gratton* could be substituted for the pre-coating calender stack in *Fugitt*.

139. *Gratton* is a research paper typical of the research work referred to in *Papermaking*, “[h]eating up both nip rolls, however, is complicated because the other roll is a deflection-compensated roll. Because of the benefits of soft-calender technology, this kind of calendering has remained very rare in spite of the amount of research work done.” (See Ex. 1005, p. 40). Given the level of one of ordinary skill in the art, it would not have been obvious to use the two-heated rollers of *Gratton* in any practical setting, let alone in combination with *Papermaking* and *Fugitt*. This is especially true since *Papermaking* teaches away from that combination by associating the very rare two-heated-rolls technique of *Gratton* with complications and research work. *Papermaking* clearly teaches instead toward use of soft calendering. One of ordinary skill in the art possessing copies of *Fugitt*, *Papermaking*, and *Gratton* would ignore the teaching of *Gratton* and follow the suggestion in *Papermaking* to use a soft calendering technique, which is not relevant to Claim 1.
140. With respect to *Mohan*, it has already been discussed in combination with *Papermaking* above. The same reasoning provided in the grounds above also apply here to the grounds based on *Gratton*. In view of the foregoing, Claim 1 is not obvious over *Fugitt*, *Papermaking*, *Mohan*, and *Gratton*. In my

opinion, Claim 1 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, *Gratton*, and *Mohan*.

b. Claim 2

141. Claim 2 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 2. In addition, on this ground, the Petition relies upon *Gratton* for the claimed nip load range. (Pet., pp. 63-64). I do not agree that *Gratton* discloses nip loads ranging from 20 pli to 500 pli. The range in *Gratton* is different, ranging from 114.2 pli to 571.0 pli. (Ex. 1006, p. 86). In view of the foregoing, Claim 2 is not obvious over *Fugitt*, *Papermaking*, and *Gratton*. In my opinion Claim 2 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, *Gratton*, and *Mohan*.

c. Claim 4

142. In arguing obviousness under Ground 3 of the Petition, the Petitioner relies upon Ground 1 of the Petition for the underlying features of Claim 4 that are recited in independent Claim 1. (Pet., p. 64). Claim 4 depends from Claim 1, and therefore the same arguments provided herein under Ground 1 with respect to Claim 1 also apply to Claim 4. In my opinion, Claim 4 would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, *Gratton*, and *Mohan*.

2. Non-obviousness of combining features

143. The same reasons I provided above with respect to the non-obviousness of combining *Fugitt* and *Papermaking* (or *Mohan*) also apply to the grounds based on *Gratton*. This is because the Petitioner uses *Gratton* for its teaching of roller temperatures of at least 250 °F, which is problematic for the same reasons it is problematic with respect to *Papermaking*'s teaching of temperatures of at least 250 °F and *Mohan*'s teaching of temperatures of at least 250 °F, as discussed below.
144. It is my opinion that regardless of whether the teaching of at least 250 °F is derived from *Papermaking*, *Mohan*, or *Gratton*, it would not be obvious to use temperatures of at least 250 °F in the system of *Fugitt*. And aside from *Fugitt* Example 3, there is nowhere else in the art of record, including all of the Petitioner's asserted art, that discloses a paperboard structure made by a roller surface temperature of at least 250 °F with properties that fall below the Y₂ curve recited in Claim 1. Therefore, in my opinion, Claim 1 and all of its dependent claims are non-obvious and would not have been obvious to one having ordinary skill in the art in view of *Papermaking*, *Mohan*, and/or *Gratton*.

C. Ground 3: Claim 4 is non-obvious under 35 U.S.C. § 103 over *Fugitt* in view of *Papermaking*, *Papermaking II*, or *Mohan*

145. In my opinion, *Fugitt* combined with *Papermaking* and *Papermaking II* (or *Mohan*) do not describe each and every element recited in Claim 4 of the '142 Patent, and it would not be obvious to one of ordinary skill in the art to combine *Fugitt*, *Papermaking*, and *Papermaking II* (or *Mohan*) to arrive at the method claimed.

1. Claims analysis

146. In the sections below, I provide my response to the feature-by-feature analysis in the Petition and Zotterman Declaration.

a. Claim 4

147. Claim 4 depends from Claim 1, therefore the same arguments provided above with respect to Claim 1 also apply to Claim 4. Specifically, under Ground 1 above, I have already explained the deficiencies of the combinations of *Fugitt*, *Mohan*, *Gratton*, and *Papermaking* with respect to Claim 1. *Papermaking II* does not even discuss with the at least 250 °F temperature range in Claim 1, nor has the Petitioner alleged anything about *Papermaking II* and temperature. (See Pet., pp. 66-67). *Papermaking II* does not remedy the deficiencies of the combination of *Fugitt* and *Papermaking* with respect to Claim 1. Therefore, the combination of *Fugitt*, *Papermaking*, *Mohan*, *Gratton*, and *Papermaking II* does not render independent Claim 1

obvious. For at least the same reasons, dependent Claim 4 is not obvious over *Papermaking*, *Gratton*, *Mohan*, *Papermaking II*, and *Fugitt*

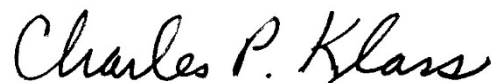
2. Non-obviousness of combining features

148. The same reasons I provided above with respect to the non-obviousness of combining *Fugitt* and *Papermaking* (or *Gratton* or *Mohan*) also apply to the grounds based on *Papermaking II*. This is because the Petitioner does not even use *Papermaking II* for its teaching of roller temperatures of at least 250 °F, let alone any explanation of how the combination would read on the Y₂ curve aspect recited in Claim 1.
149. It is my opinion that regardless of any teaching of *Papermaking II*, and regardless of whether the teaching of at least 250 °F is derived from *Papermaking*, *Mohan*, or *Gratton*, it would not be obvious to use temperatures of at least 250 °F in the system of *Fugitt*. And aside from *Fugitt* Example 3, there is nowhere else in the art of record, including all of the Petitioner's asserted art, that discloses a paperboard structure made by a roller surface temperature of at least 250 °F with properties that fall below the Y₂ curve recited in Claim 1. Therefore, in my opinion, Claim 1 and all of its dependent claims, including Claim 4, are non-obvious and would not have been obvious to one having ordinary skill in the art in view of *Fugitt*, *Papermaking*, *Papermaking II*, *Gratton*, and *Mohan*.

IX. CONCLUSION

150. In my opinion, the asserted references failed to disclose or suggest Claims 1, 2, and 4-23 of the '142 Patent to a person having ordinary skill in the art. I have set forth above why the asserted art is cumulative to the cited art already considered by the Examiner, the asserted arguments are cumulative to those already before the Examiner, and that the Petitioner has not set forth evidence of any material error by the Examiner. I have also set forth above why there is no reasonable likelihood that the Petitioner will prevail on the challenged claims because none of the challenged claims are unpatentable.
151. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of U.S. Patent No. 11,293,142.

Dated: December 21, 2023



Charles P. Klass

APPENDIX 1

Curriculum Vitae

EDUCATION

- Western Michigan University: BA in Mathematics with minors in Pulp & Paper Technology and Chemistry, 1962.
- Pace University: MBA in Marketing Management, 1968 - Thesis: Impact of the Marketing Concept on Management of the Paper Industry; doctoral level course work in strategic planning, finance, organization development, and international business.

EXPERIENCE

- 1986-Present: Klass Associates Inc., Radnor, PA and Madeira Beach, FL - President - Consultant to the pulp and paper industry and affiliated companies: coating and papermaking technology, strategic planning, feasibility studies, value-added grade development, recycled fiber usage, deinking processes, due diligence on acquisitions and mergers, expert testimony and assistance in regulatory approvals.
- 1982-1986: BTG Coating Systems, Dallas, TX/Inventing of America Ltd., King of Prussia, PA - Vice President - Founded and developed North American sales/service subsidiary of Swedish paper coater manufacturer; turned around sales decline; managed acquisition of Dahlgren LAS business and consolidation into fully integrated manufacturer of coating equipment.
- 1978-1981: Asten Group Inc., Devon, PA - Corporate Marketing Director/Director of International Sales - Managed marketing function of supplier of paper machine clothing; coordinated acquisition of French felt manufacturer; developed worldwide sales/service organization.
- 1975-1977: Lockport Felt Division of Carborundum Co., Newfane, NY - General Sales Manager - Managed marketing function of supplier of paper machine clothing including wet press felts and dryer fabrics.
- 1969-1975: Merck Paper Chemicals, Rahway, NJ - Sales Representative/Product Manager/Marketing Manager - Progressed from field sales into marketing management for maker of wet end and coating specialty

chemicals; achieved rapid growth in sales and net income; managed commercialization of two new product lines.

- 1964-1968: Paper Trade Journal, New York, NY - Associate Editor - Edited weekly paper industry trade and technical magazine.
- 1963-1964: Westvaco Corp., Luke, MD - Operating Engineer - Responsible for two paper machines with on-machine coaters.
- 1962-1963: Union Camp Corp., Savannah, GA - Process Engineer - Projects focused on kraft pulping and paper machine optimization.
- 1960-1961: Oxford Miami Paper Co., West Carrollton, OH – Laboratory technician - Projects focused on deinking plant and testing of mill effluents
- 1959-1960: Hamilton Paper Co., Plainwell, MI - Worked night shift as deinking/bleach plant chemist to finance education.
- 1957-1958: Department of Pulp and Paper Technology, Western Michigan University, Kalamazoo, MI – Laboratory and pilot plant technician.

PROFESSIONAL AFFILIATIONS

- Western Michigan University – Adjunct Professor of Chemical & Paper Engineering
- TECHNICAL ASSOCIATION OF THE PULP & PAPER INDUSTRY (TAPPI): Lifetime Member - Served on Board of Directors; former chairman of Paper and Board Manufacture Division and Management Services Division; currently on Coating Process Committee, Papermakers Committee, Basestock Committee, and Publications Committee; chairman and chief instructor of Coating Process Short Course and Marketing Short Course; instructor for Coated Paperboard Course; co-chair and instructor Paper Machine Optimization and Containerboard Manufacture Courses.

PUBLICATIONS

- Numerous publications in technical journals and trade magazines on pulp and paper manufacturing technology, marketing management, technology forecasting, business planning, and human resource development; co-author of paper technology textbooks; frequent speaker and panelist at paper industry technical and business conferences.

PATENTS

- Four issued U.S. patents on papermaking and coating chemicals plus three foreign patents and two published patent applications.

AWARDS AND HONORS

- Paper Industry International Hall of Fame.
- TAPPI Fellow.
- TAPPI Paper and Board Manufacturing Division Award.
- Harris O. Ware Prize for contributions to paper and paperboard manufacture.
- TAPPI Distinguished Service Award.
- TAPPI Coating and Graphic Arts Division Leadership and Service Award
- TAPPI Gunnar Nicholson Gold Medal Award
- Paper Technology Foundation Inc., Western Michigan University
 - Fellow
 - Hall of Fame Award
- Western Michigan University Academy of Engineering Excellence

TRUSTEESHIP

- Paper Technology Foundation Inc., Western Michigan University – Trustee.

CORPORATE BOARD

- Pacific Nano Products, Inc. – Member of the Board of Directors

CIVIL LITIGATION

- Manildra Milling Corp. v. Ogilvie Mills, Inc. v. Henkel Corp. and Henkel of America, Inc. and John Thomas Honan, U.S. District Court, Kansas, Civil Action No. 86-2457-S
 - Appeared for Ogilvie Mills, Inc. - Areas of expertise: carbonless paper, paper coating, paper industry business practices – patent infringement litigation
- Walle Corp. v. Roosevelt Paper Co., U.S. District Court, Eastern District Louisiana, Civil Action No. 91-4497, Section "K" - Magistrate Division 2

- Appeared for plaintiff - Areas of expertise: label paper, suitability of paper for intended use.
- Consolidated Papers, Inc. and J. M. Voith GmbH v. Valmet Paper Machinery et al., U.S. District Court, Eastern District Wisconsin, Civil Action No. 91-C-871
 - Appeared for plaintiff - Expert on paper coating equipment for Consolidated Papers Inc. – patent infringement litigation.
- Oy Wartsila AB, Valmet Paper Machinery Inc., and Valmet Appleton Inc. v. Shoreham Paper Co., International Chamber of Commerce, International Court of Arbitration No. 7013/BGD
 - Appeared for plaintiff - Areas of expertise: papermaking, paper coating, paper industry business practices.
- David Clementz and Lisa Clementz v. The Kohler Coating Machinery Corporation, State of Michigan Circuit Court for the County of St. Joseph, Civil Action No. 96-152-NP
 - Appeared for defendant - personal injury on paper coater.
- Willie Ball v. BTG Coating Systems, Inc. and BE&K Engineering Company, Circuit Court for the Twenty-ninth Judicial Circuit in and for Talladega County, Alabama, Civil Action No. CV-93-443
 - Appeared for defendant - personal injury on paper machine coating section.
- Minnesota Mining and Manufacturing Company v. Beautone Specialties Co., Ltd., and Taiwan Hopax Chemicals Mfg. Co. Ltd., US District Court, Minnesota, Civil Action 98-cv-709
 - Appeared for defendant - claim of color yellow as trademark for sticky notes - Areas of expertise: papermaking, converting of paper products, cost of manufacture, marketing of converted paper products.
- Nuway Paper L.L.C./Oakbrook International v. The Kohler Coating Machinery Corporation et. al., US District Court, Western District of Michigan, Civil Action 99-CV-999
 - Appeared for defendant - Areas of expertise: paper coating, coating equipment, paper industry business practices.
- Robert Lee Bickham, et al. v. Metropolitan Life Insurance Company, et al., Consolidated Matter No. 70,760, 22nd JDC, Div. “E”, Parish of Washington, Louisiana

- Appearing for defendant - asbestos in paper machine dryer felts - Areas of expertise: papermaking, paper machine clothing, dryer section ventilation, paper machine clothing company business practices
- FiberMark, Inc. v. Merrimac Paper Company, Inc., US District Court, District of Massachusetts, Civil Action No. 01-11159 DPW
 - Appeared for plaintiff - Areas of expertise: paper manufacturing, paper industry business practices, printing and imaging – trademark infringement litigation.
- FiberMark, Inc. v. Brownville Specialty Paper Products, Inc., US District Court, Western District of New York, Civil Action No. 02-CV-0517(TJM) (GLS) Appeared for plaintiff - Areas of expertise: paper manufacturing, paper industry business practices, printing and imaging – trademark infringement litigation.
- David Rohs, et al. v. Garlock Inc., et al., Cause No. 21120*BH02-3, 23rd Judicial Court of Brazoria County, Texas
 - Appearing for defendant - asbestos in paper machine dryer felts - Areas of expertise: papermaking, paper machine clothing, dryer section ventilation, paper machine clothing company business practices.
- TST/IMPRESSO, Inc. v. Asia Pulp & Paper Trading (USA), Inc., US District Court, Northern District of Texas, Civil Action No. 3-02CV-2022L
 - Appeared for defendant - Areas of expertise: Paper, suitability of paper for intended use, paper industry business practices.
- Corporación Durango, S.A. and Durango McKinley Paper Company v. Grant Thornton LLP District Court of Harris County Texas, 125th Judicial District, Civil Action No. 2003-65190 – Case withdrawn in Texas and refiled in New Jersey as Superior Court of New Jersey Law Division; Middlesex County Docket No. MID-L-6468-05 Civil Action
 - Appeared for defendant - Areas of expertise: Paper industry business practices, pulp and paper mill maintenance expense and capitalization practices.
- Ciba Specialty Chemicals Corporation v. Hercules, Inc. and Cytec Industries, Inc. US District Court, District of Delaware, Civil Action No. 04-293 (KAJ)

- Appeared for defendant - Areas of expertise: Papermaking chemicals – patent infringement litigation.
- United States Gypsum Company v. Pacific Award Metals, Inc. US District Court, Northern District of California, Civil Action No. C04-04941 FMS
 - Appeared for plaintiff – Areas of expertise: Paper coating – patent infringement litigation.
- 3M Company v. Rollit, LLC et al. US District Court, Northern District of California (San Jose Division), Civil Action No. C06-01225 JW
 - Appeared for defendant - claim of color yellow as trademark for sticky notes - Areas of expertise: papermaking, converting of paper products, cost of manufacture, marketing of converted paper products.
- Appleton Papers Inc. v. Andritz BMB AG and Andritz, Inc., State of Wisconsin: Circuit Court; Outagamie County, Case No. 07-CV-1416
 - Appeared for plaintiff - Areas of expertise: paper coating equipment, cost of cover vis-à-vis turnkey installation.
- HFF International GmbH v. J & A International Resources Inc. and Universal Exports Inc., US District Court, Eastern District of New York, Docket No. 1746-CV-08
 - Appeared for plaintiff – areas of expertise: paper, definition of terms describing stock lots of paper, suitability of paper for intended use
- Appleton Papers Inc. and NCR Corporation v. George A. Whiting Paper Company, et al. US District Court, Eastern District of Wisconsin, Green Bay Division, Case No. 08-CV-00016-WCG
 - Appeared for defendants – areas of expertise: papermaking, paper coating, carbonless paper manufacture, wastepaper grades and utilization, discharge of PCBs into the river.
- Menasha Corporation v. Employers Insurance Company of Wausau (f/k/a) Employers Mutual Liability Insurance Company of Wisconsin, et al. State of Wisconsin: Circuit Court; Winnebago County, Branch 5, Case No. 07-CV-1406
 - Appeared for plaintiff – papermaking, paper coating, carbonless paper manufacture, wastepaper grades and utilization, discharge of PCBs into the river – insurance litigation.
- Thilmany, LLC v. Appleton Papers Inc. State of Wisconsin: Circuit Court; Outagamie County, Branch VI, Case No. 09-CV-2170

- Appeared for plaintiff - Areas of expertise: paper coating, suitability of paper for coating, paper quality and defects.
- Lonza Inc. v. Nalco Company US District Court, District of New Jersey, Civil Action No. 09-04635 (JLL-MAH)
 - Appeared for plaintiff - Areas of expertise: Papermaking chemicals – patent infringement litigation.
- United States, Wisconsin v. NCR Corporation et al., US District Court, Eastern District of Wisconsin, Green Bay Division, Case No. 10-CV-00910-WCG
 - Appeared for plaintiff – areas of expertise: coating, air knife coaters; losses to the sewer.
- Mary Walker v. Stater Bros. Markets Inc. and Anheuser Busch and DOES 1-5, Superior Court of California for the County of Orange Central Justice Center, Case No. 30-2011-00516915
 - Appeared for plaintiff – Areas of expertise: Paperboard, packaging – personal injury.
- Georgia-Pacific Consumer Products LP, et al. v. NCR Corporation, et al., US District Court, Western District of Michigan, Case No. 1:11-CV-00483-RJJ
 - Appeared for plaintiffs – areas of expertise: papermaking, paper coating, carbonless paper manufacture, wastepaper grades and utilization, discharge of PCBs into the river
- Seed Company and Shigeru Tamai v. William F. Westerman, et al., US District Court District of Columbia, Case No. 1:08-CV-00355-RMU
 - Appeared for defendant – Paper and correction tape demand – patent infringement litigation.
- Steven Redfearn Stewart v. Albany International Corp., et. al., State of South
- Carolina County of York Court of Common Pleas, C/A No. 2013-CP-46-00368
 - Appeared for defendant Industrial Holdings - asbestos in paper machine dryer felts Areas of expertise: papermaking, paper machine clothing, dryer section ventilation, paper machine clothing company business practices.
- Precision Industrial Contractors, Inc. v. Snowflake Industrial Park, LLC et al., US District Court, Arizona Civil Action No. 3: 14-CV0804-PHX-JJT
 - Appearing for plaintiff – Areas of expertise, papermaking machinery, valuation of equipment for sale at a shutdown mill

- Precision Industrial Contractors, Inc. v. Snowflake Mill Investors, LLC et al., Superior Court of the State of California for the County of San Francisco, Case No. CGC-14-537664
 - Appeared for plaintiff – Areas of expertise, papermaking machinery, valuation of equipment for sale at a shutdown mill.
- Appvion, Inc. and NCR Corporation v. P. H. Glatfelter et al., US District Court, Eastern District of Wisconsin, Green Bay Division, Case No. 08-CV-00016-WCG
 - Appeared for plaintiffs – areas of expertise: papermaking, paper coating, carbonless paper manufacture, wastepaper grades and utilization, discharge of PCBs into the river.
- Donald Miller and Shirlee Miller v. Air & Liquid Systems, et al. State of Oregon County of Multnomah Circuit Court 16CV38331
 - Appeared for defendant Georgia-Pacific – asbestos exposure from machining supercalender and embosser rolls - areas of expertise: papermaking, calendering and finishing of paper, composition of supercalender and embossing rolls, practices common in the 1960s.
- Weyerhaeuser Co. v. Certain Underwriters at Lloyd's London, et al. King County Superior Court, State of Washington No. 16-2-017941 SEA
 - Appeared for plaintiff – papermaking, paper coating, carbonless paper manufacture, wastepaper grades and utilization, discharge of PCBs into the river – insurance litigation.
- Donald Miller and Shirlee Miller v. Weyerhaeuser Company, et al. King County Superior Court, State of Washington No. 17-2-21850- SEA
 - Appeared for defendant Neenah Paper – asbestos exposure from machining supercalender and embosser rolls - areas of expertise: papermaking, calendering and finishing of paper, composition of supercalender and embossing rolls, practices common in the 1960s.
- Mafcote, Inc. v. Navigators Insurance Company and Poseidon, LLC State of Connecticut Superior Court Judicial District of Stamford/Norwalk Docket No. FST-CV-17-6033420-S
 - Appeared for plaintiff Mafcote, Inc. – feasibility of paper coating project utilizing secondhand equipment – areas of expertise: paper coating – insurance/bond litigation.

- Cenveo Corporation, Cenveo, Inc., and Twin City Fire Insurance Company a/s/o Cenveo Corporation and Cenveo, Inc. v. Domtar Corporation and Domtar Paper Company LLC State of Connecticut Superior Court Judicial District of Stamford/Norwalk at Stamford Docket No. FST-CV-16-6030305-S
 - Appeared for defendant Domtar – suitability of paper for intended use – areas of expertise – papermaking, paper specifications, tablet papers, envelope papers, paper chemistry.
- Eveline Schwarz v. Target Corporation, Arizona Beverages USA LLC, Beverage Marketing USA, Inc., Graphic Packaging International, LLC, Citrus World, Inc. and Hornell Brewing Co., Inc. US District Court Southern District of Texas, Houston Division Civil Acton No. 4:19-cv-01306
 - Appeared for defendant Graphic Packaging - Areas of expertise: Paperboard, packaging – personal injury.
- Arclin USA, LLC v. Vits Technology and Huber Engineered Woods, US District Court Northern District of Georgia, Civil Acton No. 1:20-cv-01197
 - Appeared for plaintiff Arclin USA, LLC - Areas of expertise: Coating processes, materials, and technologies.
- Lawrence Higgins, et al. v. Huhtamaki, Inc., et al., US District Court of Maine, Civil Acton No. 1:21-cv-00369-JCN
 - Appearing for plaintiffs - Areas of expertise: Oil and grease resistant molded pulp and paper.
- Acorn West LLC v. Berkley International LLC, International Paper Company, et al. US District Court Central District of California, Civil Acton No. 2:21-cv-07821-CJC-SK
 - Appearing for defendants - Areas of expertise: Molded pulp

UNITED STATES PATENT AND TRADEMARK OFFICE

- International Paper Company v. MeadWestvaco Corporation, Case IPR2016-07825, U.S. Patent No. 7,749,583
 - Appeared for plaintiff - areas of expertise: pulp and paperboard manufacturing, low density paperboard.
- Stahl’s Inc. v. Jodi A. Schwendimann, Case IPR2020-00645, U.S. Patent No. 7,749,581 and U.S. Patent No. RE41-623

- Appearing for defendant - areas of expertise – sublimation transfer printing, chemistry, paper coating, digital imaging
- Neenah Inc. and Avery Products Corporation v. Jodi A. Schwendimann, Case IPR2020-, U.S. Patent No. 7,754,042
 - Appearing for defendant - areas of expertise – sublimation transfer printing, chemistry, paper coating, digital imaging
- Sealed Air Corporation v. Ranpack Corporation, Inter Partes Review of U.S. Patent 6,756,096 Challenging Claims 13-14
 - Appearing for plaintiff - areas of expertise – paper converting, supply of paper web, splicing, manufacture of paper cushioning and dunnage.

INTERNATIONAL TRADE COMMISSION

- 3M v. Janel, S.A. de C.V. In re Certain Canary Yellow Self-Stick Repositionable Note Products, Investigation No. 337-TA-467.
 - Appeared for defendant - Areas of expertise: papermaking, converting of paper products, cost of manufacture, marketing of converted paper products.
- 3M v. PRINT INFORM GmbH + Co. KG In re Certain Canary Yellow Self-Stick Repositionable Note Products, Investigation No. 337-TA-467
 - Appeared for defendant - Areas of expertise: papermaking, converting of paper products, cost of manufacture, marketing of converted paper products.
- Appleton Papers, Inc., Petitioner - Certain Lightweight Thermal Paper from China and Germany Investigations Nos. 701-TA-451 and 731-TA-1126-1127 (Final)
 - Appeared for petitioner – Areas of expertise: Lightweight direct thermal imaging papers, performance properties and substitutability.
- Schweitzer-Mauduit International v. delfortgroup A.G. et al. (D.S.C.) - In Re Certain Reduced Ignition Proclivity Cigarette Paper Wrappers and Products Containing Same, Investigation No. 337-TA-756
 - Appeared for defendants - Areas of expertise: Papermaking, paper properties, paper coating, gravure and flexo printing and coating, permeability of paper.

- Lamina Packaging Innovations LLC v. Remy Cointreau USA, Inc., et al. - In the Matter of Products Having Laminated Packaging, Laminated Packaging and Components Thereof, Investigation No. 337-TA-2940
 - Appeared for defendants – Areas of expertise: Paper-based packaging.

U.S. ENVIRONMENTAL PROTECTION AGENCY

- PMN No. TS-081489: P90-237, P90-248, P90-249, Nisseki Chemical Texas Inc., New Solvent for Carbonless Copy Paper
 - Appeared for Nisseki Chemical Texas Inc. -- Areas of expertise: carbonless paper manufacture, paper coating, papermaking, wastewater treatment, environmental release, and fate.

AUSTRALIAN GOVERNMENT

- Visy Glama Pty Ltd. v. Graphic Packaging International LLC and Graphic Packaging International Australia Converting Ltd, Dumping Investigation No. 548 – Certain Kraft Paperboard Exported to Australia from the United States of America. 2020
 - Appeared for defendant – Areas of expertise: papermaking, corrugating, materials of construction.

APPENDIX 2

MATERIALS CONSIDERED IN DECLARATION

Exhibit No.	Short Name	Description
Paper No. 1	Petition	Petition as filed, IPR2023-01206, Paper 1
1001	The ‘142 Patent	US Patent No. 11,293,142
1002	‘142 Patent File History	The relevant file history for US Patent No. 11,293,142
1003	Zotterman Declaration	Declaration of Carl Zotterman
1004	Fugitt	Fugitt et al., U.S. Pat. Appl. Pub. No. 2009/0236062
1005	Papermaking	Excerpts from Rautiainen, P. (2009). <i>Papermaking Science and Technology Book 10: Papermaking Part 3, Finishing</i> (2nd ed., pp. 35-42, 79-99). Paper Engineers’ Association.
1006	Gratton	Gratton, et al., Temperature-gradient calendering of foodboard, TAPPI JOURNAL January 1988
1007	Papermaking II	Excerpts from Lehtinen, E. (2000). <i>Papermaking Science and Technology Book 11: Pigment Coating and Surface Sizing of Paper</i> (pp. 581-583). Paper Engineers’ Association
1008	Crotogino	Temperature Gradient Calendering (Crotogino, R.H., (1982) Tappi J. 65(10):98).

Exhibit No.	Short Name	Description
1009	Paperboard Examples	Hannu (2000). <i>Papermaking Science and Technology Book 18: Paperboard and Grades</i> (p. 55). Paper Engineer's Association
1010	Remainder of Ex. 1005	Excerpts from Rautiatinen, P. (2009). <i>Papermaking Science and Technology Book 10: Papermaking Part 3, Finishing</i> (2nd ed., pp. 86-173). Paper Engineers' Association.
2002	Mohan	U.S. Patent No. 6,274,001 to K. Krishna Mohan, granted August 14, 2001