

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ALBANY INTERNATIONAL CORP.,

Petitioner

v.

VOITH PATENT GMBH,

Patent Owner.

PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,261,566

Case No. IPR2025-01116

**DECLARATION OF DR. DAVID BROOKSTEIN IN SUPPORT OF
PATENT OWNER'S PRELIMINARY RESPONSE**

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I. Introduction and Background**A. Engagement**

1. I have been retained on behalf of Voith Patent GmbH (“Patent Owner”) in connection with the above-captioned *inter parties* review (IPR) to provide my opinion in support of Patent Owner’s Preliminary Response. I am being compensated for my work at my standard consulting rate of \$450 per hour. I have no interest in the outcome of this proceeding.

2. In preparing this Declaration, I have reviewed, and I am familiar with the Petition for IPR2025-01116 (“Petition”), U.S. PATENT NO. 11,261,566 (the “’566 Patent”) and its file history, and all other materials cited and discussed in the Petition, including the declaration of Petitioner’s expert Dr. Christopher M. Pastore (“Dr. Pastore”).

3. The statements made herein are based upon my own knowledge and opinion. This Declaration represents only the opinions I have formed to date. I may consider additional documents as they become available or other documents that are necessary to form my opinions. I reserve the right to revise, supplement, or amend my opinions based on new information and on my continuing analysis.

B. Qualifications

4. I am currently the sole owner and operator of Brookstein Consulting LLC, where I have worked since 2000. In this role, I provide engineering and

litigation consulting services in the fields of textiles, mechanical assemblies made from textile materials, garment systems, fibers, yarns, woven fabrics, knitted fabrics, and composites.

5. I received a Bachelor of Textile Engineering from the Georgia Institute of Technology (“Georgia Tech”) in 1971, a Master of Science degree in Textile Technology from the Massachusetts Institute of Technology (“MIT”) in 1973, and a Doctor of Science degree (Sc.D.) in the field of Mechanical Engineering from MIT in 1976, with Minor Studies in Management from Sloan School of Management.

6. I worked as an Assistant Professor of Textile Engineering at Georgia Institute of Technology (“Georgia Tech”) between 1975-1980. At Georgia Tech, I taught classes and conducted research in the fields of textile engineering, which includes yarn manufacturing and mechanics, weaving and woven fabric mechanics, knitting and knitted fabric mechanics, and fiber reinforced composites engineering.

7. From 1980 to 1994, I was employed by Albany International Research Co. (formerly Fabric Research Laboratories, “Albany”). I started as a Senior Research Associate, was promoted to Assistant Director in 1983, and was again promoted to Associate Director in 1992. In these positions, I directed all activities of the professional engineering group responsible for contract research, development, and manufacture of advanced composite materials and technical

polymeric materials of yarns and fabrics. Further, I was the lead engineer on an internal Albany project to develop advanced paper machine clothing (“PMC”) used by manufacturers of paper. My textile engineering innovations during this time led to 13 U.S. patents and many other unpatented trade secrets. One of these trade secret projects involved a new method for drying paper on paper machine clothing during the papermaking process. While working at Albany, I supervised an engineering team that conducted a plant trial on a prototype paper making machine at the University of Maine Process Development Center (PDC). The PDC’s pilot paper machine was capable of several processes, including complete equipment analysis, raw material studies, and process operation studies.

8. While employed at Albany, I also worked at a part-time position as an Adjunct Professor of Mechanical Engineering at Northeastern University in Boston between 1981-1983, where I taught undergraduate courses in statics, dynamics, and mechanics of deformable bodies and material science.

9. From 1994 to 2010, I worked as the Dean and Professor of Textile Engineering and Mechanical Engineering at the School of Engineering and Textiles at Philadelphia University (formerly Philadelphia College of Textiles and Sciences). Subsequently, from 2010 to 2012, I was the Executive Dean for University Research and Professor of Mechanical Engineering and Textile Engineering. During my time at Philadelphia University, I held many other

positions, including Executive Director of the Institute for Textile and Apparel Product Safety, Executive Director of Pennsylvania Advanced Textile Research and Innovation Center including Biomedical Textile Structures Laboratory, and Executive Director of Research. I also taught courses dealing with weaving.

10. From 2002 to 2003, I was on a part-time sabbatical as a Visiting Scholar at Harvard University Center for Textile and Apparel Research (Division of Engineering and Applied Sciences and Harvard Business School). During this time, I studied national and international trends in patent applications involving textile structures.

11. From 2009 to 2012, I also worked as a part-time consultant at MAG Industrial Automation Systems, where I was an engineering consultant to a worldwide manufacturer of engineered automation systems for the aerospace industry.

12. From 2012 to 2013, I worked as the Dean for Science, Technology, Engineering and Mathematics (STEM) at Montgomery County Community College in Pennsylvania. In this role, I was Chief Academic Officer for all programs in engineering, physical sciences, biological sciences and computer sciences.

13. From 2013 to 2014, I worked as the Director of Market Development at ICF Mercantile. In this role, I was responsible for technical and market development of antimicrobial, antifungal, and flame-resistant textile fabrics.

14. In 2014, I was appointed as Professor of Mechanical Engineering and Director of Undergraduate Affairs at the Temple University College of Engineering and was subsequently promoted to Associate Dean, and in 2017, I was promoted to Senior Associate Dean for Undergraduate Studies at the Temple College of Engineering. From 2014 to 2024, I was responsible for the senior design capstone courses for all engineering students and was responsible for engineering programs accreditation and engineering technology programs accreditation from the Accreditation Board for Engineering and Technology ("ABET").

15. In July of 2024, I retired and became Professor Emeritus of Mechanical Engineering at Temple University College of Engineering, which is my current status.

16. I now have over 50 years of design, research and development, teaching and consulting experience in the textile industry. During this time, I have been elected by my peers to receive several nominations and prizes. For example, I was peer-elected as a Fellow of The Textile Institute (United Kingdom). In 1993, I was awarded the Techtextil Innovation Prize (Germany). In 1995, I was elected by my peers as a Fellow of the American Society of Mechanical Engineers, which is

an honorific awarded to only about 1% of its members. In 1998, I was awarded the ASTM Harold Dewitt Smith Award for textile fiber utilization. I have also been a member of the American Society for Engineering Education, the Institute of Industrial and Systems Engineering, the American Conference of Academic Deans, the Fiber Society, and the Society for Advanced Materials and Processes.

17. I also have experience as an innovator and inventor. I am a named inventor on 13 U.S. patents, all of which relate to structures made using the principles of textile engineering and science. I have also developed numerous trade secrets and inventions, including a patent for Albany International that involved paper machine clothing (PMC).

18. My experience, qualifications, and education are detailed in my *curriculum vitae* ("CV"), a copy of which is attached as EX 2002. My CV also lists my relevant textile patents and identifies parties on behalf of whom I have previously provided expert testimony.

II. Legal Understanding

A. The Person of Ordinary Skill in the Art ("POSITA")

19. I understand that the disclosure of patents and prior art references are to be viewed from the perspective of a hypothetical person having ordinary skill in the art at the time of the invention ("POSITA"), who is presumed to 1) be aware of

all pertinent art, 2) think along conventional wisdom in the art, and 3) be a person of ordinary creativity—not an automaton.

20. A POSITA relevant to the '566 Patent at the time of the invention would have a bachelor's degree in Material Science, Materials Engineering, Mechanical Engineering, Textile Engineering, or a comparable field, and at least two years of working in textile engineering, fibers and textile manufacturing, or a related field.

21. Based on my education and professional experience, I am well-qualified, as discussed above, to render opinions from the perspective of a POSITA as of the March 15, 2018, filing date of the German patent application to which the '566 patent claims priority (the "Priority Date"), or before. I was a person of at least ordinary skill in the art at the time of the priority date of the '566 patent. Unless I state otherwise, I provide my opinion herein from the viewpoint of a POSITA as of the Priority Date, or before.

B. Anticipation and Obviousness

22. I have a general understanding of what constitutes prior art based on my discussions with counsel. I understand that a printed publication must be publicly available before the priority date of a particular patent claim in order to qualify as "prior art."

23. It is further my understanding that a patent claim is invalid as “obvious” under 35 U.S.C. § 103 in light of one or more prior art references if it would have been obvious to a person having ordinary skill in the art, taking into account (1) the scope and content of the prior art, (2) the differences between the prior art and the claims, (3) the level of ordinary skill in the art, and (4) any so called “secondary considerations” of non-obviousness, which include: (i) “long felt need” for the claimed invention, (ii) commercial success attributable to the claimed invention, (iii) unexpected results of the claimed invention, and (iv) “copying” of the claimed invention by competitors, praise for the invention, skepticism for the invention, or independent development.

24. I understand that a claim can be obvious in light of a single prior art reference or multiple prior art references. To be obvious in light of a single prior art reference or multiple prior art references, there must be a reason to modify the single prior art reference, or combine two or more references, in order to achieve the claimed invention. This reason may come from a teaching, suggestion, or motivation to combine, or may come from the reference or references themselves, the knowledge or “common sense” of a POSITA, or from the nature of the problem to be solved and may be explicit or implicit from the prior art as a whole. I also understand that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.

25. I further understand it is improper to rely on hindsight in making the obviousness determination. To guard against hindsight and an unwarranted finding of obviousness, I understand that an important component of any obviousness inquiry is whether any teaching, suggestion, or motivation that would have prompted a person of ordinary skill in the art to make the claimed combination and have a reasonable expectation of success in doing so. I understand that this test should not be rigidly applied but can be an important tool to avoid the use of hindsight in the determination of obviousness.

26. I further understand that the teaching, suggestion, or motivation may be found explicitly or implicitly: (1) in the prior art; (2) in the knowledge of those of ordinary skill in the art that certain references, or disclosures in those references, are of special interest or importance in the field; or (3) from the nature of the problem to be solved. Additionally, I understand that the legal determination of the motivation to combine references allows recourse to logic, judgment, and common sense. In order to resist the temptation to read the teachings of the invention at issue into the prior art, however, it should be apparent that “common sense” should not be conflated with what only appears obvious in hindsight.

27. I understand that it is improper to combine references where the references teach away from their combination. I understand that a reference may be said to teach away when a person of ordinary skill in the relevant art, upon reading

the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. I further understand that if the teachings of a prior art reference would lead a person of ordinary skill in the art to make a modification that would render another prior art device inoperable, then such a modification would generally not be obvious. I also understand that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there would have been no suggestion or motivation to make the proposed modification.

III. Claim Construction

28. In my opinion, all claim terms should be given their ordinary meaning in light of the '566 patent specification.

IV. Brief Overview of the '566 Patent

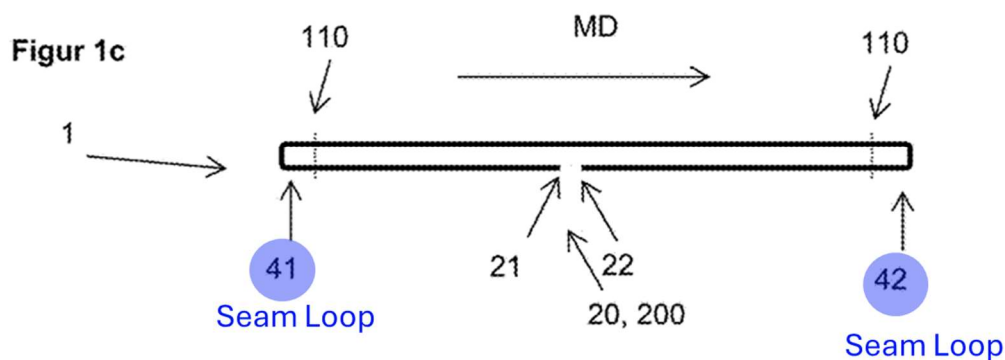
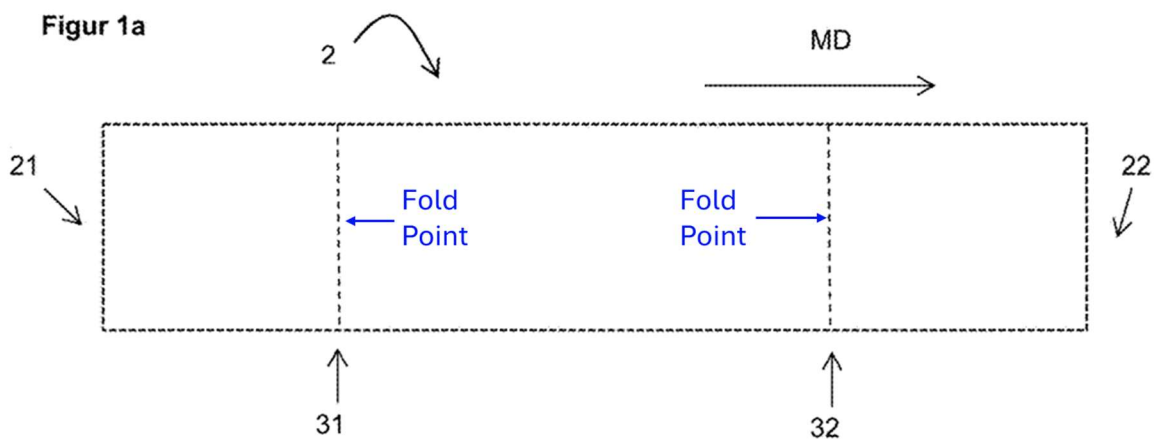
29. The '566 Patent generally relates to a clothing for a paper making machine. The clothing is known in the field as Paper Machine Clothing ("PMC"). The PMC is a highly specialized fabric that is on a papermaking machine and works as the underlying support structure for the papermaking machine as it transforms mixtures of water and celluloses fiber (known as pulp) into sheets of paper. The PMC is not just any ordinary fabric. It is a carefully engineered textile designed to endure stress (*e.g.*, relatively high transverse compressive stresses),

extreme heat, and moisture such that it can support wet pulps of fiber as they go through sheet formation, pressing, and drying. Therefore, a carefully designed PMC is crucial for maintaining an accurate and efficient papermaking operation.

30. Given their highly specialized nature, different types of PMC are required in different parts of a papermaking machine to perform the specific tasks required for papermaking. For example, forming fabric PMCs are designed to function as the initial interface for wet pulp mixture to allow water to drain from cellulose fiber pulp while retaining the cellulose fibers to form a paper web, press felt PMCs are industrial-grade fabrics that are designed to express water under the pressure of heavy rollers while consolidating fibers to enhance sheet strength. Given the nature of their function in the papermaking process, press felts must be designed to meet high durability standards. Press felt PMCs can be made to be seamless or seamed. Seamless press felts are woven as a continuous loop and designed to provide uniform pressing without leaving marks on the paper. Seamed press felts, on the other hand, are fabricated by joining two press felt ends to form a loop and are often favored because they are easy to maintain and replace.

31. The '566 Patent discloses a clothing that includes a base structure having a two-layer laminate structure. '566 Patent 1:8-19. The two-layer laminate structure includes or is formed using one or more flat-woven fabrics. The '566 Patent (EX 1001) 1:8-19, 8:66-9:1, Figures. 1a, 1c (reproduced below in annotated

form). For example, as shown in Figures. 1a and 1c, the two-layer laminate structure 2 can be formed from a single flat-woven element by folding and laying the two ends 21, 22 of the flat fabric on the central part of the flat cloth, thereby forming a double-layer structure with seam loops 41, 42 formed at the fold points 31, 32. *Id.* 8:31-35.



32. The flat-woven fabric structure is formed from machine-direction (“MD”) threads or yarns that are oriented in the longitudinal direction of the base direction and cross-direction (“CD”) threads or yarns that are oriented in the

transverse direction of the base structure. *Id.* 2:11-26. Seam loops are produced at the folding points 31, 32 by removing CD threads. *Id.* 8:36-37. “After interengaging the seam loops of the two ends, an insertion element or pintle shown with a hatched cross section in a circle is inserted in the loop opening so that the two loop ends can no longer disengage.” *Id.* 9:30-34. Any insertion element or pintle can be used. For example, pintles made from one or filaments can be used. *Id.* 4:25-27.

33. The side ends 21, 22 of the double-layer structure form a joint 30. *Id.* 1:65. At the region of the joint 20, the side ends 21, 22 can overlap, touch or, have a small distance from each other. *Id.* 8:41-46.

34. The '566 Patent discloses and claims a PMC in which provision is made for the diameter of the seam loops (“LD-loop diameter”) and the diameter of the associated MD threads (MDYD) to have a ratio ($\frac{LD}{MDYD}$) of between 2.5 and 4, and in particular between 2.7 and 3.6. *Id.* 2:63-67. This specific range of “between 2.7 and 3.6” provides a seam with “very high strength, without which satisfactory use, for example as a seam felt, is not possible.” *Id.* 3:4-5. Further, this specific ratio facilitates closure of the seam, simplifies inserting the pintle (*i.e.*, passing the pintle through the loops), reduces the time to draw in clothing, and offers ergonomic advantages for the operator of the installation. *Id.* 3:4-16.

35. In addition to the $\frac{LD}{MDYD}$ ratio, the '566 Patent discloses a structure in which the loop density of the seam is between 64% and 90%. *Id.* 16:36-40. Loop density is the number of seam loops per unit length. *Id.* 6:12-13.

36. The inventors of the '566 Patent recognized that this particular range is optimal because it provides a seam with reduced permeability. *Id.* 16:36-40. In contrast, having a loop density above 90% can result in losing the ability to seam the clothing, making it more difficult to arrange the seam loops to interengage. *Id.* 16:36-47.

37. Further, a PMC designed with the combination of having the specific $\frac{LD}{MDYD}$ ratio and loop density ranges is highly advantageous because it will have a seam which – as a result of the high loop density – has a low permeability and nevertheless – as a result of the optimal $\frac{LD}{MDYD}$ ratio, can be closed easily.” *Id.* 7:15-19.

V. Technical Opinions on Petitioner’s Obviousness Grounds

38. Petitioner and Dr. Pastore rely on certain assumptions and calculations to form their obviousness positions. Several of their assumptions and calculations are fundamentally incorrect. In the following paragraphs, I have provided my opinion on their positions, identifying areas where Dr. Pastore’s (and Petitioner’s)

assumptions and calculations are incorrect based on commonly known principles from the point of view of a POSITA.

A. Ground 1: The Combination of Sudre and Adanur Does Not Render the Claims Obvious

1. A POSITA Would Not Look into Adanur to Modify Sudre

39. Petitioner relies on a half-sentence in *Sudre* that indicates “in the case of a flat-woven structure requisite lengths of base fabric woven in any desired weave pattern (*sic*) may be cut from a stock supply thereof, and a papermaker's fabric meeting the particular requirements of its intended end use as regards performance characteristics can be produced from that base fabric in a simple and ready manner” to argue that this statement was sufficient to motivate a POSITA to look into various prior art references, such as Adanur, Lee, Penven, and Rydin to determine the values of $\frac{LD}{MDYD}$ ratio and loop density for designing a PMC.

However, neither Petitioner nor Dr. Pastore offer any specific reason or any substantive evidence explaining why or how in this sentence would motivate a POSITA to look into Adanur or other references to find specific values of the $\frac{LD}{MDYD}$ ratio and loop density for designing a PMC.

40. The disclosure of *Sudre* also does not identify any technical problem related to seam loop density or loop diameter ratios. It merely describes a

conventional method for forming a seam in a flat-woven fabric but does not suggest any optimization of dimensional parameters.

41. Adanur, for its part, is a general textbook that presents Figure 3.15 in a section titled “The Batt,” with the apparent purpose of illustrating the batt fiber structure, does not offer any teaching of seam configuration. The batt fiber structure is a needle punched assembly of nonwoven fibers. The Petitioner’s reliance on this figure to derive seam related parameters is therefore misplaced.

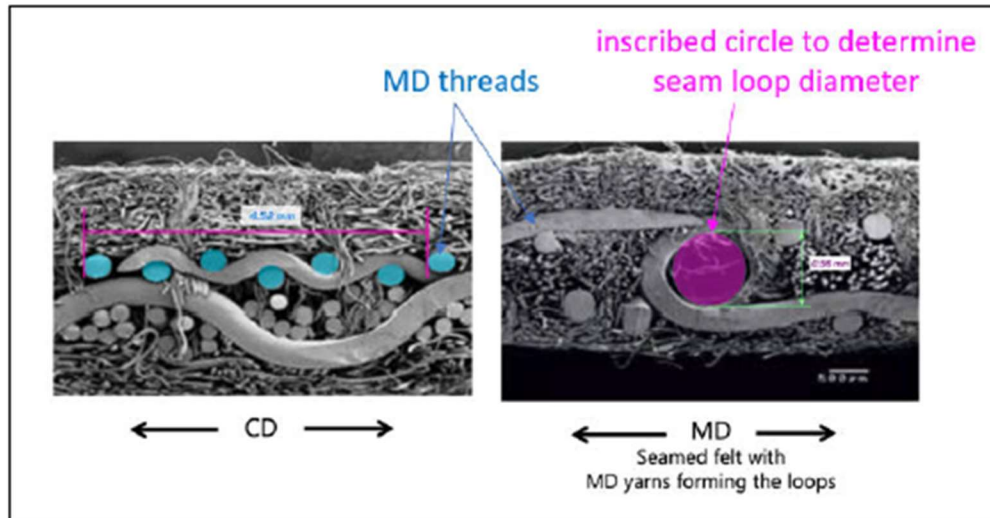
42. Moreover, Adanur does not describe the illustrated parameters, such as monofilament diameter, seam loop diameter, or loop density, as technically advantageous or optimized for seam performance. There is no indication that these values were selected to improve seam strength, uniformity, permeability, or any other functional property relevant to the claimed invention.

43. Therefore, in my opinion, Sudre provides no motivation for a POSITA to look into the teachings of Adanur to find the specific values of the $\frac{LD}{MDYD}$ ratio and loop density for designing a PMC recited in claim 1.

2. Adanur’s Pictures Show Two Different Fabrics

44. Petitioner’s arguments in Ground 1 rely on measurements obtained by Dr. Pastore from two photographs provided in FIGURE 3.15 of Adanur (EX 1021). I have reproduced Dr. Pastore’s annotated photographs below. As shown, the first

photograph is captioned “CD” (“CD Picture”), and the second photograph is captioned “MD” (“MD Picture”).

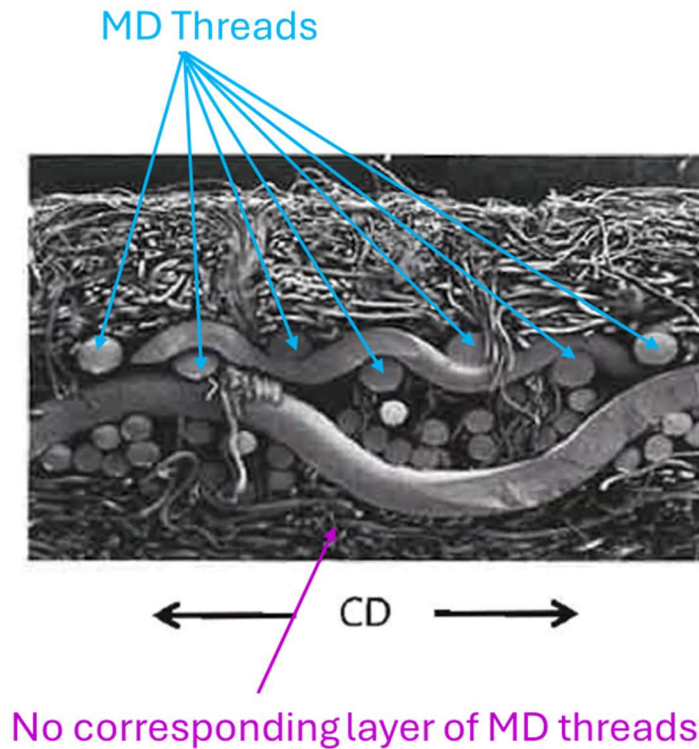


Adanur, Fig. 3.15 (annotated)

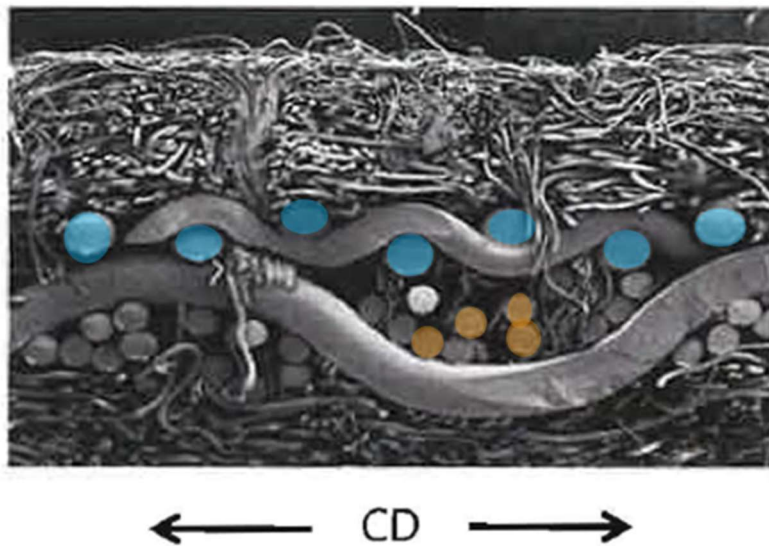
45. Dr. Pastore indicates that he has “taken measurements of these images using conventional approaches, namely, measuring distances and length in pixels and converting pixels to actual lengths (e.g., mm) based on the scale bar that is shown in the image.” EX 1003, ¶ 66. A pixel, short for "picture element," is the smallest unit of a digital image or display. In other words, Dr. Pastore has assumed that the CD Picture and the MD Picture are both obtained from the same fabric, and that the images are dimensionally scaled, and provided such that a POSITA can take measurements of the thread dimensions and use those dimensions for manufacturing a press felt. In my opinion, these assumptions are incorrect for multiple reasons.

46. First, as I explained above, press felts are carefully designed industrial-grade fabrics that are designed to express water under the pressure of opposing rollers while consolidating fibers to enhance sheet strength. Given the nature of their function in the papermaking process, press felts must be designed to meet high durability standards. Therefore, a skilled person would not simply rely on measurements of photos in a textbook to design a PMC because a POSITA would understand that designing such structures requires careful precision and careful consideration of technical specifications of the PMC.

47. Moreover, Dr. Pastore incorrectly assumes that the CD Picture and the MD Picture are from the same fabric. A POSITA visually inspecting the CD Picture can readily see that no MD threads are visible at the bottom of the structure. If the CD Picture were from a two-layer structure created by folding a base weave, for example, as I described above with reference to Figures 1a and 1c of the '566 Patent, it would have two identical, "mirror image" layers of MD yarns (*i.e.*, two identical layers having circular cross-sections similar to the cross-sections Dr. Pastore has colored blue). However, as I have shown below, the CD Picture of Adanur does not have a second layer of MD threads that correspond to the top layer of MD threads.



48. Further, as shown below, there are fewer MD yarns on the top portion of the CD Picture when compared to the bottom portion of the CD Picture and the MD yarns on the top (annotated below in blue) appear to have larger dimensions than the MD yarns on the bottom (annotated below in orange) of the CD Picture. If the CD and MD Pictures were photos of the same structure, MD threads would necessarily be visible at the bottom of the structure, especially if the structure were a two-layer laminate with continuous MD threads, as Dr. Pastore and the Petitioner assert.



49. Similarly, if the CD and MD Pictures were photographs of the same structure, then the more numerous, smaller MD yarns on the bottom of the CD Picture (annotated above in orange) would appear in the MD Picture. **They do not.**

50. Therefore, the CD and MD pictures do not depict the same textile structure. This is further confirmed by the text of Adanur, which clearly states the pictures show “cross-sections of actual finished press *fabrics*.” Adanur uses the plural term (“fabrics”) and provides no indication that the two fabrics are structurally linked or derived from the same fabric sample. *See, e.g.,* EX 1021, p. 111.

51. Moreover, a POSITA would readily appreciate that the CD and MD Pictures have different height and magnification levels, such that the scale bar of the MD Picture cannot be applied to measure any of the dimensional

characteristics of the filaments of the CD Picture. Even assuming only for the sake of argument that the two pictures are of the same fabric, the scale bar of the MD Picture can only be applied to the CD Picture if the two pictures have the same magnification level and show the threads according to the same magnification scale. Specifically, a POSITA would understand that if he takes two photographs of the same press felt with the same magnification level, the resulting depiction of the press felt should have the **same thickness** in both pictures. However, the press felt shown in the CD Picture of Adanur is clearly at least about 1/3 thicker than the felt shown in the MD Picture. Thus, even if one incorrectly assumed these pictures were of the same fabric, they clearly are not of the same magnification and scale.

52. I find it particularly surprising that Dr. Pastore failed to recognize these fundamental inconsistencies because, in my opinion, a qualified textile engineer should have recognized that the two images cannot represent the same fabric, especially considering the absence of MD threads in the CD image, and certainly are not of the same magnification and scale.

3. No Evidence that the CD Picture Depicts a Seam Structure

53. Lastly, there is no indication in *Adanur* that the CD Picture depicts a seam structure. *Adanur* simply states that the CD and MD Pictures show “the most common means of batt application.” EX 1021, at 111. There is no indication that the MD threads in the CD Picture form seam loops, nor is there any evidence that

the illustrated fabric in the CD Picture is part of a seamed press felt, as discussed above. In fact, considering that Figure 3.15 appears in a section of Adanur titled “The Batt,” a POSITA can reasonably assume that the CD Picture is provided to illustrate the batt fiber structure, and not a seam region. Therefore, a POSITA would not have been motivated to rely on measurements of the CD and MD pictures of Adanur to inform dimensions of the threads and seams.

54. Accordingly, the Petitioner and/or Dr. Pastore provide no credible basis for asserting that the measured loop density corresponds to the claimed seam configuration, and without evidence of loop formation or seam context, the calculated density is irrelevant to the claimed invention.

4. Dr. Pastore’s Analysis of the Measurements is Statistically Unsound and Meaningless

55. Despite the inconsistencies discussed above, Dr. Pastore and Petitioner ignore the clear visual differences between the fabrics in the CD and MD Pictures and assert that the scale between the two images can be assumed to be consistent. EX1003, ¶¶69–72. Dr. Pastore and Petitioner subsequently combine measurements of the CD and MD Pictures to derive quantitative values for thread diameter, loop diameter, and loop density. These faulty assumptions render these measurements unreliable and the resulting calculations and conclusions erroneous.

56. However, even ignoring the analytical flaws discussed above, there is an additional and critical observation that can be made by Dr. Pastore's measurements. First, even assuming that these two photographs were from the same fabric, the scale of the photographs would need to be adjusted to be the same before taking measurements of the photographs. Dr. Pastore did not make any adjustments to the scale of the photographs. Further, Dr. Pastore states that he “measured two diameters (in pixels): one in the horizontal direction and another in the vertical direction [and] averaged these measurements and obtained an average MD thread diameter of 69 pixels with a standard deviation of 9.6 pixels.” EX 1003, ¶¶ 69-70. For example, Dr. Pastore states that he identified seven (7) MD threads in the CD Picture and measured two diameters for each thread: a vertical diameter and a horizontal diameter:

Horizontal diameter (pixels)	Vertical Diameter (pixels)
80	59
76	60
75	61
79	65
75	63
77	58
79	65

57. Dr. Pastore indicates subsequently “averaged these measurements to obtain an average MD thread diameter of 69 pixels with a standard deviation of 9.6 pixels.” *Id.* ¶ 70.

58. As an initial matter, nowhere in Adanur is there any indication that Adanur was provided the CD and MD Pictures for dimensional analysis, and no indication that these photographs are provided to scale for use by a POSITA to determine dimensions of a base structure. Further, when I averaged the “horizontal diameter” of the 7 Pastore measured threads the average “horizontal diameter” is 77.3 pixels and when I averaged the “vertical diameter” of the same 7 Pastore measured threads the average “vertical diameter” is 61.5 pixels. Thus, the average “horizontal diameter” is approximately 25% greater than the average “vertical diameter”. **This indicates that the threads are oval in shape.** As it is well-understood by a POSITA with experience in the paper machine clothing industry that MD threads are known to have a round cross-section, the oval presentation of the MD threads in the CD Pictures strongly suggests that the CD Picture is distorted and cannot be relied upon for dimensional analysis.

59. Further, by simply averaging the vertical and horizontal diameters, Dr. Pastore overlooks fundamental and well-known principles of statistics and incorrectly assumes that the vertical and horizontal diameter samples have the same distribution. The T-Distribution (or Student’s T-Distribution) Confidence

Interval is a well-known data analysis scheme used for analyzing distribution of data obtained from smaller sample sizes, where population variance is unknown. In order to construct a confidence interval, a sample mean is first constructed. This sample mean is the average of the sample data. Since Dr. Pastore has two datasets (*i.e.*, horizontal diameter dataset and a vertical diameter dataset), he would need to calculate two averages (or two means): one average for the horizontal diameter data and another average for the vertical diameter data:

$$\text{Mean (horizontal diameters)} = 77.29$$

$$\text{Mean (vertical diameters)} = 61.57$$

60. A sample standard deviation should then be calculated for each sample and each average:

$$\text{Standard Deviation (horizontal diameters)} = \sqrt{\frac{\sum_{n=1}^7 (\text{horizontal diameter}_n)^2}{n - 1}} = 2.06$$

$$\text{Standard Deviation (vertical diameters)} = \sqrt{\frac{\sum_{n=1}^7 (\text{Vertical diameter}_n)^2}{n - 1}} = 2.83$$

61. Individual T-Distribution confidence intervals can then be calculated for each dataset.

62. However, Dr. Pastore's calculations are not correct because he has incorrectly averaged measurements of two different metrics to arrive at a meaningless value that fails to represent the actual aspects of the CD Picture.

In fact, Dr. Pastore's individual horizontal and vertical data points serve to support Patent Owner's arguments that *Adanur* did not intend the CD Picture to be used for dimensional analysis. As shown above, the MD threads that Dr. Pastore measured exhibit an oval-shaped cross section with a horizontal diameter of 77.29 ± 2.06 pixels and a vertical diameter of 61.57 ± 2.83 pixels. **As noted, it is well-understood by a POSITA with experience in the paper machine clothing industry that MD threads are known to have a round cross-section, the oval presentation of the MD threads in the CD Pictures strongly suggests that the CD Picture is distorted and cannot be relied upon for dimensional analysis.**

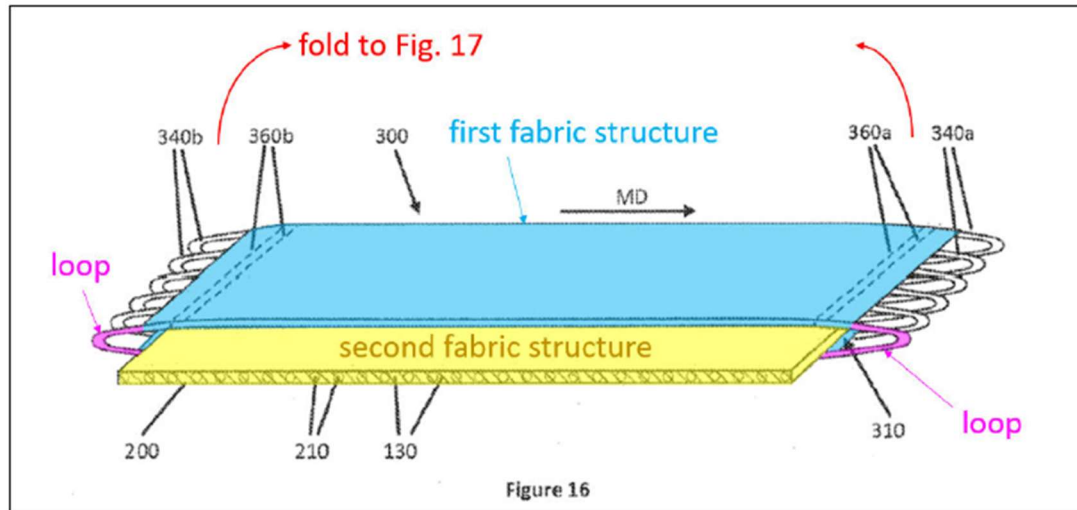
63. Therefore, Petitioner and Dr. Pastore's arguments in Ground 1 rely on incorrect and unjustified assumptions, inaccurate measurements, and unsound analysis of those inaccurate measurements. **These flaws in Pastore's analyses undermine substantially the entire arguments presented in Ground 1.**

B. Ground 2: A POSITA Would Not Look into Lee to Modify Sudre and Penven

1. Lee Discloses a Complex Two-Layer Structure that Would Not be Appropriate for Combining with the Structures of Sudre and Penven

64. Lee discloses a complex two-layer fabric structure having two distinct first and second structures arranged such that the first structure forms the seam loops and is responsible for the mechanical integrity of the seam loops and the second fabric structure is a different "generally planar yarn assembly" that is

inserted into the tube formed by the first fabric structure. *Id.* 16, 29-30, *See also Lee*, Figure 16 (reproduced below, as annotated by Petitioner, Petition at 74).



Lee, Fig. 16

65. Lee explains that the diameter of the yarns of the second structure is generally less than the diameter of the yarn in the first structure and that the yarns of the second structure preferably have a yarn diameter of about 0.4 mm. For example, in a particularly preferred arrangement of the second fabric structure, the yarn density of the second structure is 24 yarns/in (9.45 yarns/cm), the diameter of the yarns in the first array is about 0.5 mm, and the yarn density of the first fabric structure is 18 yarns/in (7.1 yarns/cm).

66. Lee's first structure includes loops **310** but its second structure does not. Further, Lee explicitly indicates that the diameter of the yarns of the second structure is generally less than the diameter of the yarn in the first structure and

states that a second structure having 0.4 mm yarn diameter and 9.45 yarns/cm density is used with its preferred first structure that has 0.5 mm yarn diameter and 7.1 yarns/cm density. Lee further states that this configuration of the yarns of the first structure is necessary for providing sufficient “tensile strength to the assembled press felt” for ensuring that the press felt is “sufficiently robust so as to withstand the various mechanical and environmental forces to which they may be exposed during use.” Lee, 26-27.

67. Despite these explicit teachings of Lee, Petitioner and Dr. Pastore rely on the yarn diameters of the second fabric structure (which does not have loops) to argue that a POSITA would have been motivated to apply the yarn diameters of the second fabric structure to the first fabric structure to arrive at claims of the ’566 Patent.

68. In my opinion, this argument is incorrect for several reasons. First, Lee specifically states in order to have a “sufficiently robust” fabric structure, the first fabric structure is designed to have yarns that have a larger diameter than the yarns of the second fabric structure. Lee, 26-27. A POSITA would understand the importance of having a robust base structure and appreciate that the yarn diameter and spacing of a base structure are critical design parameters that are not simply interchangeable. Arbitrarily transferring values from the second structure to the

first would contradict Lee's explicit instruction that these parameters must be carefully selected to ensure seam strength and durability.

69. Further, while the first structure of Lee includes a seam, the second structure of Lee does not include a seam. A skilled person seeking to obtain relevant parameters for the seam would not look into the second structure of Lee that does not have a seam.

70. Furthermore, a POSITA would understand that Sudre, Lee, and Penven have significantly different structures. While Sudre and Penven, as the Petitioner has acknowledged, teach "typical" structures, Lee discloses a complex multi-layered fabric structure that includes a second fabric structure with a "generally planar yarn assembly" that is inserted into a tube formed by the first fabric structure. Lee, 16 ¶2.

71. Lastly, although *Penven* refers to "an internal void diameter of about 50 mils," *Penven* fails to connect this "50 mils" to a specific seam geometry, material, or manufacturing method. The "50 mils" value is provided as a generic approximation in a sentence that discusses "a typical seam," and is not related to any particular fabric structure. *Penven* 3:64-68.

72. Accordingly, it is my opinion that Lee teaches a significantly more complex structure from the structures disclosed in Sudre and Penven, and a POSITA would not have been motivated to look into the teachings of Lee to

modify Sudre and Penven. It is also my opinion that a POSITA would appreciate and understand the significance and importance of the metrics disclosed for the first and second structures and would not have been motivated to operate contrary to teachings of Lee and use the metrics of the second structure to modify the structures of Sudre and Penven. A POSITA would understand from both general technical knowledge and Lee's explicit guidance that the yarn diameter and spacing in the first fabric structure are critical to seam performance. Therefore, the POSITA would not arbitrarily transfer values from the second structure to the first structure, especially not in contradiction to Lee's clear recommendation to use larger yarns in the first fabric structure.

2. Penven Does Not Disclose the Claimed Loop Diameter in a Technically Relevant Context

73. Penven does not disclose the diameter of the MD threads (MDYD) used to form the seam loops, and without this information, the LD/MDYD ratio cannot be determined. Petitioner and Dr. Pastore attempt to fill this gap by importing a 0.4 mm thread diameter from Lee. However, as discussed above, Lee does not disclose this value in the first fabric structure, and even discourages its use in that context. In my opinion, a POSITA would not be motivated to combine these isolated values from two unrelated references.

74. Further, Petitioner's and Dr. Pastore reliance on Penven's reference to a "typical seam" is fundamentally inconsistent with the structural configuration disclosed in Lee. Penven's 50 mil value is presented as a general approximation for conventional seam constructions (*i.e.*, those formed by intermeshing loops at the ends of a single-layer base fabric). In contrast, the seam in Lee is formed at the ends of a complex, multi-layered structure that includes an internal "second fabric" (a planar yarn assembly) inserted into the tubular base. This configuration is highly atypical and differs substantially from the conventional seam geometry described in Penven.

75. As explained above, a POSITA would not assume that dimensional values disclosed for a "typical seam" in a conventional single layer press felt can be directly applied to the seam of a structurally distinct, multi-component press felt as disclosed in Lee. The mechanical requirements, seam geometry, and material behavior are fundamentally different and there is no reason to motivate the POSITA to combine Penven's generalized seam dimensions with Lee's unconventional felt structure.

76. Lastly, Penven does not disclose a two-layer laminate structure formed from flat-woven fabrics, as required by claim 1. In contrast, Penven's seam construction is based on intermeshing loops formed at the ends of a single-layer woven base fabric. There is no disclosure of folding, layering, or joining long-side

ends to form a laminated structure. Accordingly, there would be no reason for the POSITA to look into the single-layer structure of Penven and its isolated mention of a 50-mil void diameter to modify Lee which discloses a complex structure having two super imposed layers and Sudre, which makes no mention of laminate structures

C. Ground 3: The Combination of Sudre and Rydin Does Not Render the Claims Obvious

1. A POSITA Would Not Look into Rydin to Modify Sudre Because Sudre and Rydin Address Fundamentally Different Problems

77. As detailed below, in my opinion a POSITA would not be motivated to look into the pictures of Rydin to modify Sudre because these references address fundamentally different technical problems: Sudre describes a method for forming a seam in a flat-woven fabric using interdigitated loops and a pintle. Rydin, by contrast, introduces a new design concept involving the integration of a specialty batt-like yarn into the base fabric to improve press felt performance. The article discusses a “new generation of press felts” and focuses on material innovation and not geometric optimization.

2. Dr. Pastore’s Measurements of Rydin are Scientifically Unsound

78. In Ground 3, Petitioner and Dr. Pastore once again have focused on measurements of Rydin to estimate a seam loop diameter of 167 pixels and a

monofilament diameter of 53 pixels, yielding an $\frac{LD}{MDYD}$ ratio of approximately 3.2.

However, as explained below, Petitioner's methodology is fundamentally flawed.

79. Similar to Ground 1, Dr. Pastore's measurements in Ground 3 are once again scientifically unsound. For example, Dr. Pastore reports his measured values with excessive precision (*e.g.*, 0.0091 threads/pixel), **without providing any indication of measurement accuracy, standard deviation, or error margins**. For the determination of the loop diameter, only a single measurement was performed, and no repeat measurements were taken. For the MDYD value, approximately ten measurements were conducted, which show significant variation. However, Dr. Pastore fails to analyze how this variation affects the derived the $\frac{LD}{MDYD}$ ratio. Dr. Pastore's omission contradicts basic standards of scientific methodology used by engineers.

80. The lack of error analysis in Dr. Pastore's measurements is particularly relevant. If the reported the $\frac{LD}{MDYD}$ ratio of 3.2 carries an uncertainty of 10–15%, the true value may fall outside the claimed range of 2.7–3.6. Given the observed spread in the underlying measurements, such an error margin is very likely.

81. Dr. Pastore's determines MDYD and LD by manually drawing lines and circles over a scanned image of a marketing photograph. However, this

approach is very unreliable because the conditions under which the original image was taken are unknown. Dr. Pastore implicitly assumes that the image is free of distortion and that the MD thread runs perfectly horizontal. But since the photograph was taken for promotional purposes to illustrate a novel seam concept involving additional yarns, there is no reason to believe that special care was taken to ensure geometric accuracy or thread alignment.

82. Dr. Pastore provides no additional information regarding these potential sources of error or their impact on the measurement results. Additionally, the number, placement, and orientation of the green lines used to determine MDYD appear arbitrary and are not justified. Taken together, these methodological shortcomings render the measurements unreliable and unsuitable as a basis for establishing the claimed dimensional parameters.

3. Dr. Pastore Combines Features from Two Different Pictures

83. Once again, Dr. Pastore relies on pictures from two different photographs in Rydin and combines measurements and features across these photographs. However, there is no indication in Rydin that these pictures are from the same press felt. In contrast, it is readily apparent that Figure 2 and Figure 3 depict different objects. Figure 2 shows a sample of a pure woven fabric, while Figure 3 shows a finished felt with one or more batt layers needle punched into it.

The structural differences are obvious even to a lay observer, and a POSITA would immediately recognize that these are not the same material.

84. Moreover, Rydin does not even describe or analyze a specific press felt product. Rather, Rydin introduces a new design concept, namely, the integration of a special batt-like yarn into the base fabric. As the Rydin article headline indicates, the article discusses an entire new generation of press felts. There is no suggestion that Figures 2 and 3 refer to the same sample, nor that their geometric features are intended to be combined or compared.

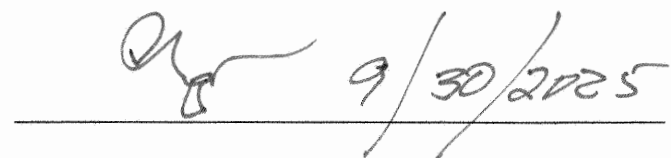
85. Accordingly, in my opinion, Dr. Pastore and Petitioner's attempt to derive dimensional values by combining measurements from two unrelated and uncalibrated images is speculative and methodologically unsound.

VI. CONCLUSION

87. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

88. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on the information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed:



David Brookstein, Sc.D.