

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Fitesa Simpsonville, Inc.
Petitioner,

v.

The Procter & Gamble Company,
Patent Owner.

Case IPR: 2023-XXXXX
U.S. Patent No. 10,513,801

PETITION FOR *INTER PARTES* REVIEW

PETITIONER'S EXHIBIT LIST

Exhibit Number	Document
1001	U.S. Patent No. 10,513,801
1002	U.S. Patent No. 6,013,223 – Schwarz
1003	PCT Application Publication No. WO 00/29658 – McDowall
1004	U.S. Patent Application Publication No. 2003/0211802 – Keck
1005	U.S. Patent No. 5,476,616 – Schwarz
1006	U.S. Patent No. 6,783,854 – Bond
1007	U.S. Patent No. 4,100,324 – Anderson
1008	U.S. Patent No. 4,923,454 – Seymour
1009	U.S. Patent No. 5,508,102 – Georger
1010	<i>The History of the Development of Melt Blowing Technology</i> , INJ 1999 – McCulloch
1011	<i>Melt Blown Dies: A Hot Innovation Spot</i> , INJ Winter 2002, 37-38 – Zhao
1012	File History U.S. Patent No. 10,513,801
1013	File History U.S. Patent No. 8,852,474
1014	File History U.S. Patent No. 9,926,648
1015	Declaration of Dr. Gajanan Bhat
1016	U.S. Patent No. 3,825,379 – Lohkamp
1017	U.S. Patent No. 4,380,570 – Schwarz
1018	U.S. Patent No. 6,114,017 – Fabbriante

1019	U.S. Patent No. 6,200,120 – Fish
1020	Assignment Record for U.S. Patent No. 5,476,616
1021	CV of Dr. Gajanan Bhat
1023	U.S. Patent No. 7,947,359 – Suzuka
1024	<i>ITMA 2007 Review: Implications for the Nonwovens Industry,”</i> J. of Engineered Fibers and Fabrics, Vol. 3, Issue 1 (2008), 38-47, 46 – Pourdeyhimi
1025	<i>Influence of Processing Conditions on Melt Blown Web Structure: Part 1 – DCD</i> , INJ Spring 2004, 49-55 - Bresee et al.
1026	<i>Influence of Processing Conditions on Melt Blown Web Structure: Part 2 – Primary Airflow Rate</i> , INJ Summer 2005, 11-18 - Bresee et al.
1027	<i>Effects of Melt-Blowing Process Conditions on Morphological and Mechanical Properties of Polypropylene Webs</i> , POLYMER 1992, Vol. 3, No. 6, 1200-1209 - Lee et al.
1028	Intentionally Left Blank
1029	U.S. Patent Application Publication No. 2007/0202766-Ouellette

I. INTRODUCTION

Pursuant to 35 U.S.C. §§311, 314(a), and 37 C.F.R. §42.100, Fitesa Simpsonville, Inc. (“Petitioner” or “Fitesa”) respectfully requests that the Board cancel Claims 1-25 of U.S. Patent No. 10,513,801 (“’801 Patent,” Ex. 1001).

II. MANDATORY NOTICES

A. Real Party-In-Interest

The real party-in-interest is Fitesa Simpsonville, Inc., having a principal place of business at 840 SE Main Street, Simpsonville, South Carolina, 29681.

B. Related Matters

Petitioner is not aware of any related matters at this time, as understood according to 37 CFR § CFR 42.8(b)(2).

C. Lead and Back-up Counsel Information

Lead Counsel

Patrick D. Kuehl, Jr. (Reg. No. 59,440)
Rimon Law
633 East 63rd Street, Ste 220
Kansas City, MO 64110
Tel/Fax: 816-839-7471
Patrick.Kuehl@rimonlaw.com

Backup Counsel

Timothy Balts (Reg. No. 51,429)
Rimon Law
10130 Perimeter Parkway, Ste 200
Charlotte, NC 28216
Tel/Fax: 704-631-3014
Timothy.Balts@rimonlaw.com

Pursuant to 37 C.F.R. § 42.10(b), a Power of Attorney accompanies this Petition. Please address all correspondence to lead and back-up counsel. Petitioner consents to service by email at the address above.

III. GROUNDS FOR STANDING

The '801 Patent is eligible for IPR and Petitioner is not barred or estopped from requesting this IPR. 37 C.F.R. § 42.104(a).

IV. PRECISE RELIEF REQUESTED

The Petitioner respectfully requests that claims 1-25 of U.S Patent No. 10,513,801 (“the '801 Patent”) (Ex. 1001) be cancelled based on the following grounds of patentability, explained in detail below:

Ground 1: Claims 1-3, 5-9, 12-25 are obvious under 35 U.S.C. §103 based on the teachings of U.S. Patent No. 6,013,223 to Schwarz (“Schwarz '223”) (Ex. 1002) and U.S. Patent App. Publication No. 2003/0211802 A1 to Keck (“Keck”) (Ex. 1004).

Ground 2: Claims 1-3, 5-9, 12-25 are obvious under 35 U.S.C. §103 based on the teachings of U.S. Patent No. 5,476,616 to Schwarz (“Schwarz '616”) (Ex. 1005) and Keck (Ex. 1004).

Ground 3: Claims 1-3, 5-9, 14-15, and 20-25 are obvious under 35 U.S.C. §103 based on the teachings of Schwarz '223 (Ex. 1002) and PCT Application Publication No. WO 00/29658 to McDowall (“McDowall”) (Ex. 1003).

Ground 4: Claims 10-11 are obvious under 35 U.S.C. §103 based on the teachings of Schwarz '223 and Keck (or McDowall) in further view of U.S. Patent No. 6,783, 854 to Bond (“Bond”).

Ground 5: Claims 1-4, 6-9, 12-20, 22-25 are obvious under 35 U.S.C. §103 based on the teachings of Keck (Ex. 1004) in view of U.S. Patent No. 6,114,017 to Fabbicante (“Fabbicante”) (Ex. 1018).

Ground 6: Claim 21 is obvious under 35 U.S.C. §103 under 35 U.S.C. §103 based on the teachings of Schwarz '223 (Ex. 1002) in view of Keck (Ex. 1004) or McDowall (Ex. 1003), and in further view of United States Patent Application Publication No. 2007/0202766 to Ouellette et al. (“Ouellette”) (Ex. 1028).

V. THE '801 PATENT

A. SPECIFICATION

The '801 Patent relates to processes for making fibrous structures comprising filaments. Ex. 1001, column 1, lines 6-8; These fibrous structures include paper, fabrics, absorbent pads, diapers, feminine hygiene products, and the like. *Id.*, column 3, lines 12-16. The '801 Patent claims a “coform” process for making fibrous structures, which means that the fibrous structures comprise a mixture of two different materials – polymer filaments and a solid additive such as wood pulp fibers. *Id.*, column 1, lines 12-14; column 3, lines 41-49; Claim 1.

More specifically, the '801 Patent claims a coform process whereby a plurality of polymer filaments are extruded from a die and contacted with a fluid, such as air, after which the polymer filaments are combined with solid additives, such as wood pulp, and the mixture is collected on a surface to form a fibrous structure. Ex. 1001, Claims 1, 25. The process is visualized in figure 10 (shown below). Polymer filaments 12 are created from a melt blow die 68 and mixed with a plurality of solid additives 14 supplied by a solid additive spreader 67 and collected on a collection device such as a belt 70. *Id.*, column 13, lines 18-32.

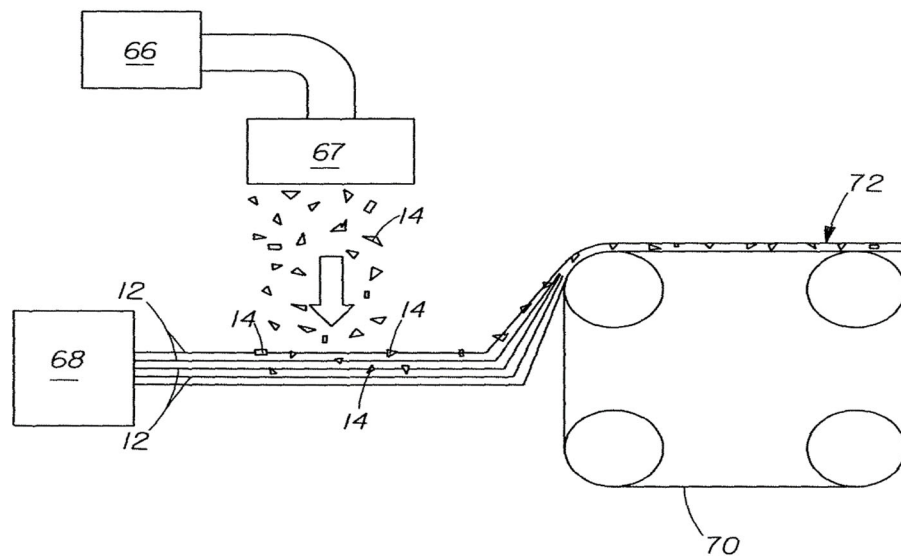


Fig. 10

The coform process in general is not new. *See, e.g.*, U.S. Patent No. 4,100,324 to Anderson (Ex. 1007) (directed to a coform process, wherein polymers, such as polypropylene, are initially formed by a primary airstream containing melt-blown microfibers and combined with additives, such as wood pulp fibers; U.S.

Patent No. 4,923,454 to Seymour (Ex. 1008) (directed to a structure comprising an extended web of meltblown microfibers made from thermoplastic copolymers and combined with additives, such as staple fibers); U.S. Patent No. 5,508,102 to Georger (Ex. 1009) (directed to a fibrous nonwoven structure made from a coform process that provides for extruded polymers forming a nonwoven web and combined with cellulosic additives). *see* also Ex. 1015, Declaration of Dr. Gajanan Bhat, ¶¶ 26-32. Coform nonwovens have been used for decades in single-use disposable consumer products, including and most prevalently in baby wipes. Ex. 1015, Bhat Declaration, ¶ 32.

A step in the coform process claimed in the '801 Patent is making polymer filaments. The '801 Patent discloses polymer filaments made from both meltblown and spunbond processes. Ex. 1001, column 3, line 67-column 4, line 1.

In a meltblown process, polymers (typically thermoplastics), are heated and extruded through die openings into thin, fine fibers and are attenuated by a fluid (air) to produce fibers having diameters typically ranging from 1 to 10 microns. Ex. 1015, Bhat Declaration, ¶ 27. A meltblown process can be designed with a single row of die openings or multiple rows of die openings. *Id.*, ¶¶ 37-38.

In the spunbond process, a molten thermoplastic material is extruded as filaments from a plurality of fine, usually circular, capillaries (filament forming holes) of a spinneret, with the filaments then being attenuated and drawn

mechanically or pneumatically. *Id.* ¶ 47. The filaments are deposited on a collecting surface to form a web of randomly arranged substantially continuous filaments which can thereafter be bonded together to form a coherent nonwoven fabric. *Id.* Generally, the spinneret die includes a plurality of rows of capillaries with each row comprising from 50 to 500 capillaries. *Id.*

Both meltblown and spunbond processes were well known in the art long before the earliest priority date of the '801 Patent. Ex. 1015, Bhat Declaration, ¶¶ 27, 47. The meltblown process began development around the middle of the 20th century. *See* McCulloch, *The History of the Development of Melt Blowing Technology*, (Ex. 1010). For example, the concept of meltblowing thermoplastics was first introduced to the public in 1954 through a (U.S.) Naval Research Laboratory project. McCulloch, Ex. 1010; *see also* *Melt Blown Dies: A Hot Innovation Spot*, INJ Winter 2002, 37-38 (“Zhao”)(Ex. 1011).

The concept of spunbond fabric production developed in the late 1950s, but it was not until the mid-1960s to the early 1970s that the full commercial potential of the spunbond technology was fully recognized. Ex. 1015, Bhat Declaration, ¶ 47. *See also* G. S. Bhat et al., Polymer-laid web Formation, *Handbook of Nonwovens*, edited by S.J. Russel, Woodhead Publishing Limited, (2007), 149-150, (Ex. 1022).

As the main elements of the '801 Patent were long known in the art, the '801

Patent contains claims directed to specific configurations of filament-forming holes, fluid-releasing holes, and particular materials for the filaments and solid additives. As discussed in the “Prosecution History” section below, patentability of the claims in the grandparent application (’474 Patent) was focused on the angle between the extruded fibers and the impinging fluid (air) (less than 30° and parallel or substantially parallel). The main difference between the ’474 Patent and the ’801 Patent is the angle, which is less than 10° in the ’801 Patent. The examiner did not analyze five of the six prior art references presented in this Petition during prosecution of the grandparent or of the ’801 Patent. As detailed further below, all of the claims of the ’801 Patent are obvious.

B. PROSECUTION HISTORY

The ’801 Patent, generally directed towards methods of making a fibrous structure, was filed with 25 claims by The Procter & Gamble Company on February 8, 2018 as a continuation of U.S. application No. 14/475,699, now Patent No. 9,926,648 (“’648 Patent”), which is a continuation of U.S. application No. 12/170,575, now Patent No. 8,852,474 (“’474 Patent”). Ex. 1001.

There was a single office action during prosecution of the ’801 Patent, with a double patenting rejection. Prosecution history of U.S. Patent No. 10,513,801, Ex. 1012 at 31-36. Applicant traversed the rejection with a terminal disclaimer and the ’801 Patent issued on December 24, 2019. *Id.*, at 25-30.

1. Grandparent - The '474 Patent

On July 10, 2008, applicant filed the application that became the '474 Patent, which is the grandparent of the '801 Patent at issue in this IPR. Prosecution history of U.S. Pat. No. 8,852,474, Ex. 1013, at 548. The '474 Patent claims priority to Provisional Application No. 60/959,885, filed on July 17, 2007. *Id.* The 18 surviving claims of the '474 Patent (23 claims were filed originally) are nearly identical to 18 of the 25 claims of the '801 Patent, with the only material change being the angle referenced in Claim 1 (“angle less than 30°” changed to “angle less than 10°”). The seven claims of the '801 Patent not found in the '474 Patent (Claims 6-8 and 10-13) are dependent claims directed to specific polymers used in the process described in Claim 1. Ex. 1001.

On May 29, 2009, Claims 1-23 were rejected over the prior art, with Claims 1-3, 6-9, 12-13, 18, and 21-23 being rejected as anticipated over Radwanski et al. (EP 0333209) (“Radwanski”). Ex. 1013, at 425-433. Claims 4-5, 10-11, 14-17, and 19-20 were rejected as obvious. *Id.* The Applicant responded, arguing that Radwanski fails to teach using a die with fluid releasing holes such that fluid exiting one or more fluid releasing holes is parallel or substantially parallel to an exterior surface of a filament. *Id.*, at 419-422. The examiner found this argument persuasive, but issued new rejections. *Id.*, at 406-412.

On October 1, 2009, the Examiner rejected Claims 1-23, finding Claims 1-4,

6-9,12-13, 18, and 21-23 as obvious over Radwanski, and further in view of Schwarz (US 5,476,616) (“Schwarz ’616”) (Ex. 1005). *Id.* The Examiner stated that while Radwanski does not teach that a fluid exiting the fluid-releasing hole is parallel or substantially parallel to an exterior surface of a filament, Schwarz disclosed air flown parallel to an extruded fiber, and it would be obvious to combine the teachings of Radwanski and Schwarz to arrive at the relevant claims. *Id.*, at 406-412. Applicant disagreed, arguing that the references could not be combined as suggested, as Radwanski requires converging flows of high velocity, heated gas to break the polymer streams into fibers of relatively small diameter and that replacing the converging flows taught by Radwanski with the parallel flows taught by Schwarz would render Radwanski inoperable because it would not function for its intended purpose – to break polymer streams into fibers. *Id.*, at 400-402.

On March 11, 2010 the Examiner issued a final rejection, maintaining the previous rejections. *Id.*, at 384-394. The PTO issued an Advisory Action on May 19, 2010, stating that the applicant’s response did not place the application in condition for allowance. *Id.*, at 374-376.

Applicant filed a Request for Continued Examination (RCE) and an amendment adding the step d. to both independent claims. *Id.*, at 359-368. Applicant again made the same argument that the combination of Radwanski with Schwarz would make Radwanski inoperable. *Id.*

On August 7, 2013, the Examiner again rejected all claims as obvious, this time focusing on Schwarz '616 in view of Radwanski. *Id.*, at 155-164. The Examiner characterized this as a newly formulated rejection and, thus, found applicant's "inoperability" argument moot. *Id.*

In response, applicant amended the claims to specify the claimed process was for "a sanitary tissue product useful as a wiping implement," arguing that Radwanski is not directed to such products and further that Schwarz and Radwanski teach away from one another. *Id.*, at 121-129.

In a final rejection on November 21, 2013, the PTO maintained the rejections of all claims. *Id.*, at 103-115. The Examiner further added Fare (US 2001/0019931) to the combination of Schwarz and Radwanski for the teaching that polypropylene materials used in both Radwanski and Schwarz are used for sanitary feminine napkins and incontinence articles. *Id.* As such, the Examiner found it proper to combine the teachings of the references. *Id.*

Applicant responded by cancelling Claims 6-8 and 10-11 and amending the remaining claims to removing reference to sanitary tissues and reinserting reference to fibrous structures. Applicant again argued the references should not be combined, as the turbulent conditions described in Radwanski would interfere with the spinning nozzles of Schwarz to achieve uniform fiber formation. *Id.*, at 91-99.

On March 13, 2014, the Examiner issued a non-final office action removing

the rejection based on Schwarz and Radwanski (and Fare), and asserting a new rejection to Claims 1, 9, 12-14, 18, and 20-23 as anticipated by Anderson (Exhibit 1007). *Id.*, at 79-86. The Examiner asserted obvious rejections for the remaining claims. In response, Applicant argued that Anderson fails to teach a die that includes one or more fluid releasing holes associated with one filament-forming hole such that a fluid exiting a fluid releasing hole is parallel or substantially parallel to a filament exiting a filament-forming hole. *Id.*

On April 21, 2014, a final office action was issued, maintaining the rejections. The Examiner noted that Anderson teaches (especially figure 1) providing a die (11) including one or more filament-forming holes (column 2, line 45, “at least one straight row of extrusion apertures”), wherein one or more fluid releasing holes (nozzles 12 (below the row of apertures) and 13 (above the row of apertures)) are associated with one filament-forming hole such that a fluid exiting the fluid-releasing hole is parallel or substantially parallel to an exterior surface of a filament exiting the filament-forming hole (the fluid stream(10) is parallel to a longitudinal axis of the die; note also that fluid stream 14 is perpendicular to fluid stream 10 (column 4, lines 18-20)). *Id.*, at 55-62.

The Examiner conducted a telephonic interview and stated that Anderson meets the “parallel or substantially parallel” language of Claim 1, since “figure 1 [of Anderson] shows fluid releasing holes (12, 13) such that the fluid exiting from holes

12, 13) has a parallel component (note that the fluid stream 10 exiting the die 11 has a parallel component to the longitudinal axis of the die 11).” *Id.*, at 25-27. The Examiner also stated that he would consider claim amendments.

The Applicant responded by amending the claims removing reference to “parallel or substantially parallel” from element “a.” in both independent Claims 1 and 23 and replacing it with an “angle less than 30°”. *Id.*, at 28-37. On June 9, 2014, a Notice of Allowability (NOA) was mailed, but the NOA did not provide reasons for the allowance of the claims. *Id.*, at 16. That is, the NOA did not state why an angle of less than 30° overcame Anderson, which the Examiner previously noted met the language of “parallel or substantially parallel”; parallel equals an angle of 0°, which is less than 30°. *Id.* The ’474 Patent issued on October 7, 2014. *Id.*, at 1.

2. The ’648 Patent

On September 3, 2014, applicant filed the application that became the ’648 Patent, which is the parent of the ’801 Patent at issue in this IPR. The 18 surviving claims of the ’648 Patent (20 claims were filed originally) are similar to the claims of the ’801 Patent and involve the same general process.

VI. DISCRETIONARY DENIAL INAPPROPRIATE

The *Becton Dickinson* factors weigh in favor of institution under 35 U.S.C. §325(d). First, this Petition relies on references not identified or evaluated during any stage of the prosecution of the ’801 Patent. Under 35 U.S.C. §325(d), the art and

arguments must have been previously presented to the Office during prosecution for discretionary denial to be appropriate. *See Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6, at 8 (PTAB Feb. 13, 2020) (precedential). This Petition thus presents new issues warranting an exercise of discretion to institute trial. 35 U.S.C. §325(d).

Five of the six grounds asserted rely upon references that were not cited in an IDS and were not evaluated in any manner (Schwarz '223, McDowall, Bond, Fabbriante, and Ouelette). None of these references were before the Examiner, nor are they cumulative of art the Examiner considered (the Examiner did not evaluate any art or issue any rejections during prosecution of the '801 Patent).

Schwarz '616 and Keck were disclosed in an IDS along with 259 other references during prosecution of the '801 Patent, but they were not substantively evaluated by the Examiner. The Examiner erred by not substantively evaluating them, because, as shown below, they invalidate the claims of the '801 Patent. *See Scientific Design Co. v. Shell Oil Co.*, IPR2021-01537, Paper 7 (P.T.A.B. Mar. 18, 2022) and IPR2022-00158, Paper 7 (P.T.A.B. Apr. 4, 2022).

The Examiner further erred in not using Schwarz '616 as a basis for rejection for the claims of the '801 Patent because the examiner found during prosecution of the '474 Patent that Schwarz '616 disclosed air flow parallel to an extruded fiber. The '801 Patent claims an angle of less than 10,° which must be substantially

parallel. *See* claim construction of “substantially parallel” below. Had the Examiner properly evaluated Schwarz ’616, Keck, or the other references not cited that are presented in this Petition, the Examiner would not have allowed the claims.

VII. LEVEL OF SKILL

A person of ordinary skill in the art (POSA) at the time of the effective filing date of the application that led to the ’801 Patent would have been a person with a Bachelor of Science degree in Engineering (or a substantively related engineering or science degree) or equivalent work experience, and/or at least 3 to 5 years of experience in the field of nonwovens. Such experience could include, but is not necessarily required to include, knowledge about the design and operation of meltspun systems, such as meltblown and spunbond systems. Ex. 1015, Bhat Declaration, ¶ 11.

VIII. CLAIM CONSTRUCTION

Words in a claim are given their plain meaning, as understood by a POSA in view of the patent and file history. 37 C.F.R. §42.100(b); 83 Fed. Reg. 197, 51340 (Oct. 11, 2018); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (*en banc*). Other than following terms, Petitioner proposes no claim language requires express construction to resolve this Petition.

A. Substantially Parallel

Step a. of both independent Claims 1 and 25 require that a fluid exiting the

fluid-releasing hole contacts an exterior surface of a filament exiting the filament-forming hole at an angle of less than 10°, while step d. requires supplying a fluid to the die such that the fluid exits the one or more fluid-releasing holes parallel or substantially parallel to the exterior surface of at least one of the filaments. The fluid referenced in steps a. and d. must be the same fluid, since step d. provides a fluid to the die, which was defined in step a. Ex. 1015, Bhat Declaration, ¶¶ 54-55. Since the fluid referenced in steps a. and d. is the same fluid, the angle at which the fluid contacts the exterior surface of the filaments in steps a. and d. is the same angle. *Id.* Step d. requires that angle to be “substantially parallel” while step a. requires it to be less than 10°. Ex. 1001, Claims 1 and 25. Since the same angle must be both “substantially parallel” and less than 10°, for the purposes of interpreting the claims, “substantially parallel” must mean an angle of less than 10°. *Id.*

B. Polypropylene

The term “polypropylene” as used in the ’801 Patent, must be a polyolefin because Claim 9 of the ’801 Patent claims a polyolefin that comprises polypropylene. Ex. 1001, Claim 9. Moreover, polypropylene is a particular type of polyolefin. Ex. 1015, Bhat Declaration, ¶ 56.

C. Synthetic Polymer

The term “synthetic polymer” as used in the ’801 Patent must include

polyolefins, polyesters, and polylactic acids because Claim 7 of the '801 Patent claims a synthetic polymer selected from the group including polyolefins, polyesters, and polylactic acids. Ex. 1001, Claim 7. Moreover, polyolefins, such as polypropylene, are considered to be a synthetic polymer. Ex. 1015, Bhat Declaration, ¶ 57.

D. Natural Polymer

The term “natural polymer” as used in the '801 Patent (Claims 10-11) must include starch, starch derivatives, cellulose, cellulose derivatives, hemicellulose, hemicellulose derivatives, and mixtures thereof because Claim 11 of the '801 Patent claims a natural polymer selected from the group consisting of starch, starch derivatives, cellulose, cellulose derivatives, hemicellulose, hemicellulose derivatives, and mixtures thereof. Ex. 1001, Claim 11. Moreover, starches and cellulose are natural polymers. Ex. 1015, Bhat Declaration, ¶ 58.

E. Compostable Polymer

The term “compostable polymer” as used in the '801 Patent (Claims 12-13) must include polylactic acids, polyhydroxyalkanoates, polycaprolactones and mixtures thereof because Claim 13 of the '801 Patent claims a compostable polymer selected from the group consisting of polylactic acids, polyhydroxyalkanoates, polycaprolactones and mixtures thereof. Ex. 1001, Claim 13. Ex. 1015, Bhat Declaration, ¶ 59.

F. Post Processing Operation

Claims 23 and 24 include a “post processing operation.” The specification of the ’801 Patent does not define “post processing operation,” but gives examples:

The fibrous structures of the present invention and/or any sanitary tissue products comprising such fibrous structures may be subjected to any post-processing operations such as embossing operations, printing operations, tuft-generating operations, thermal bonding operations, ultrasonic bonding operations, perforating operations, surface treatment operations such as application of lotions, silicones and/or other materials and mixtures thereof.

Ex. 1001, column 9, lines 31-38. “Post processing operation” must, therefore, be defined to include tuft-generating operations, thermal bonding operations, and the application of lotions and other materials or mixtures. Ex. 1015, Bhat Declaration, ¶ 60.

G. Second Polymer

The definition of “second polymer” must include the second polymer being the same as the first polymer because Claim 19 of the ’801 Patent, which depends on Claim 17, recites that the first and second polymer are the same. Ex. 1001, Claim 19.

H. Solid Additive Spreader

The ’801 Patent defines the term “solid additive spreader” as a device that comingles air with pulp or other solid additives and injects the mixture into the stream of meltblown filaments. Ex. 1001, column 16, lines 9-60.

IX. PRIOR ART

A. U.S. Patent No. 6,013,223 (“Schwarz ’223”) (Ex. 1002)

Entitled “Process and Apparatus for Producing Non-Woven Webs of Strong Filaments,” Schwarz ’223 issued January 11, 2000. Ex. 1002, p. 1. Schwarz ’223 was not cited or discussed by the examiner during prosecution. Schwarz ’223 qualifies as prior art to the ’801 Patent under 35 U.S.C. § 102(b) and (e)(pre-AIA).

Schwarz ’223 relates to an apparatus and process for extruding fiber forming thermoplastic polymers through multiple rows of spinning nozzles to produce a nonwoven web of high strength fibers. Ex. 1002, abstract. Schwarz ’223 is concerned with the same field of endeavor as inventions claimed in the ’801 Patent. Ex. 1015, Bhat Declaration, ¶ 109. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004)(a reference is analogous art if from the same field of endeavor as the claimed invention). Schwarz ’223’s disclosures are also reasonably pertinent to the problems which the application sought to solve, such that Schwarz ’223 would “logically [] have commended itself to an inventor’s attention in considering his problem.” *In re ICON Health and Fitness, Inc.*, 496 F.3d 1374, 1379-80 (Fed. Cir. 2007).

B. PCT Published Application No. WO 00/29658 (“McDowall”) (Ex. 1003)

Entitled “Pulp-Modified Bicomponent Continuous Filament Nonwoven Webs,” McDowall was published May 25, 2000. Ex. 1003, at 1. McDowall was

not cited or discussed by the Examiner during prosecution. McDowall qualifies as prior art to the '801 Patent under 35 U.S.C. § 102(b) (pre-AIA).

McDowall is directed to a coform nonwoven and processes of preparing the same. Ex. 1015, Bhat Declaration, ¶ 81. Accordingly, McDowall is in the same field of the endeavor or the '801 patent. *Id.*

McDowall describes a process of preparing an absorbent nonwoven web comprising a combination of substantially continuous bicomponent thermoplastic filaments and pulp fibers. Ex. 1003, abstract. McDowall states that the continuous filaments may be combined with pulp fibers using a coform process. *Id.*, page 10, lines 1-6. In the coform process, a solid additive, such as pulp fibers, are comingled with a stream of thermoplastic filaments prior to the mixture of filaments and pulp fibers being deposited on a collection surface. Ex. 1015, Bhat Declaration, ¶ 82. More specifically, a plurality of filaments are extruded from a die head having multiple die openings (e.g., filament nozzles) to form a filament stream. *Id.* A stream comprising a gas and a solid additive, such as wood pulp, is introduced into the filament stream at which point the solid additives comingle and merge with the filaments in the filament stream. *Id.* The resulting integrated stream is then deposited onto a collection surface. McDowall describes that the integrated stream of continuous filaments and pulp fibers were deposited on web forming conveyor

and then subsequently subjected to a step of through-air bonding. Ex. 1003, at 16, lines 2-6.

Notably, McDowall states that the continuous filaments may be, without limitation, spunbonded or meltblown fibers. *Id.*, page 6, lines 1-3. McDowall states that “meltblown fibers used in the present invention are substantially continuous in length. *Id.*, at 4, lines 19-20. McDowall describes that the pulp fibers may be of high average fiber length (e.g., lengths greater than 1.5 mm), low average fiber length (e.g., lengths less than about 1.5 mm), and mixtures thereof. *Id.*, at 10, lines 10-21.

C. U.S. Patent App. Publication No. 2003/0211802 A1 (“Keck”) (Ex. 1004)

Entitled Three-Dimensional Coform Nonwoven Web,” Keck was published November 13, 2003. Ex. 1003, at 1. Keck was not cited or discussed by the examiner during prosecution. Keck qualifies as prior art to the ’801 Patent under 35 U.S.C. § 102(b) and (e)(pre-AIA).

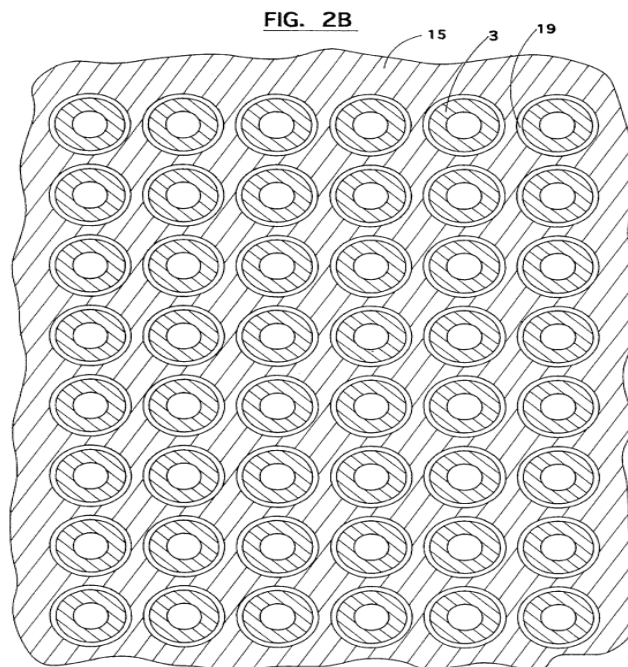
Keck is concerned with the same field of endeavor as inventions claimed in the ’801 Patent. Ex. 1015, Bhat Declaration, ¶ 91. Keck relates to a coform nonwoven web, prepared from thermoplastic filaments and at least one secondary material. Ex. 1004, ¶ 0002. Coform nonwoven webs have been used in applications such as disposable absorbent articles, absorbent dry wipes, wet wipes, wet mops, cleaning pads, and the like. Ex 1004, ¶ 0006.

D. U.S. Patent No. 5,476,616 (“Schwarz ’616”) (Ex. 1005)

Entitled “Apparatus and Process for Uniformly Melt-Blowing a Fiberforming Thermoplastic Polymer in a Spinnerette Assembly of Multiple Rows of Spinning Orifices,” Schwarz ’616 issued on December 19, 1995. Schwarz ’616 qualifies as prior art to the ’801 Patent under 35 U.S.C. § 102(b) and (e)(pre-AIA).

Schwarz ’616 is directed to an apparatus and method for preparing meltblown fibers and nonwovens comprising meltblown fibers. As such, Schwarz ’616 is in the same field of the endeavor or the ’801 patent. Ex. 1015, Bhat Declaration, ¶ 65.

Schwarz ’616 is directed to an improvement of the meltblown die head and the process described in U.S. Patent No. 4,380,570 to Schwarz (Ex. 1017). Ex. 1005, column 1, lines 9-12. Schwarz ’616 describes a multirow meltblown die in which each filament nozzle is concentrically surrounded by an air orifice. *Id.*, abstract.



During fiber extrusion, a molten polymeric resin is fed via an extruder to supply cavity 2, which in turns supplies the molten polymeric resin to the plurality of filament nozzles 3. *Id.*, column 2, lines 15-19. Gas enters the gas cavity 5 via the air inlet 7 and then flows through gas holes 18 in plate 11 into a second gas cavity 14 and then around the nozzles 3 through holes 19 and 20 in which the nozzles are centered. *Id.*, column 2, lines 41-46. As the gas exits holes 19 and 20, it is flowing parallel to the main axis of the filament nozzles. That is, as the gas exits the holes in the cover plates, the gas is flowing parallel to the filaments as they are extruded from filament nozzles 3. Consequently, the gas (e.g., air) contacts the surfaces of the filaments as they exit the filament nozzles at an angle that is less than 10°.

E. U.S. Patent No. 6,783,854 to Bond (“Bond”) (Ex. 1006)

Entitled “Bicomponent Fibers Comprising A Thermoplastic Polymer Surrounding a Starch Rich Core,” Bond issued on August 31, 2004. Bond qualifies as prior art to the ’801 Patent under 35 U.S.C. § 102(b) and (e)(pre-AIA). Bond was not disclosed during prosecution of the patent application.

Bond is directed to continuous bicomponent fibers that may be used in the preparation of meltblown and spunbond nonwoven fabrics. Ex. 1006. Bond teaches that the bicomponent filaments may be made with melt spinning processes, and may be used to produce continuous filaments through spunbond methods or meltblowing processes. *Id.*, column 12, line 61-column 13, line 4. Bond further teaches that the nonwovens prepared from the bicomponent fibers may be used in hygiene applications, which includes wipes and diapers. *Id.*, column 14, lines 30-45. Bond is concerned with the same field of the endeavor or the ’801 Patent. Ex. 1015, Bhat Declaration, ¶ 122.

F. U.S. Patent No. to 6,114,017 (“Fabbicante”) (Ex. 1018)

Entitled “Micro-Denier Nonwoven Materials Made Using Modular Due Units,” Fabbicante issued on September 5, 2000. Fabbicante qualifies as prior art to the ’276 Patent under 35 U.S.C. § 102(b) and (e)(pre-AIA). Fabbicante was not disclosed during prosecution of the patent application.

Fabbricante is directed to nonwoven webs and processes for their production. Accordingly, Fabbricante is in the same field of the endeavor or the '276 Patent. Ex. 1015, Bhat Declaration, ¶ 130.

Fabbricante describes a modular multirow meltblown die for preparing continuous meltblown filaments. Ex.1018, abstract. Fabbricante teaches that the modular multirow meltblown die produces meltblown webs having equal or superior strength properties to nonwoven fabrics prepared with spunbond processes. *Id.*, abstract, column 2, lines 7-10. Fabbricante further teaches that the meltblown webs prepared with the modular multirow die also exhibit significantly higher unbonded strength than a typical meltblown web. *Id.*, column 4, lines 1-10.

Fabbricante also discloses that the modular multirow meltblown die provides economic advantages. Fabbricante teaches that it is well known in the nonwoven industry that in order to be competitive in meltblowing polymers, a minimum polymer flow rate per die hole must be maintained. *Id.*, column 1, lines 63-67. To meet this minimum polymer flow rate requirement, it may be necessary to use additional dies or beam to produce the nonwovens at a commercially acceptable rate. *Id.*, column 2, lines 1-2. However, traditional meltblown beams are very expensive to produce. *Id.*, column 2, lines 2-7.

The multirow meltblown die of Fabbricante provides a solution to this problem. In particular, Fabbricante teaches that because of the “inherent economies

of manufacture,” the modular meltblown die allows multiple rows of die holes without high capital costs. *Id.*, column 3, lines 11-14. Notably, Fabbicante discloses that the cost of manufacture of the modular meltblown die is about 10 to 20% of the cost of an equivalent die, in which the die block is traditionally machined. *Id.*, column 3, lines 6-9.

G. United States Patent Application Publication No. 2007/0202766 to Ouellette et al. (“Ouellette”) (Ex. 1029)

United States Patent Application Publication No. 2007/0202766 to Ouellette et al. (“Ouellette”) (Ex. 1029), entitled “Low Density Cleaning Substrate” published on August 30, 2007, and was filed on February 24, 2006. Ouellette qualifies as pre-AIA prior art to the ’801 Patent under 35 U.S.C. § 102(e)(1).

Ouellette is directed to a cleaning substrate comprising a nonwoven material, such as a meltblown or coform. Ex. 105, Bhat Declaration, ¶ 148. Accordingly, Ouellette is in the same field of the endeavor or the ’276 Patent. *Id.*

Ouellette discloses a nonwoven substrate that is particularly useful as a cleaning wipe. Ex. 1029, ¶¶ 0017, 0020. The nonwoven substrate has an optimized pore volume distribution in which at least 50 percent of the cumulative volume within the pores have a radius size of about 110 to 250 microns. *Id.*, abstract. Ouellette teaches that the optimized pore volume distribution of the substrate enables it to controllably release a fluid composition effectively onto a surface. *Id.*

Ouellette teaches that the substrate is a nonwoven material which may

comprise a spunbond, meltblown, or coform nonwoven among others. *Id.*, ¶ 0019. Ouellette further teaches that the meltblown fibers may be continuous or discontinuous. *Id.*, ¶ 0041. Ouelette teaches that “the fibrous web or substrate may comprise natural fibers, synthetic fibers, polypropylene, polyethylene, polyester, PET, wood pulp, regenerated cellulose nylon, cotton, bicomponent fibers, continuous fibers, and combinations thereof...”. *Id.*, ¶ 0058.

X. IDENTIFICATION OF HOW CLAIMS ARE UNPATENTABLE

A. Challenged Claims and Statutory Grounds

This Petition presents four grounds of unpatentability:

Ground	Claims	Basis (Pre-AIA 35 U.S.C. § 103)
1	1-3, 5-9, 12-25	Schwarz '223 in view of Keck
2	1-3, 5-9, 12-25	Schwarz '616 in view of Keck
3	1-3, 5-9, 14-15, 20-25	Schwarz '223 in view of McDowall
4	10, 11	Schwarz '223 in view of Keck or McDowall in further view of Bond
5	1-4, 6-9, 12-20, 22-25	Keck in view of Fabbricante
6	21	Schwarz' 223 in view of Keck or McDowall in further view of Ouellette

B. Ground 1: Claims 1-3, 5-9, 12-25 are Obvious over Schwarz '223 in View of Keck

1. Independent Claims 1 and 25

Schwarz '223 teaches an apparatus and process for extruding fiberforming thermoplastic polymers through multiple rows of spinning nozzles to produce a nonwoven web of high strength fibers. Ex. 1002, abstract. The molten fibers are

accelerated by expanding hot gas (air) flowing parallel to the extrusion nozzles and the fibers. *Id.*

Schwarz '223 explicitly discloses all but one element of independent Claims 1 and 25 of the '801 Patent. The remaining element – combining the filaments with solid additives (wood pulp) to form a mixture – was well known in the art (see below) and would have been obvious to a POSA based on Schwarz's disclosures in light of the teachings of Keck. An element-by-element analysis follows:

Preamble: A process for making a fibrous structure, the process comprising the steps of:

Schwarz '223 teaches a process for making a fibrous structure. Ex. 1002, abstract, Claim 1.

Element a (Claims 1 and 25): providing a die comprising one or more filament-forming holes, wherein one or more fluid-releasing holes are associated with one filament-forming hole such that a fluid exiting the fluid-releasing hole contacts an exterior surface of a filament exiting the filament-forming hole at an angle of less than 10°

Schwarz '223 discloses a die body (Ex. 1002, column 2, line 31) through which pressurized hot air is blown out of holes (fluid releasing holes) around each spinning nozzle (filament-forming hole) at a high velocity parallel (angle of less than 10°) to the fibers. Ex. 1002, column 1, lines 58-60; column 2, lines 30-35; figures 1, 2.

Element b (Claim 1): supplying at least a first polymer to the die

Element b (Claim 25): supplying a polyolefin polymer to the die

Schwarz '223 discloses supplying thermoplastic fiber-forming polymer melt (first polymer) to a supply cavity in a die body (die). Ex. 1002, column 2, lines 30-32. More particularly, Schwarz '223 discloses supplying polypropylene (first polymer) to the die body (die). Ex. 1002, column 2, line 65. Polypropylene is a particular type of polyolefin. This must be true because dependent Claim 9 of the '801 Patent claims a polyolefin that comprises polypropylene. *See also* Ex. 1015, Bhat Declaration ¶ 118.

Element c (Claims 1 and 25): producing a plurality of filaments comprising the first polymer from the die

Schwarz '223 discloses producing strong filaments (Ex. 1002, column 1, lines 10-12) by supplying thermoplastic fiber-forming polymer (first polymer) to a supply cavity on a die body (die). Ex. 1002, column 2, lines 30-39.

Element d (Claims 1 and 25): supplying a fluid to the die such that the fluid exits the one or more fluid-releasing holes parallel or substantially parallel to the exterior surface of at least one of the filaments

Schwarz '223 discloses a die body (Ex. 1002, column 2, line 31) through which pressurized hot air (fluid) is blown out of holes (fluid releasing holes) around each spinning nozzle (filament-forming hole) at a high velocity parallel to the fibers (filaments). Ex. 1002, column 1, lines 58-60; column 2, lines 30-35; figures 1, 2.

Element f (Claims 1 and 25): collecting the mixture on a collection device to produce a fibrous structure.

Schwarz '223 discloses collecting said fibers on a receiver surface (collection device) to form a nonwoven mat (fibrous structure). Ex. 1002, Claim 1 (column 5, lines 34-36).

Element e (Claim 1): combining the filaments with solid additives to form a mixture

Element e (Claim 25): combining the filaments with wood pulp fibers to form a mixture

This is the only element of independent claims 1 and 25 that is not explicitly disclosed in Schwarz '223. But adding solid additives, or specifically wood pulp fibers, to polymer filaments to form a mixture has been long known in the art (referred to as coform), and is explicitly disclosed in Keck as known in the art. Ex. 1004, ¶ 0003. Keck expressly discloses that the secondary material (solid additives) includes woody pulp. *Id.*

a. Motivation to Combine

Prior to the patent owner's earliest possible priority date (July 17, 2007), a POSA would have been motivated to modify Schwarz '223 in view of Keck in order to provide a coform nonwoven having lower costs and exhibiting improved strength. Schwarz '223 and Keck are both analogous to the invention claimed in the '801 Patent because they concern the same field of endeavor. Ex. 1015, Bhat Declaration, ¶¶ 91, 109.

A “motivation to combine may be found explicitly or implicitly in market forces; design incentives; the ‘interrelated teachings of multiple patents’; ‘any need or problem known in the field of endeavor at the time of invention and addressed by the patent’; and the background knowledge, creativity, and common sense of the person of ordinary skill.” *Zup v. Nash Mfg.*, 896 F.3d 1365, 1371 (Fed. Cir. 2018) (quoting *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1354 (Fed. Cir. 2013)).

In this case, a POSA would have known that the multirow meltblown die taught in Schwarz ’223 provides significant improvements with respect to throughput, and hence, productivity. Ex. 1015, Bhat Declaration ¶¶ 78-79, 165. As a consequence, the costs associated with manufacturing the coform nonwoven per unit would be decreased, which would improve the manufacturer competitiveness in the market and potentially provide a greater return on investment. *Id.* In addition, a POSA would be motivated to modify Schwarz ’223 in view of Keck in order to improve the strength of the coform nonwoven. *Id.*, ¶ 166. Schwarz ’223 explicitly states that the fibers prepared therein have improved tenacity. *Id.* As such, a POSA would have been motivated to modify Schwarz ’223 in view of Keck to provide a coform nonwoven having improved strength. *Id.*

b. Reasonable Expectation of Success

A POSA would have had a reasonable expectation of success in combining Schwarz ’223 and Keck. The simple substitution of a multirow meltblown die in

lieu of a knife-edge meltblown die in the coform process would be within the routine skill of the POSA and such a substitution would not result in the coform process of Keck being inoperable. *Id.*, ¶ 161; *see also KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007)(reasonable expectation shown where POSA could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007)(reasonable expectation shown where POSA could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results).

2. Claim 2

The process according to claim 1 wherein the die comprises two or more rows of filament-forming holes

Schwarz '223 discloses a die body with multiple rows of nozzles (filament-forming holes). Ex. 1002, column 2, lines 29-35, 52-54; figure 2; Claim 1 (column 5, lines 39-45) (“multiplicity of nozzles arranged in at least two rows”).

3. Claim 3

The process according to claim 2 wherein at least one row of filament-forming holes comprises two or more filament-forming holes

Schwarz '223 discloses a die body with multiple rows of nozzles (filament-

forming holes). Ex. 1002, column 2, lines 29-35, 52-54; figure 2; Claim 1 (column 5, lines 39-45) (“multiplicity of nozzles arranged in at least two rows”).

4. Claim 5

The process according to claim 1 wherein one fluid-releasing hole is concentrically positioned around one filament-forming hole

Schwarz '223 discloses multiple rows of nozzles (filament-forming holes) sticking through the round holes (which are concentrically positioned around fluid-releasing holes) Ex. 1002, column 2, lines 51-54; figure 2.

5. Claim 6

The process according to claim 1 wherein the first polymer comprises a synthetic polymer

Schwarz '223 explicitly discloses using polypropylene. Ex. 1002, column 2, line 65. Polypropylene must be synthetic by definition because Claim 8 of the '801 Patent claims a synthetic polymer comprised of a polyolefin (Ex. 1001, Claim 8) and Claim 9 of the '801 Patent claims a synthetic polymer that is a polyolefin comprised of polypropylene. Ex. 1001, Claim 9; *see also* Ex. 1015, Bhat Declaration, ¶ 118.

6. Claim 7

The process according to claim 6 wherein the synthetic polymer is selected from the group consisting of: polyvinyl alcohol, polyvinyl alcohol derivatives, polyesters, nylons, polyolefins, polylactic acids, polyhydroxyalkanoates, polycaprolactones and mixtures thereof

Schwarz '223 explicitly discloses using polypropylene. Ex. 1002, column

2, line 65. Polypropylene must be a synthetic polymer selected from the group that includes polyolefins by definition because Claim 8 of the '801 Patent claims a synthetic polymer comprised of a polyolefin (Ex. 1001, Claim 8) and Claim 9 of the '801 Patent claims a synthetic polymer that is a polyolefin comprised of polypropylene. Ex. 1001, Claim 9; *see also* Ex. 1015, Bhat Declaration, ¶ 118.

7. Claim 8

The process according to claim 7 wherein the synthetic polymer comprises a polyolefin

Schwarz '223 explicitly discloses using polypropylene. Ex. 1002, column 2, line 65. Polypropylene must be a synthetic polymer that comprises a polyolefin by definition because Claim 9 of the '801 Patent claims a synthetic polymer that is a polyolefin comprised of polypropylene. Ex. 1001, Claim 9; *see also* Ex. 1015, Bhat Declaration, ¶ 118.

8. Claim 9

The process according to claim 8 wherein the polyolefin comprises polypropylene

Schwarz '223 explicitly discloses using polypropylene. Ex. 1002, column 2, line 65.

9. Claim 12

The process according to claim 1 wherein the first polymer comprises a compostable polymer

The term “compostable polymer” as used in Claim 12 of the '801 Patent

must include polylactic acids, polyhydroxyalkanoates, polycaprolactones and mixtures thereof because Claim 13 claims a compostable polymer selected from the group including polylactic acids, polyhydroxyalkanoates, polycaprolactones and mixtures thereof because. Ex. 1001, Claim 13. Keck discloses that thermoplastic meltblown filaments comprise a polymer selected from the group consisting of polyolefins, polyesters, polyamides, polycarbonates, polyurethanes, polyvinylchloride, polytetrafluoroethylene, polystyrene, polyethylene terephthalate, polylactic acid and copolymers and blends thereof. Ex. 1004, Claim 8. Since Keck discloses filaments (first polymer) made from polylactic acid, and the '801 Patent teaches that polymers made from polylactic acids are compostable, Keck explicitly discloses a first polymer comprising a compostable polymer as claimed in Claim 12 of the '801 Patent.

10. Claim 13

<i>The process according to claim 12 wherein the compostable polymer is selected from the group consisting of: polylactic acids, polyhydroxyalkanoates, polycaprolactones and mixtures thereof</i>
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Keck discloses that thermoplastic meltblown filaments comprise a polymer selected from the group consisting of polyolefins, polyesters, polyamides, polycarbonates, polyurethanes, polyvinylchloride, polytetrafluoroethylene, polystyrene, polyethylene terephthalate, polylactic acid and copolymers and blends thereof. Ex. 1004, Claim 8.

11. Claim 14

The process according to claim 1 wherein the solid additives comprise fibers

Keck discloses that the secondary material (solid additives) includes fibrous organic materials (fibers) and superabsorbent particles and fibers. Ex. 1004, ¶ 0003.

12. Claim 15

The process according to claim 14 wherein the fibers comprise wood pulp fibers

Keck discloses that the secondary material (solid additives) includes fibrous organic materials such as woody and non-wood pulp. Ex. 1004, ¶ 0003.

13. Claim 16

The process according to claim 1 wherein the solid additives are combined with the plurality of filaments by a solid additive spreader

Keck discloses that the secondary fibers (solid additives) are conveyed toward the stream of thermoplastic polymer fibers through a nozzle, with a housing that encloses the picker roll and provides a passageway or gap between the housing and the picker roll and that a gas (i.e. air) is supplied to the passage way or gap between the surface of the picker roll and the housing by way of a gas duct. Ex. 1004, ¶ 0088. The gas is supplied by any conventional arrangement including a blower and is supplied in sufficient quantity to serve as a medium for conveying the secondary fibers through the nozzle. *Id.* Keck further discloses that it is contemplated that additives and/or other materials may be added to or entrained in the gas stream to treat secondary fibers. *Id.* Keck further discloses a “conventional

particulate injection system” (solid additive spreader). Ex. 1004, ¶¶ 0092, 0108; *see also* Ex. 1015, Bhat Declaration, ¶¶ 96, 193.

14. Claim 17

The process according to claim 1 wherein the process further comprises the step of: [17g] contacting a surface of the fibrous structure with a plurality of filaments comprising a second polymer

Keck discloses preparing a two layer coform structure in which a second coform layer is formed directly on the first coform layer. Ex. 1004, ¶ 0150. This would necessarily result in the filaments of the second coform layer contacting a surface of the first coform layer (fibrous structure). Ex. 1015, Bhat Declaration, ¶¶ 105, 195. Keck further describes that the meltblown filaments of both coform layers comprise the same polypropylene resin. *Id.*, ¶ 106 The definition of “second polymer” must include the second polymer being the same as the first polymer because Claim 19 of the ’801 Patent, which depends on Claim 17, recites that the first and second polymer are the same. *Id.*; Ex. 1001, Claim 19.

15. Claim 18

The process according to claim 17 wherein the plurality of filaments comprising the second polymer are in the form of a fibrous structure

Keck discloses that the second layer is a coform nonwoven (fibrous structure) comprised a mixture of thermoplastic filaments and wood pulp fibers (solid additive). Ex. 1004, ¶ 0150.

16. Claim 19

The process according to claim 17 wherein the second polymer is the same as the first polymer

In example 5 of Keck, the filaments of the first coform layer and the filaments of the second coform layer both comprise the same grade polypropylene resin. Ex. 1004, ¶0150.

17. Claim 20

The process according to claim 1 wherein the fluid released by the fluid-releasing holes comprises air

Keck discloses “fibers formed by extruding a molten thermoplastic material through a plurality of fine, usually circular, die capillaries as molten threads or filaments into converging high velocity, usually hot, gas (e.g. air) streams which attenuate the filaments of molten thermoplastic material to reduce their diameter, which may be to microfiber diameter.” Ex. 1004, ¶ 0035.

18. Claim 21

The process according to claim 1 wherein the fibrous structure exhibits a pore volume distribution such that greater than about 40% of the total pore volume present in the fibrous structure exists in pores of radii of from about 121 um to about 200 um

The '801 Patent discloses that the spinnerette used in the examples of preparing the claimed fibrous structure was obtained from Biax-Fiberfilm

Corporation (“Biax”). Ex. 1001, column 15, lines 60-63. Notably, Schwarz ’223 is assigned to Biax-Fiberfilm Corporation. Ex. 1002, page 1.

Thus, it appears that the examples in the ’801 Patent were prepared with the same or similar meltblown die described in Schwarz ’223. Ex. 1015, Bhat Declaration, ¶ 204. Given the similarities between the Biax meltblown die described in the ’801 Patent and that of Schwarz ’223, it is reasonable to expect that a coform nonwoven prepared based on the combination of Schwarz ’223 and McDowall would have the same properties. *Id.* That is, it would be expected that a process of preparing a coform nonwoven using the meltblown die of Schwarz ’223 in combination with the coform process of Keck would produce a coform nonwoven having a pore volume distribution such that greater than about 40% of the total pore volume present in the fibrous structure exists in pores of radii of from about 121 um to about 200 um. Ex. 1015, Bhat Declaration, ¶¶ 204-205. *Id.*

Moreover, it is well known that pore size, and hence pore size distribution, in meltblown webs varies depending on process conditions, such as processing temperatures, increasing air flow rate at the die, and decreasing the distance between the filament nozzles and the collection surface, and the speed of the collection surface. *See, Bresee et al., Influence of Processing Conditions on Melt Blown Web Structure: Part 1 – DCD*, INJ Spring 2004, 49-55 (Ex. 1025); Bresee et al., *Influence of Processing Conditions on Melt Blown Web Structure: Part 2 –*

Primary Airflow Rate, INJ Summer 2005, 11-18 (Ex. 1026); and Lee et al. *Effects of Melt-Blowing Process Conditions on Morphological and Mechanical Properties of Polypropylene Webs*, POLYMER 1992, Vol. 3, No. 6, 1200-1209 (Ex. 1027). Ex. 1015, Bhat Declaration, ¶ 205. For example, changing one or more of the process parameters by increasing the air flow rate, decreasing the distance between the collection surface and filament nozzles, or increasing the speed of the collection surface is well known to decrease pore size in the meltblown web. *Id.* Similarly, decreasing air flow rate, increasing the distance between the collection surface and filament nozzles, or decreasing the speed of the collection surface is well known to increase pore size in the meltblown web. *Id.* As such, it is reasonable to expect that obtaining a coform nonwoven having the recited pore distribution is well within the routine skill of a POSA, and that doing such is merely an optimization of known parameters that affect pore size distribution. *Id.*

19. Claim 22

<i>The process according to claim 1 wherein the process further comprises the step of subjecting the fibrous structure to a thermal bonding operation</i>

Keck discloses “pattern bonded” which is a process of bonding a nonwoven web in a pattern by the application of heat and pressure or other methods, such as ultrasonic bonding. Keck discloses that thermal pattern bonding typically is carried out at a temperature in a range of from about 80 C. to about 180° C. Ex. 1004, ¶ 0047.

20. Claim 23

The process according to claim 1 wherein the process is directly coupled to a post-processing operation

Keck discloses “pattern bonded” which is a process of bonding a nonwoven web in a pattern by the application of heat and pressure or other methods, such as ultrasonic bonding. Keck discloses that thermal pattern bonding typically is carried out at a temperature in a range of from about 80 C. to about 180° C. Ex. 1004, ¶ 0047. The ’801 Patent expressly discloses that post-processing operations as that term is used in the ’801 Patent includes thermal bonding operations. Ex. 1001, column 9, line 31-38. Keck also describes additional steps (post-processing operations) of depositing the second composite stream onto the deposited layer as a matrix of meltblown filaments and a secondary material to form a two layer tufted coform nonwoven web. Ex. 1004, ¶ 0015-0018. The ’801 Patent expressly discloses that post-processing operations as that term is used in the ’801 Patent includes tuft-generating operations. Ex. 1001, column 9, lines 31-38.

Thermal bonding, such as the “pattern bonded” process described in Keck and the tufting-generating operations are performed during the manufacturing process of the nonwoven web, and are therefore considered as being “directly coupled to a post-processing operation.” Ex. 1015, Bhat Declaration, ¶ 210.

21. Claim 24

The process according to claim 1 wherein the process is closely coupled to a

<i>post-processing operation</i>

Keck describes preparation of cleaning sheets using the nonwoven web. Such cleaning sheets may include treatment with a liquid or other materials Ex. 1004, ¶¶ 0137-0140. The conversion of Keck's nonwoven web into such treated cleaning sheets typically occurs at a separate facility from that of manufacture of the nonwoven web and is therefore considered a "closely coupled" post processing operation. Ex. 1015, Bhat Declaration, ¶ 213.

C. Ground 2: Claims 1-3, 5-9, 12-25 are Obvious over Schwarz '616 in View of Keck

1. Independent Claims 1 and 25

Schwarz '616 teaches an apparatus and process for meltblowing fiberforming thermoplastic polymers to form fine fibers by extruding through spinning nozzles arranged in four or more rows. Ex. 1005, abstract. The molten fibers are accelerated to high velocity by gas being blown in parallel flow through small circular gas orifices surrounding each nozzle. *Id.* The air orifices are formed by a family of plates which affect the perfect centering of each nozzle in each of the circular air orifices. *Id.*

Schwarz '616 explicitly discloses all but one element of independent claims 1 and 25 of the '801 Patent. The remaining element – combining the filaments with solid additives (wood pulp) to form a mixture – would have been obvious to a POSA based on Schwarz's disclosures in light of the teachings of Keck.

Preamble: A process for making a fibrous structure, the process comprising the steps of:

The preamble does not affect patentability. *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002). To the extent deemed a limitation, however, Schwarz '616 teaches a process for making a fibrous structure. Ex. 1005, abstract, Claim 5.

Element a (Claims 1 and 25): providing a die comprising one or more filament-forming holes, wherein one or more fluid-releasing holes are associated with one filament-forming hole such that a fluid exiting the fluid-releasing hole contacts an exterior surface of a filament exiting the filament-forming hole at an angle of less than 10°

Schwarz '616 discloses this element, providing a die body 1 (die) comprising spinning nozzles 3 (filament-forming holes), wherein gas cavity 5 (fluid-releasing holes) are associated with spinning nozzles 3 (filament-forming holes) such that a fluid exiting the gas cavity 5 (fluid-releasing holes) is parallel or substantially parallel to an exterior surface of a filament exiting the spinning nozzles 3 (filament-forming holes). Ex. 1005, column 2, lines 15-52, Claim 5, figure 1, figure 2A, figure 2B.

Element b (Claim 1): supplying at least a first polymer to the die

Element b (Claim 25): supplying a polyolefin polymer to the die

Schwarz '616 discloses supplying polypropylene (first polymer) to the die body 1 (die). Ex. 1005, column 2, lines 63-66. Polypropylene is a particular type of polyolefin. This must be true because dependent Claim 9 of the '801 Patent

claims a polyolefin that comprises polypropylene. *See also* Ex. 1015, Bhat Declaration ¶220.

Element c (Claims 1 and 25): producing a plurality of filaments comprising the first polymer from the die

Schwarz '616 discloses producing a plurality of filaments comprising the polypropylene (first polymer) from the die body 1 (die). Ex. 1005, Claim 5, figure 1, figure 2A, figure 2B.

Element d (Claims 1 and 25): supplying a fluid to the die such that the fluid exits the one or more fluid-releasing holes parallel or substantially parallel to the exterior surface of at least one of the filaments

Schwarz '616 discloses supplying air (a fluid) to the die body 1 (die) such that the air (fluid) exits the gas cavity 5 (fluid-releasing holes) parallel or substantially parallel to the exterior surface of at least one of the filaments. Ex. 1005, column 2, lines 15-52, Claim 5, figure 1, figure 2A, figure 2B.

Element f (Claims 1 and 25): collecting the mixture on a collection device to produce a fibrous structure.

Schwarz '616 discloses collecting the mixture on a receiver (collection device) to produce a fibrous structure. Ex. 1005, Claim 5.

Element e (Claim 1): combining the filaments with solid additives to form a mixture

Element e (Claim 25): combining the filaments with wood pulp fibers to form a mixture

This is the only element of independent claims 1 and 25 that is not explicitly disclosed in Schwarz '616. But adding solid additives, or specifically wood pulp fibers, to polymer filaments to form a mixture has been long known in the art (referred to as coform), and is explicitly disclosed in Keck (and many other prior art references known at the time).

a. Motivation to Combine

Prior to the patent owner's earliest possible priority date (July 17, 2007), a POSA would have been motivated to modify Schwarz '616 in view of Keck in order to provide a coform nonwoven having lower manufacturing costs. Schwarz '616 and Keck are both analogous to the invention claimed in the '801 Patent because they concern the same field of endeavor. Ex. 1015, Bhat Declaration, ¶¶ 63, 88.

More specifically, a POSA would have known that the multirow meltblown die taught in Schwarz '616 provides significant improvements with respect to throughput, and hence, productivity. As a consequence, the costs associated with manufacturing the coform nonwoven per unit would be decreased, which would improve the manufacturer's competitiveness in the market and potentially provide a greater return on investment. *Id.*, ¶ 231.

Reasonable Expectation of Success

A POSA would have had a reasonable expectation of success in modifying Schwarz '616 in use in a coform process as described in Keck. The relatively

simple substitution of a multirow meltblown die of Schwarz '616 in lieu of a knife-edge meltblown die in the coform process is well within the routine skill of the POSA and such a substitution would not result in either the coform process of Keck or the meltblown process of Schwarz '616 being inoperable. *Id.*, ¶ 233.

2. Claim 2

The process according to claim 1 wherein the die comprises two or more rows of filament-forming holes

Schwarz '616 discloses a die comprised of multiple rows of spinning orifices or nozzles (filament-forming holes). Ex. 1005, column 1, lines 20-28; 49-51; figure 2A; Claim 1 (“a multiplicity of nozzles arranged in at least four rows”).

3. Claim 3

The process according to claim 2 wherein at least one row of filament-forming holes comprises two or more filament-forming holes

Schwarz '616 discloses a die comprised of multiple rows of spinning orifices or nozzles (filament-forming holes) with multiple nozzles (two or more filament-forming holes). Ex. 1005, column 1, lines 49-51; figure 2A.

4. Claim 5

The process according to claim 1 wherein one fluid-releasing hole is concentrically positioned around one filament-forming hole

Schwarz '616 discloses a nozzle (filament-forming hole) centered inside (concentrically positioned) a hole (fluid-releasing hole) Ex. 1005, column 2, lines 44-46; figures 1, 2A.

5. Claim 6

The process according to claim 1 wherein the first polymer comprises a synthetic polymer

Keck discloses that thermoplastic meltblown filaments comprise a polymer selected from the group including polyolefins, polyesters, and polylactic acids, which are synthetic polymers. Ex. 1004, Claim 8; Ex. 1015, Bhat Declaration, ¶ 56. Polyolefins, polyesters, and polylactic acids must be synthetic by definition because Claim 7 of the '801 Patent claims a synthetic polymer selected from the group including polyolefins, polyesters, and polylactic acids. Ex. 1001, Claim 7. Since Keck discloses polymers made from polyolefins and polyesters, Keck discloses a first polymer comprising a synthetic polymer.

6. Claim 7

The process according to claim 6 wherein the synthetic polymer is selected from the group consisting of: polyvinyl alcohol, polyvinyl alcohol derivatives, polyesters, nylons, polyolefins, polylactic acids, polyhydroxyalkanoates, polycaprolactones and mixtures thereof

Keck discloses that thermoplastic meltblown filaments comprise a polymer selected from the group including polyolefins and polyesters. Ex. 1004, Claim 8. Keck also explicitly discloses thermoplastic polymers including polyesters. Ex. 1004, ¶ 0052.

7. Claim 8

The process according to claim 7 wherein the synthetic polymer comprises a polyolefin

Keck explicitly discloses thermoplastic polymers including polyolefins.

Ex. 1004, ¶ 0052.

8. Claim 9

The process according to claim 8 wherein the polyolefin comprises polypropylene

Keck explicitly discloses thermoplastic polymers including polypropylene.

Ex. 1004, ¶ 0052.

9. Claims 12-20

See discussion above in Ground 1 (incorporated herein by this reference) for the teachings of Keck with regard to Claims 12-20.

10. Claim 21

The process according to claim 1 wherein the fibrous structure exhibits a pore volume distribution such that greater than about 40% of the total pore volume present in the fibrous structure exists in pores of radii of from about 121 um to about 200 um

The '801 Patent discloses that the spinnerette used in the examples of preparing the claimed fibrous structure was obtained from Biax-Fiberfilm Corporation ("Biax"). Ex. 1001, column 15, lines 60-63. Notably, the Schwarz '616 was assigned to Biax-Fiberfilm Corporation between July 23, 2001 and January 28, 2010. Ex. 1020, at 1.

Thus, it appears that the examples in the '801 Patent were prepared with the same or similar meltblown die described in Schwarz '616. Ex. 1015, Bhat

Declaration, ¶ 271. Given the similarities between the Biax meltblown die described in the '801 Patent and that of Schwarz '616, it is reasonable to expect that a coform nonwoven prepared based on the combination of Schwarz '616 and Keck would have the same pore volume distribution properties as recited in Claim 21. *Id.* That is, it would be expected that a process of preparing a coform nonwoven using the meltblown die of Schwarz '616 as modified with the solid additive process of Keck would produce a coform nonwoven having a pore volume distribution such that greater than about 40% of the total pore volume present in the fibrous structure exists in pores of radii of from about 121 μm to about 200 μm . *Id.*

Preparing a meltblown web having a pore volume distribution such that greater than about 40% of the total pore volume present in the fibrous structure exists in pores of radii of from about 121 μm to about 200 μm as recited in Claim 21 is within the routine skill of a POSA. Ex. 1015, Bhat Declaration, ¶ 272; *see also* discussion of Claim 21 in Ground 1 (incorporated herein by this reference).

11. Claims 22-24

See discussion above in Ground 1 (incorporated herein by this reference) for the teachings of Keck with regard to Claims 22-24.

D. Ground 3: Claims 1-3, 5-9, 14-15, 20-25 are Obvious over Schwarz '223 in View of McDowall

1. Independent Claims 1 and 25

As discussed above, Schwarz '223 explicitly discloses all but one element of independent claims 1 and 25 of the '801 Patent. The remaining element – combining the filaments with solid additives (wood pulp) to form a mixture – would have been obvious to a POSA based on Schwarz's disclosures in light of the teachings of McDowall.

Element e (Claim 1): combining the filaments with solid additives to form a mixture

Element e (Claim 25): combining the filaments with wood pulp fibers to form a mixture

This is the only element of independent claims 1 and 25 that is not explicitly disclosed in Schwarz '223. But adding solid additives, or specifically wood pulp fibers, to polymer filaments to form a mixture has been long known in the art (referred to as coform), and is explicitly disclosed in McDowall (and many other prior art references known at the time). Ex. 1003, Claim 1; page 4.

a. Motivation to Combine

Prior to the patent owner's earliest possible priority date (July 17, 2007), a POSA would have been motivated to modify Schwarz '223 in view of McDowall in order to provide a coform nonwoven having lower manufacturing costs and

exhibiting improved strength. Schwarz '223 and McDowall are both analogous to the invention claimed in the '801 Patent because they concern the same field of endeavor. Ex. 1015, Bhat Declaration, ¶¶ 81, 109.

More specifically, a POSA would have known that the multirow meltblown die taught in Schwarz '223 provides significant improvements with respect to throughput, and hence, productivity. As a consequence, the costs associated with manufacturing the coform nonwoven per unit would be decreased, which would improve the manufacturer competitiveness in the market and potentially provide a greater return on investment. In addition, a POSA would be motivated to modify Schwarz '223 in view of McDowall in order to improve the strength of the coform nonwoven. Schwarz '223 explicitly states that the fibers prepared therein have improved tenacity. As such, a POSA would have been motivated to modify Schwarz '223 in view of McDowall to provide a coform nonwoven having improved strength.

Further, McDowall teaches that both meltblown continuous filaments and spunbond continuous filaments may be used interchangeably to prepare McDowall's absorbent nonwoven. Ex. 1015, Bhat Declaration, ¶ 86. In addition, it is clear that McDowall is not limited to only using spunbond or meltblown filaments, but rather embraces other methods of preparing filaments by extrusion from a spinnerette. *Id.*

b. Reasonable Expectation of Success

A POSA would have had a reasonable expectation of success in modifying Schwarz '223 in use in a coform process as described in McDowall. The relatively simple substitution of a multirow meltblown die of Schwarz '223 in lieu of a knife-edge meltblown die in the coform process is well within the routine skill of the POSA and such a substitution would not result in either the coform process of McDowall or the meltblown process of Schwarz '223 being inoperable.

2. Claims 2-9

See discussion above in Ground 1 (incorporated herein by this reference) for the teachings of Schwarz '223 with regard to Claims 2-9.

3. Claim 7

The process according to claim 6 wherein the synthetic polymer is selected from the group consisting of: polyvinyl alcohol, polyvinyl alcohol derivatives, polyesters, nylons, polyolefins, polylactic acids, polyhydroxyalkanoates, polycaprolactones and mixtures thereof

In addition to the teachings of Schwarz '223, McDowall also explicitly discloses synthetic polymers including polyesters and other high tensile materials. Ex. 1003, p. 8.

4. Claim 8

The process according to claim 7 wherein the synthetic polymer comprises a polyolefin

In addition to the teachings of Schwarz '223, McDowall also explicitly

discloses synthetic polymers including polypropylene (Ex. 1003, p. 8), which is a polyolefin by definition because Claim 9 of the '801 Patent claims a synthetic polymer that is a polyolefin comprised of polypropylene. Ex. 1001, Claim 9.

5. Claim 9

The process according to claim 8 wherein the polyolefin comprises polypropylene

In addition to the teachings of Schwarz '223, McDowall also explicitly discloses synthetic polymers including polypropylene (Ex. 1003, p. 8).

6. Claim 14

The process according to claim 1 wherein the solid additives comprise fibers

McDowall discloses that pulp fibers (solid additives) refers to fibers from natural sources such as woody and non-woody plants. Ex. 1003, p. 4.

7. Claim 15

The process according to claim 14 wherein the fibers comprise wood pulp fibers

McDowall discloses that pulp fibers (solid additives) refers to fibers from natural sources such as woody and non-woody plants. Ex. 1003, p. 4.

8. Claims 20-21

See discussion above in Ground 1 (incorporated herein by this reference) for the teachings of Schwarz '223 with regard to Claims 20-21.

9. Claim 22

The process according to claim 1 wherein the process further comprises the

step of subjecting the fibrous structure to a thermal bonding operation

McDowall discloses “thermal point bonding” and teaches that it means passing a fabric or web of fibers to be bonded between a heated calender roll and an anvil roll in order to hold the laminate layers together and impart integrity to each individual layer by bonding filaments and/or fibers within each layer. Ex. 1003, pp. 6-7.

10. Claim 23

The process according to claim 1 wherein the process is directly coupled to a post-processing operation

McDowall discloses “thermal point bonding” and “through-air bonding” (Ex. 1003 at 6-7, 16) after the web formation, which is considered a directly coupled post -processing operation. Ex. 1015, Bhat Declaration, ¶ 84.

11. Claim 24

The process according to claim 1 wherein the process is closely coupled to a post-processing operation

McDowall discloses absorbent nonwoven composites can be used in various medical products, which contain alcohol or other disinfectants. (Ex. 1003, at 10), which is considered a closely coupled post-processing operation. Ex. 1015, Bhat Declaration, ¶ 89.

E. Ground 4: Claims 10-11 are invalid as Obvious over Schwarz '223 in View of Keck (or McDowall) in further view of Bond

As outlined above, Schwarz '223 discloses each element of Claim 1 except the

step of combining the filaments with solid additives to form a mixture, which is disclosed by both Keck and McDowall.

Dependent Claim 10 of the '801 Patent, further claims where the polymer disclosed in Claim 1 is a natural polymer, and Claim 11 claims a specific type of natural polymer. U.S. Patent No. 6,783,854 to Bond explicitly discloses such natural polymers, and it would have been obvious to a POSA to combine the teachings of Schwarz '223 with Keck (or McDowall) and Bond.

Bond is directed to continuous bicomponent fibers that may be used in the preparation of meltblown and spunbond nonwoven fabrics. Bond teaches that the bicomponent filaments may be made with melt spinning processes, and may be used to produce continuous filaments through spunbond methods or meltblowing processes. Ex. 1006, column 12, line 61-column 13, line 4. Bond further teaches that the nonwovens prepared from the bicomponent fibers may be used in hygiene applications, which includes wipes and diapers. *Id.*, column 14, lines 30-45. Accordingly, Bond is in the same field of the endeavor or the '801 Patent. Ex. 1015, Bhat Declaration ¶ 122.

Prior to the patent owner's earliest possible priority date (July 17, 2007), a POSA would have been motivated to modify the process of Schwarz '223 as modified by Keck or McDowall to include a thermoplastic starch (natural polymer) as taught by Bond in order to provide a coform nonwoven that is environmentally

degradable and thus flushable. Ex. 1015, Bhat Declaration ¶ 325. Schwarz '223, Keck, McDowall, and Bond are all analogous to the invention claimed in the '801 Patent because they concern the same field of endeavor. Ex. 1015, Bhat Declaration, ¶¶ 81, 91, 109, 122. Combining Schwarz '223 with Keck or McDowall along with Bond would not make any of them inoperable. *Id.*

1. Claim 10

The process according to claim 1 wherein the first polymer comprises a natural polymer

Bond describes bicomponent fibers having a sheath/core configuration in which a non-starch thermoplastic polymer (defining the sheath) surrounds a thermoplastic starch (defining the core). Ex. 1006, abstract. Bond states that the thermoplastic starch is a naturally occurring biopolymer. *Id.*, column 4, lines 58-60.

2. Claim 11

The process according to claim 10 wherein the natural polymer is selected from the group consisting of: starch, starch derivatives, cellulose, cellulose derivatives, hemicellulose, hemicellulose derivatives, and mixtures thereof

Bond expressly identifies suitable starches:

Suitable naturally occurring starches can include, but are not limited to, corn starch (including, for example, waxy maize starch), potato starch, sweet potato starch, wheat starch, sago palm starch, tapioca starch, rice starch, soybean starch, arrow root starch, bracken starch, lotus starch, cassava starch, high amylose corn starch, and commercial amylose powder. Blends of starch may also be used.

Ex. 1006, column 5, line 51-57.

F. Ground 5 Claims 1-4, 6-9, 12-20, 22-25 are invalid as Obvious over Keck in View of Fabbicante

1. Independent Claims 1 and 25

Keck is directed to a coform nonwoven and processes of preparing the same.

Ex. 1004, abstract, Claims 1, 34. Keck describes a process of preparing a coform nonwoven (a “fibrous structure”) prepared from meltblown filaments and a secondary additive. *Id.*, abstract. Keck describes that the coform nonwoven may be used to form “a presaturated or absorbent cleaning sheet used as a wiper,...” *Id.*, ¶ 0135. More specifically, Keck states that “[c]oform nonwoven webs have been used in applications such as disposable absorbent articles, absorbent dry wipes, wet wipes, wet mops and absorbent dry mops.” *Id.*, ¶ 0006.

Keck explicitly discloses all but one element of independent Claims 1 and 25 of the ’801 Patent. The remaining element – supplying fluid (air) at an angle less than 10° (or substantially parallel) – was well known in the art and would have been obvious to a POSA based on Keck’s disclosures in light of the teachings of Fabbicante. An element-by-element analysis follows:

<i>Preamble: A process for making a fibrous structure, the process comprising the steps of:</i>

Keck teaches a process for making a fibrous structure. Ex. 1004, abstract, Claim 34.

Element a (Claims 1 and 25): providing a die comprising one or more filament-forming holes, wherein one or more fluid-releasing holes are associated with one filament-forming hole such that a fluid exiting the fluid-releasing hole contacts an exterior surface of a filament exiting the filament-forming hole at an angle of less than 10°

As shown in figure 3, Keck discloses a pair of extruders 14, 14' that feed molten polymer into a pair of corresponding meltblowing dies 16, 18, respectively, that contain “small holes or orifices 24 and 24'” (filament forming holes). Ex. 1004, ¶¶ 0084, 0085. Each meltblowing die produces a stream of gas (from one or more fluid releasing holes) that contacts and attenuates the filaments as they exit small holes or orifices of the meltblowing die to form a filament containing stream. *Id.*, ¶ 0085.

Keck does not explicitly disclose the angle of the fluid with respect to the surface of the filament, but Fabbriante teaches providing the fluid substantially parallel to the filament and it would be obvious to combine the teachings of Keck and Fabbriante. Fabbriante discloses that the air nozzles are capable of producing high velocities with the angle formed between the axis of the filament die holes and the air nozzles varied between 0° and 60°. Ex. 1018, column 3, lines 58-62. When the angle is 0°, the air flows parallel to the filaments as they are extruded from the die holes.

Element b (Claim 1): supplying at least a first polymer to the die

Element b (Claim 25): supplying a polyolefin polymer to the die

Keck discloses that thermoplastic meltblown filaments comprise a polymer selected from the group consisting of polyolefins, polyesters, polyamides, polycarbonates, polyurethanes, polyvinylchloride, polytetrafluoroethylene, polystyrene, polyethylene terephthalate, polylactic acid and copolymers and blends thereof. *Id.*, ¶ 0052, Claim 8. More specifically, Keck teaches that the meltblown filaments may comprise polyolefins, such as polypropylene. *Id.*, ¶ 0052. In addition to polyolefins, Keck teaches that the meltblown filaments may comprise biodegradable filaments, such as polylactic acids. *Id.*

Element c (Claims 1 and 25): producing a plurality of filaments comprising the first polymer from the die

Keck discloses that thermoplastic meltblown filaments comprise a polymer. *Id.*, ¶ 0052, Claim 8.

Element d (Claims 1 and 25): supplying a fluid to the die such that the fluid exits the one or more fluid-releasing holes parallel or substantially parallel to the exterior surface of at least one of the filaments

Keck does not explicitly disclose the angle of the fluid with respect to the surface of the filament, but Fabbriante teaches providing the fluid substantially parallel to the filament and it would be obvious to combine the teachings of Keck and Fabbriante. Fabbriante discloses that the air nozzles are capable of producing high velocities with the angle formed between the axis of the filament die holes and the air nozzles varied between 0° and 60°. Ex. 1018, column 3, lines 58-62. When

the angle is 0°, the air flows parallel to the filaments as they are extruded from the die holes.

Element e (Claim 1): combining the filaments with solid additives to form a mixture

Element e (Claim 25): combining the filaments with wood pulp fibers to form a mixture

Keck discloses that a secondary gas stream containing secondary fibers (solid additives), such as pulp fibers, is directed between the two filament streams at the impingement zone 30. *Id.*, ¶ 0093. The resulting composite stream 56 comprising the merged filament streams and gas stream containing secondary fibers is deposited on a collecting device, such as an endless forming surface 58. *Id.*, ¶ 0097.

Keck discloses that the secondary material (solid additives) includes fibrous organic materials (fibers) and superabsorbent particles and fibers. Ex. 1004, ¶ 0003. In particular, Keck teaches that the secondary material (i.e., secondary fibers) of the coform nonwoven may be an absorbent material, such as absorbent fibers. *Id.*, ¶ 0056. Examples of such secondary fibers include cellulosic derived fibers, such as wood pulp fibers. *Id.*

Element f (Claims 1 and 25): collecting the mixture on a collection device to produce a fibrous structure.

Keck discloses that the resulting composite stream 56 comprising the merged filament streams and gas stream containing secondary fibers is deposited on a collecting device, such as an endless forming surface 58. *Id.*, ¶ 0097.

a. Motivation to Combine

Prior to the patent owner's earliest possible priority date (July 17, 2007), a POSA would have been motivated to modify Keck in view of Fabbriante in order to provide a coform nonwoven exhibiting significantly improved strength. Keck and Fabbriante are both analogous to the invention claimed in the '801 Patent because they concern the same field of endeavor. Ex. 1015, Bhat Declaration, ¶¶ 91, 130.

More specifically, a POSA would have known that the modular multirow meltblown die taught in Fabbriante provides significant improvements with respect to strength in comparison to typical meltblown webs (prepared with a single row knife edge meltblown die). As noted in Fabbriante,

[t]he instant invention is based on the discovery that using the modular die design, in a melt blowing configuration at low pressure and low polymer flows per hole, continuous fibers of extremely uniform size distribution are created, which fibers and their resultant unbonded webs exhibit significant strength compared to typical unbonded melt blown or spunbond webs.

Ex. 1018, column 2, lines 41-48.

Accordingly, a POSA would have been motivated to modify Keck in view of Fabbriante to provide a process of preparing a fibrous structure (e.g., coform) that exhibits significant improvements in strength. As discussed previously, Fabbriante teaches that the modular meltblown die described therein produces a meltblown web having “higher unbonded strength than a typical meltblown web.”

Ex., 1018, column 4, lines 7-8. In view of the known desire to improve the strength of meltblown webs, a POSA would have been motivated to use the multirow meltblown die of Fabbriante in the coform process of Keck in order to provide a higher strength coform nonwoven.

In addition, the POSA would be motivated to combine Keck with Fabbriante to provide higher polymer throughputs without the significant capital expense typically associated with machining a traditional meltblown die. Finally, Fabbriante contemplates that the meltblown web may be used in combination with cellulose fibers, and also contemplates use of the meltblown web in a wiper application. In view of this suggestion, a POSA would be motivated to use Fabbriante's multirow meltblown die in a process to prepare a coform nonwoven, such as the coform process disclosed in Keck.

b. Reasonable Expectation of Success

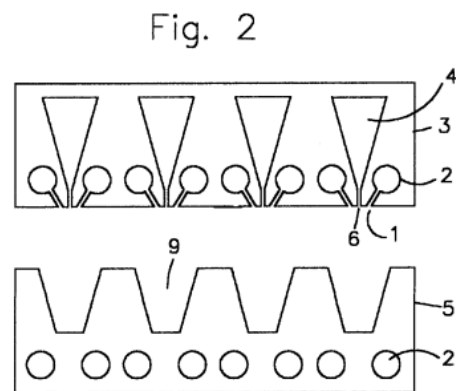
A POSA would have had a reasonable expectation of success in modifying the coform process in Keck with the multirow meltblown die of Fabbriante. The relatively simple substitution of a multirow meltblown die of Fabbriante in lieu of a knife-edge meltblown die in the coform process is well within the routine skill of the POSA and such a substitution would not result in either the coform process of Keck or the meltblown process of Fabbriante being inoperable. Ex. 1015, Bhat Declaration, ¶ 357.

In addition, Fabbicante contemplates the use of cellulose fibers in combination with a meltblown web prepared with Fabbicante's multirow meltblown die. *Id.*, ¶ 355. Accordingly, modifying Keck to include the multirow meltblown die of Fabbicante is well within the routine skill of a POSA, and therefore, a POSA would have a reasonable expectation of success in making the modification. *Id.*, ¶ 357.

2. Claim 2

The process according to claim 1 wherein the die comprises two or more rows of filament-forming holes

Fabbicante discloses in figure 2 a primary plate 3 and secondary plate 5 when assembled provides a modular multirow meltblown die having at least four rows of polymer orifices 6. Ex. 1018, figure 2, column 5, lines 49-51.



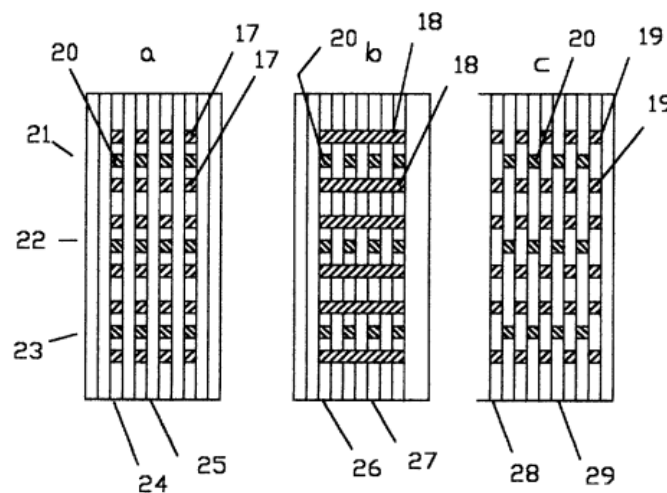
Id., figure 2.

3. Claim 3

The process according to claim 2 wherein at least one row of filament-forming holes comprises two or more filament-forming holes

Fabbicante discloses in figure 3, below, a plan view that depicts three different assembled die bodies comprising a plurality of primary plates and secondary plates in an assembled state.

Fig. 3



Id., figure 3. In the assembled die body a, the assembled die includes 3 rows of polymer orifices 20 in which each row includes at least 4 polymer orifices, and in which each individual polymer orifice is flanked on opposing sides by a pair of the air nozzles 17. *Id.*, figure 3, column 5, lines 53-65.

4. Claim 4

The process according to claim 1 wherein more than one fluid-releasing hole are associated with a filament-forming hole

Fabbricante discloses in figure 3, the assembled die includes 3 rows of polymer orifices 20 in which each row includes at least 4 polymer orifices, and in which each individual polymer orifice is flanked on opposing sides by a pair of the air nozzles 17. *Id.*, figure 3, column 5, lines 53-65.

5. Claim 6

The process according to claim 1 wherein the first polymer comprises a synthetic polymer

Keck discloses that thermoplastic meltblown filaments comprise a polymer selected from the group including polyolefins and polyesters. *Id.*, ¶ 0052, Claim 8. More specifically, Keck teaches that the meltblown filaments may comprise polyolefins, such as polypropylene. *Id.*, ¶ 0052. Polypropylene must be a synthetic polymer. Polypropylene must be synthetic by definition because Claim 8 of the '801 Patent claims a synthetic polymer comprised of a polyolefin (Ex. 1001, Claim 8) and Claim 9 of the '801 Patent claims a synthetic polymer that is a polyolefin comprised of polypropylene. Ex. 1001, Claim 9; Ex. 1015, Bhat Declaration, ¶ 56.

6. Claim 7

The process according to claim 6 wherein the synthetic polymer is selected from the group consisting of: polyvinyl alcohol, polyvinyl alcohol derivatives, polyesters, nylons, polyolefins, polylactic acids, polyhydroxyalkanoates, polycaprolactones and mixtures thereof

Keck discloses that thermoplastic meltblown filaments comprise a polymer selected from the group including polyolefins and polyesters. *Id.*, ¶ 0052, Claim 8.

7. Claim 8

The process according to claim 7 wherein the synthetic polymer comprises a polyolefin

Keck discloses that thermoplastic meltblown filaments comprise a polymer selected from the group including polyolefins and polyesters. *Id.*, ¶ 0052, Claim 8.

8. Claim 9

The process according to claim 8 wherein the polyolefin comprises polypropylene

Keck teaches that the meltblown filaments may comprise polyolefins, such as polypropylene. *Id.*, ¶ 0052.

9. Claims 12-20, 22-24

See discussion above in Ground 1 (incorporated herein by this reference) for the teachings of Keck with regard to Claims 12-20, 22-24.

G. Ground 6: Claim 21 is obvious under 35 U.S.C. §103 based on the teachings of Schwarz '223 (Ex. 1002) in view of Keck (Ex. 1004) or McDowall (Ex. 1003), and in further view of United States Patent Application Publication No. 2007/0202766 to Ouellette et al. (“Ouellette”) (Ex. 1028)

1. Claim 21

The process according to claim 1 wherein the fibrous structure exhibits a pore volume distribution such that greater than about 40% of the total pore volume present in the fibrous structure exists in pores of radii of from about 121 um to about 200 um

It is well known that pore size, and hence pore size distribution, in meltblown webs varies depending on process conditions, such as processing temperatures, increasing air flow rate at the die, and decreasing the distance between the filament nozzles and the collection surface, and the speed of the collection surface. Ex. 1015, Bhat Declaration, ¶ 404. Accordingly, providing a coform nonwoven having the recited pore size distribution is well within the routine skill of a POSA. *Id.*

Ouellette explicitly discloses a nonwoven material for use as a wipe having a pore size distribution that overlaps with that recited in Claim 21 of the '801 Patent. Ex. 1029, abstract. More specifically, Ouellette teaches a nonwoven material having an optimized pore volume distribution in which at least 50 percent of its cumulative volume within pores as a radius size of about 110 to 250 microns. *Id.* Ouellette further teaches that the nonwoven material may be a meltblown or coform, and may include polypropylene and wood pulp fibers. *Id.*, ¶¶ 0019, 0058.

Ouellette explains that the “optimized pore volume distribution of the substrate enables it to controllably release a fluid composition effectively onto a surface.” *Id.*, Abstract. Accordingly, the combination of Schwarz '223 with Keck or McDowall, and in further view of Ouellette teaches each and every element of Claim 21.

In addition, it is also clear that the combinations of 1) Schwarz '616 with either Keck or McDowall and in further view of Ouellette, and 2) Keck and

Fabbricante in further view of Ouellette teaches each and every element of Claim 21. As such, Claim 21 is also obvious in view of these additional grounds of invalidity.

A POSA would be motivated to modify any one of Schwarz '223, Schwarz '616, and Fabbricante in view of Keck or McDowall and in further view of Ouellette to have the recited pore volume distribution in order to provide a wipe that controllably releases a fluid composition onto a surface. Ex. 1015, Bhat Declaration, ¶ 409. That is, a POSA would be motivated to modify the combination of references in order to provide a more effective wipe. *Id.*

I. Secondary Considerations of Non-Obviousness

The '801 Patent does not claim any unexpected results or other secondary considerations, because the results of combining a known process of preparing meltblown filaments using a multirow die with the well known coform process of adding wood pulp fibers to continuous meltblown or spunbond filaments was well known in the prior art prior to the earliest priority date of the '801 Patent.

II. Conclusion

The claims of the '801 Patent recite elements that are well-known in the prior art. An IPR should be instituted with respect to claims 1-25 of the '801 Patent and all 25 claims should be found invalid.

Respectfully submitted,

/Patrick D. Kuehl, Jr./

Patrick D. Kuehl, Jr., Reg. No. 59,440

Rimon PC
633 E. 63rd Street, Ste 220
Kansas City, MO 64110
(816) 839-7471
Email: patrick.kuehl@rimonlaw.com

CERTIFICATE OF WORD COUNT

In accordance with 37 C.F.R. § 42.24, excluding table of contents, a table of authorities, mandatory notices under §42.8, a certificate of service or word count, appendix of exhibits, or listing of claims, the undersigned certifies that the number of words contained in this Petition is 13,073.

/Patrick D. Kuehl, Jr./
Patrick D. Kuehl, Jr., Reg. No. 59,440

Rimon PC
633 E. 63rd Street, Ste 220
Kansas City, MO 64110
(816) 839-7471
Email: patrick.kuehl@rimonlaw.com

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of this Petitioner's Petition for *Inter Partes* Review has been served on September 22, 2023 in its entirety by UPS on the Patent Owner and following counsel of record for Patent Owner:

Correspondence address

27752 - THE PROCTER & GAMBLE COMPANY
GLOBAL IP SERVICES
CENTRAL BUILDING, C9
ONE PROCTER AND GAMBLE PLAZA
CINCINNATI, OH 45202
UNITED STATES

/Patrick D. Kuehl, Jr./
Patrick D. Kuehl, Jr., Reg. No. 59,440

Rimon PC
633 E. 63rd Street, Ste 220
Kansas City, MO 64110
(816) 839-7471
Email: patrick.kuehl@rimonlaw.com