

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CASPER SLEEP INC.,
Petitioner,

v.

WERNER MEDIA PARTNERS, LLC,
Patent Owner.

IPR2024-00474 Patent
10,842,301 B2

Before BARRY L. GROSSMAN, JASON W. MELVIN, and
RYAN H. FLAX, *Administrative Patent Judges*.

FLAX, *Administrative Patent Judge*.

PATENT OWNER RESPONSE

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TABLE OF EXHIBITS

Exhibit No.	Description
2001	Declaration of Andrew Gross (“Gross Decl.”)
2002	Curriculum Vitae of Andrew Gross
2003	PDF of Patent Owner’s GhostPillow Product Website
2004	Viscoelastic (Memory) Foam, by the Polyurethane Foam Association
2005	Flexible Polyurethane Foam: A Primer, by the PFA
2006	“Reticulate”, <i>Merriam-Webster.com Dictionary</i> , Merriam-Webster
2007	“Infuse”, <i>Merriam-Webster.com Dictionary</i> , Merriam-Webster
2008	Leggett & Platt To Market Serta-Branded Sleep Comfort Systems Products (April 5, 2005), by Furniture World Magazine
2009*	Foam Equipment, by Wayne Bowman (Video Presentation to Polyurethane Foam Association), https://www.youtube.com/watch?v=5XThFsqqUvU&t=4s
2010	“Solid”, <i>Merriam-Webster.com Dictionary</i> , Merriam-Webster
2011	GhostPillow Memory Foam, https://www.ghostbed.com/products/ghostpillow-memory-foam (“GhostPillow”)
2012	U.S. Reexamination Request Control No. 90/009,855 (“ <i>Ex Parte</i> Whirlpool”)
2013	Declaration of Jeff Quinn (“Quinn Decl.”)
2014	Curriculum Vitae of Jeff Quinn
2015	Jeff Quinn Presentation of Secondary Considerations

2016	Market Survey Summary of Results Data
2017	Element Materials Technology, Test Results (“Element Test”)

* The YouTube video was not available for download outside of the YouTube portal. The presenter of the video did not respond to a request for a copy of the video for submission.

** Patent Owner has performed an OCR operation on all Exhibits and this Response.

I. INTRODUCTION

Respectfully, Petitioner's assertion that Claims 1 and 2 of U.S. Patent No. 10,842,301 (the "'301 Patent") are obvious based on 35 U.S.C § 103 is incorrect.

First, Patent Owner secured objective evidence relevant to the issue of obviousness referred to as "secondary considerations." This includes evidence of commercial success. *In re Vamco Machine & Tool, Inc.*, 752 F.2d 1564, 224 USPQ 617 (Fed. Cir. 1985)." MPEP § 716.03(b), section II. Patent Owner's market share is evidence of commercial success. *Cable Electric Products, Inc. v. Genmark, Inc.*, 770 F.2d 1015, 226 USPQ 881 (Fed. Cir. 1985). Moreover, the market shift starting in 2019 to cooling pillows and mattress products rebuts a finding of obviousness.

Second, as stated in *Ex Parte Whirlpool Corporation*, Appeal 2013-008232, Reexamination Control No. 90/009,855, Patent 6,082,130, "[t]he length of the intervening time between the publication dates of the prior art and the claimed invention can also qualify as an objective indicator of non-obviousness." Here, there are several years between the 2017 priority date of '301 Patent and the publication date of three of the four prior art references (Lievestro 2003; Ohta 2007; Crawford 2014; Schneider 2016).

Third, Patent Owner can rebut a prima facie case of obviousness by presenting independent comparative test data showing that the claimed invention possesses

unexpectedly improved properties, or properties that the prior art does not disclose. If a person of ordinary skill in the art would have been surprised by Patent Owner's results, then the invention could not have been obvious.

Lastly, a "reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant" and are unlikely to produce the objective of the claimed invention. *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). Notably, the teaching and use of reticulated (porous) foam in the Schneider reference for a washable mattress assembly with layers teaches away from Patent Owner's novel process to create a cooling pillow/bedding in the '301 Patent.

As such, the Petition should be denied and this Panel should hold Claims 1 and 2 of the '301 Patent valid and enforceable.

II. THE '301 PATENT AND RELEVANT BACKGROUND

The '301 Patent, titled "COOLING PILLOW," issued on November 24, 2020, from U.S. Application 15/719,473, and was filed on September 28, 2017. The '301 Patent indicates priority to provisional application 61/367,840, filed on July 28, 2016. However, the U.S. Patent and Trademark Office ("USPTO") noted that the '301 Patent's claims are entitled to priority based on the '301 Patent's September 28, 2017

filing date . (Exhibit 1005, ‘251 Reexam, ¶ 7). It is this priority date of September 28, 2017 that is used herein.

The USPTO held the Non-Patent Literature presented in the July 7, 2023, *Ex Parte* Reexamination (“‘251 Reexam”) did not raise a substantial new question of patentability with respect to Claims 1 and 2 of the ‘301 Patent. (Exhibit 1005, ‘251 Reexam, ¶ 9(f)). Notably, the USPTO found in the ‘251 Reexam that, despite a lack of Reason for Allowance by the ‘301 Patent Examiner, original claims 11 and 12 (issued Claims 1 and 2) were allowed based on the subject matter of original Claims 11 and 12. This guidance provides insight as to why the ‘301 Patent was granted.

Specifically, Claim 11 (now issued Claim 1) was allowed because of the method step of: “Cracking said block” (the “cracking limitation”). (Exhibit 1005, ‘251 Reexam, ¶ 6). Claim 12 (now issued Claim 2) was allowed because of the method step of: “Compressing said block by pressing on said surface before the forming of the hole; and performing the forming of the hole while said block is compressed” (the “compressing and forming limitation”). *Id.*

This insight from the ‘251 Reexam as to the allowability of issued Claims 1 and 2 of the ‘301 Patent, based on the cracking limitation of Claim 1 and compressing and forming limitation of Claim 2, aids in the analysis of the prior art cited in the Petition.

Claim 1	Claim 2
A process for manufacturing bedding which comprises:	A process for manufacturing bedding which comprises:
(a) providing a solid, resilient, compressible foam block, said block having a surface;	(a) providing a solid, resilient, compressible foam block, said block having a surface;
(b) applying a phase change material to said surface;	(b) applying a phase change material to said surface;
(c) forming a hole into said block and through said surface; and	(c) forming a hole into said block and through said surface;
(d) cracking said block.	(d) compressing said block by pressing on said surface before the forming of the hole; and
	(e) performing the forming of the hole while said block is compressed.

The preamble and steps (a) through (c) of Claims 1 and 2 are identical. Step (d) of Claim 1 concerns the cracking limitation. Steps (d) and (e) of Claim 2 concerns the compressing and forming limitation. The compressing and forming limitation has a specific order of operation, where the foam block is compressed before the forming of the hole, step 2(d). This limitation coincides with step 2(e), where the hole is punched while the foam block is compressed.

III. PERSON OF ORDINARY SKILL IN THE ART

Patent Owner included declarations of experts Andrew Gross and Jeff Quinn to highlight the key considerations to establish a person of ordinary skill in the art in

the bedding industry during the 2016/2017 timeframe. (Exhibit 2001, Gross Decl.; Exhibit 2013, Quinn Decl.). A POSITA in the field of bedding materials relating to comfort to the user in 2017 would have experience in product development, material selection, understanding of the manufacturing processes for the input materials (e.g., foam blocks), final assembly, and commercial ramifications as to what will drive consumer and retailer acceptance of the resulting product. (Exhibit 2001, Gross Decl., ¶ 20; Exhibit 2013, Quinn Decl., ¶ 19).

A POSITA would be familiar with experimentation of product and process combinations for new product development and how to achieve results that will draw consumers to the product. (Exhibit 2001, Gross Decl., ¶¶ 21, 22; Exhibit 2013, Quinn Decl., ¶¶ 20, 21). While a bachelor's degree in engineering is helpful, practical, hands-on experience is more critical to understand the strengths and weaknesses of certain materials to make bedding products, along with the processes involved to produce bedding products. (Exhibit 2001, Gross Decl., ¶ 23; Exhibit 2013, Quinn Decl., ¶ 20).

IV. '301 PATENT CLAIM CONSTRUCTION

As to Claims 1 and 2 of the '301 Patent, both claims include the terms “solid, resilient, compressible foam block”. In the Decision (Paper 7, p. 13), the Board stated that the term “solid ... foam block” is readily understandable on its face and

did not find it necessary to expressly interpret this claim language. The Board permitted additional argument by the parties.

Patent Owner asserts that the term “solid” means “being without an internal cavity” and “of uniformly close and coherent texture: not loose or spongy.” (Exhibit 2010). Contrary to Petitioner’s interpretation, “solid” refers to the nature of the density of the object, not only that it keeps its own form rather than flow or spread. Having the solid foam block keep its own form is directed more towards the claim requirement of the foam block being “resilient”, as opposed to “solid”. A hollow cube tends to keep its own form but is not solid given the internal void (e.g., a cardboard Amazon box). Accordingly, the term “solid” should be interpreted according to its “plain and ordinary meaning”, which is an object without an internal cavity or where the density of the object has a uniformly close and coherent texture. This is in line with the specification’s description of creating a cooling effect through the punched holes in the PCM coated solid foam to direct a “rush of air that is cooled” to the user. (Exhibit 1001, ‘301 Patent, col. 12, lines 21-26).

Aside from the interpretation of the term “solid”, Patent Owner does not dispute the Board’s preliminary finding of Claim Construction as detailed in Decision (Paper 7), Section II (C).

V. CITED PRIOR ART REFERENCES

In this Section V, a brief overview of each of the cited prior references relied on by Petitioner is discussed to provide context for Patent Owner's legal arguments that follow.

A. Lievestro

The Lievestro reference (NL 1020305) discloses a device and method for continuously making holes in deformable foam blocks using rotating rollers. Lievestro solves the lead time of the drilling process used to cut holes in foam blocks, such as the platen process. Petitioner attempts to equate the drilling and rolling processes to place holes into foam blocks. Lievestro specifically avoids the drilling of holes in foam blocks using up and down movements by "configuring the die-roll body to compress the foam blocks and simultaneously punch holes in them during rotation." (Exhibit 1013, Lievestro, p. 3). When used with block feeders, Lievestro provides a continuous process of punching holes into the foam blocks. (Exhibit 1013, Lievestro, p. 4). Lievestro explicitly states that the advance of the invention is that holes can be made in the foam blocks through a continuous process. An added benefit of Lievestro is that the continuous process is faster than the up/down movement of a drilling process.

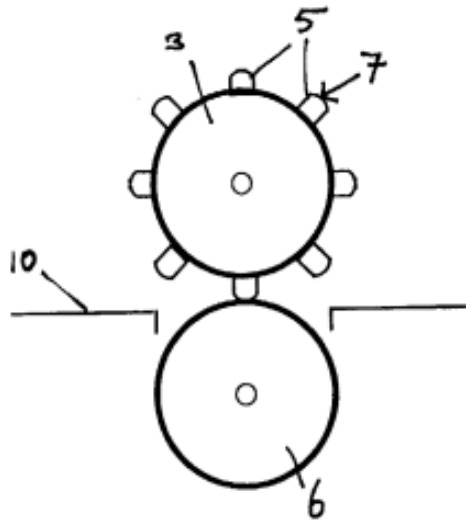


Fig. 1

Figure 1 of Lievestro

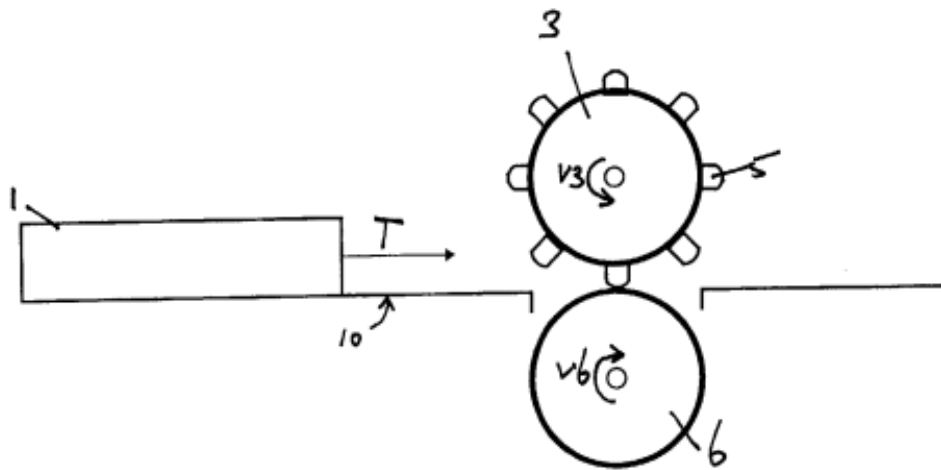


Fig. 3

Figure 3 of Lievestro

The use of a feeding system in Lievestro can vary the shape of the punched holes or the direction the holes extend in the block. (Exhibit 1013, Lievestro, p. 4). For example, instead of a 90-degree hole punch, Lievestro can be varied to provide non-perpendicular angles of the holes relative to the plane of the foam block passing

through the continuous rollers (Exhibit 1013, Lievestro, p. 4). As shown in Figure 4 of Lievestro (below), the cutting operation of holes into the foam block occurs at an angle as the foam passes through the cutters on the rollers. The foam block is compressed on a gradient based on the contact edge of the circular rollers. Comparatively, a drill press (platen press) presses down on a foam block with substantially uniform compression, which results in less impact to a PCM layer on the surface of the foam block.

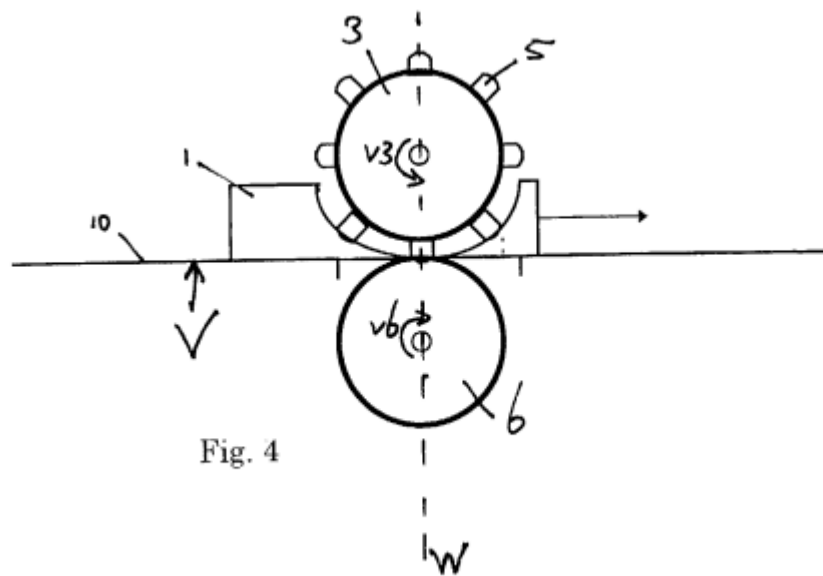


Figure 4 of Lievestro

Lievestro discloses compression of the foam blocks while simultaneously punching holes in the foam blocks during rotation of the rollers. (Exhibit 1013, Lievestro, p. 3). Lievestro teaches that the compression of the cell walls within the foam of the foam blocks results in a “relatively open cell structure that enhances the

comfort of the blocks during use.” (Exhibit 1013, Lievestro, p. 3). The compression in Lievestro creates a more comfortable foam block in the sense of resiliency of the compression of the foam when the user is laying on the foam block. However, Lievestro does not teach or suggest the idea of additional comfort to the user resulting from cool air travelling from inside the foam block to the outside of the foam block (with or without PCM on a surface) to the user. (Exhibit 2001, Gross Decl. ¶ 28).

B. Ohta

The Ohta reference (JP 4817757) discloses a method for manufacturing a perforated pillow having through holes. (Exhibit 1009, Ohta). Ohta teaches the removal of the “punched portion” (scrap portions) of foam after the punch or cutting operation creates holes in the pillow. (Exhibit 1009, Ohta, ¶ 0004). Ohta solved the problem of having to manually remove the punched portion of foam that remains in the foam after the cutting operation. (Exhibit 2001, Gross Decl. ¶ 93).

Ohta’s invention was focused on solving the problem of leaving the scrap portions of cut foam in the foam block. In the Background Art section, Ohta generally references that some “foam pillows are made of perforated foam that is pierced with holes to prevent the oppressive, muggy feeling during use.” (Exhibit 1009, Ohta, ¶ 0002).

The Ohta reference also discloses compressing a foam body (11) between two press bodies (21 and 31) to perform the cutting operation. (Exhibit 1009, Ohta, ¶ 0031). The compression rate is preferably 5% to 40% per the Ohta reference. (Exhibit 1009, Ohta, ¶ 0033). The compression only relates to the need to compress the foam body to perform the punching operation to cut holes in the foam body. The Ohta reference does not disclose any impact from the compression of the foam body on the cellular structure of the foam body. (Exhibit 2001, Gross Decl., ¶¶ 100-101).

Figure 3 of Ohta illustrates how the Ohta invention removes the punched out portions 13 from the foam body 11. Punching blades 51 are driven through one press body 31 and into the punching holes 22 of the other press body 21. (Exhibit 1009, Ohta, ¶ 0034). This occurs when the foam body is in a compressed state between the two press bodies 21, 31. Punching blades 51 push punched-out portions 13 out of foam body 11 and extrude through punching holes 22 of press body 21. Punching blades 51 pass through punching holes 31 of press body 31. Punching blades 51 then pass through foam body 11 and past punching holes 22 of press body 21. As a result, punched-out portions 13 are extruded through punching holes 22 of press body 21. Notably, punching blades 51 may or may not have sharpened edges. (Exhibit 1009, Ohta, ¶ 0034).

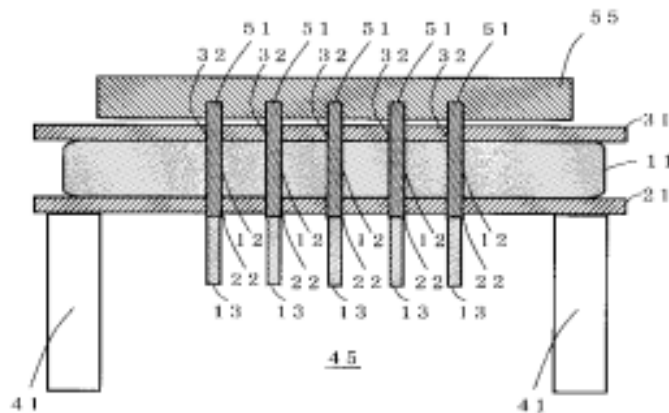


Figure 3 of Ohta

The Ohta invention is designed to remove the punched-out portions 13 from the foam body 11. Ohta does not disclose the impact on the cellular structure of the foam body 11 during the compression step, nor the impact or benefit or such compression. (Exhibit 2001, Gross Decl., ¶¶ 100-101). Ohta does not teach or suggest there is any benefit from compression of the foam block to the cellular structure of the foam itself, or the benefit the holes create to direct air from inside the foam body to the user (with or without PCM on the foam block).

C. Crawford

The Crawford reference (US2014/0141233) discloses a composition and method of making a novel liquid gel. Crawford’s focus is using the “liquid gel mixture for making surface-infused layers on layering substrates” at varying penetration depths. (Exhibit 1011, Crawford, Abstract).

Infused is defined as to be permeated with something or to inject. (Exhibit 2007, Infuse). Throughout the Crawford reference, the disclosure repeatedly teaches the liquid gel as being infused into the substrate. The liquid gel penetrates the open-celled polyurethane foam. (Exhibit 1011, Crawford, ¶ 0069). The liquid gel of Crawford is designed to be a carrier for other additives, such as PCM. (Exhibit 1011, Crawford, ¶¶ 0059-0061). Crawford's liquid gel is not simply a PCM, it is a gel that includes PCM or other additives. (Exhibit 2001, Gross Decl., ¶ 83). Crawford does not disclose applying PCM to a surface (as in the '301 Patent), only liquid gel with additives to be infused into a substrate. (Exhibit 2001, Gross Decl., ¶ 84). Crawford does not teach holes being formed in the foam. There is no reference in Crawford as to the PCM additive creating an active, perceptible cooling effect to the user. (Exhibit 2001, Gross Decl., ¶ 88).

Crawford teaches compression of the foam in the context of infusing the liquid gel deeper into the foam to impact the structure of the foam. Crawford discloses the "foam and surface-infused gel liquid may optionally be compressed to increase the gel penetration depth in the open-celled foam." (Exhibit 1011, Crawford, ¶ 0069). Compression, in the context taught by Crawford, increases the penetration of the liquid gel into the substrate.

The Petition focuses on the roller process depicted in Figure 19 of Crawford. Liquid gel 11 is deposited between rollers 8, 9. The liquid gel coated substrate 12 is

then compressed by rollers 10 to infuse the liquid gel mixture within the layering substrate. (Exhibit 1011, Crawford, ¶ 0072). “The product 13 is a substrate with a surface-infused gel liquid.” *Id.* As taught in Crawford, the purpose of the compression is to infuse the liquid gel 11 within the substrate. Crawford does not teach the change in cellular structure of the substrate (i.e., foam) to change the comfort level of the substrate, let alone a cooling effect to the user. (Exhibit 2001, Gross Decl., ¶¶ 85-87). Similar to Lievestro, the roller compression of Crawford is performed on a gradient as the substrate passes through the circular roller profile.

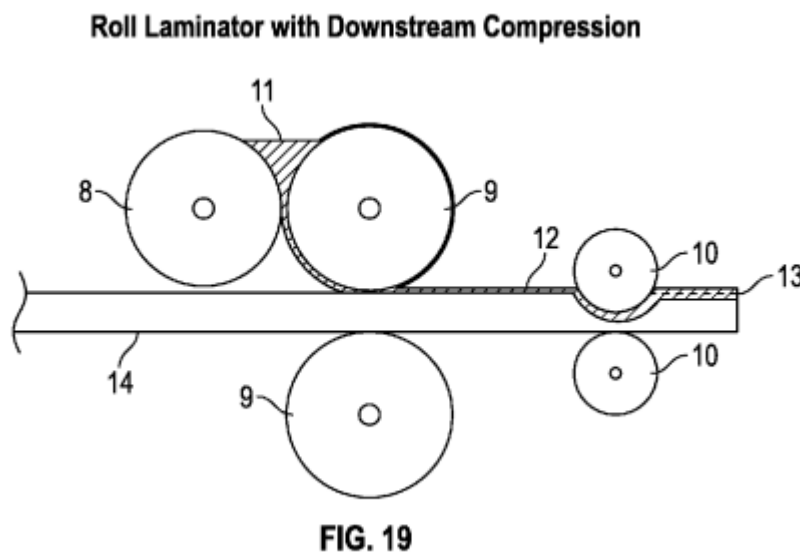


Figure 19 of Crawford

Figure 27 of Crawford has a similar operation where the liquid gel applied to the foam is pressed between rollers to infuse the liquid gel within the substrate. Crawford discloses spraying the liquid gel mixture on a non-planar substrate. (Exhibit 1011, Crawford, ¶ 0076). The resulting spray is infused into the substrate

using rollers, as shown in Figure 27. The foam in Crawford is “open cell”, which appears necessary for the liquid gel mixture to penetrate the foam and maintain the desired airflow. (Exhibit 2001, Gross. Decl., ¶ 89).

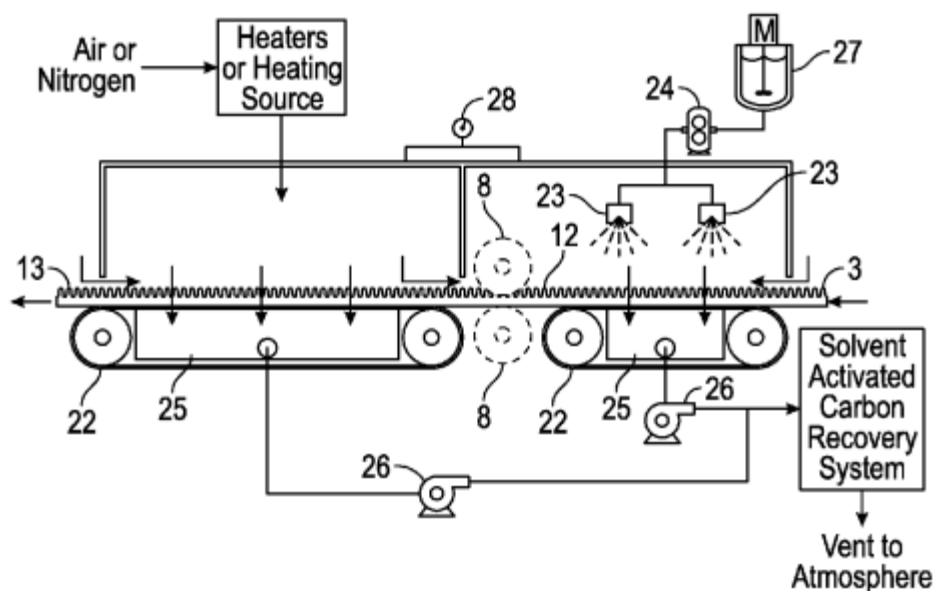


FIG. 27

Figure 27 of Crawford

D. Schneider

The Schneider reference (WO 2016/090258 A1) discloses a washable mattress assembly with an encasement and panels. The focus of the Schneider reference concerns the prevention of moisture penetration (i.e., a waterproof mattress assembly) into a mattress base (102). (Exhibit 1010, Schneider).

Schneider discloses that the foam (mattress base 102 and foam panels 128) is “reticulated” with a range of densities of the “cells (holes)” within the foam. (Exhibit

1010, Schneider, ¶¶ 0013, 0018, 0019). “Reticulated” means structured or arranged like a net, which is why reticulated foam has a lattice-like appearance. (Exhibit 2006, Reticulate; Exhibit 2001, Gross Decl., ¶60). Reticulation is a chemical/physical process during the foam forming, not a mechanical post-process like hole punching. (Exhibit 2001, Gross Decl., ¶61). The result is an extremely open cell material for certain specialty applications. (Exhibit 2001, Gross Decl., ¶¶ 62, 63). Schneider’s use of reticulated foam is to ensure a material will transmit moisture and hold up through the washing/drying process. (Exhibit 2001, Gross Decl., ¶¶ 63-65).

The absorbent foam 126 is on top of the mattress base 102 and is designed to be a waterproof barrier between the absorbent foam 126 and the mattress base 102. The title of element absorbent foam 126 says absorbent in its name, defining the purpose of absorbent foam 126. (Exhibit 1010, Schneider, ¶ 0017). The focus of Schneider is preventing moisture from penetrating into the mattress base 102. (Exhibit 2001, Gross Decl., ¶ 50). The absorbent foam 126 absorbs moisture. (Exhibit 1010, Schneider, ¶ 0017). Moreover, multiple foam panels 128 create absorbent foam 126. As shown in Figures 3, 6, and 8, multiple foam panels 128 are included in other layers on top of mattress base 102.

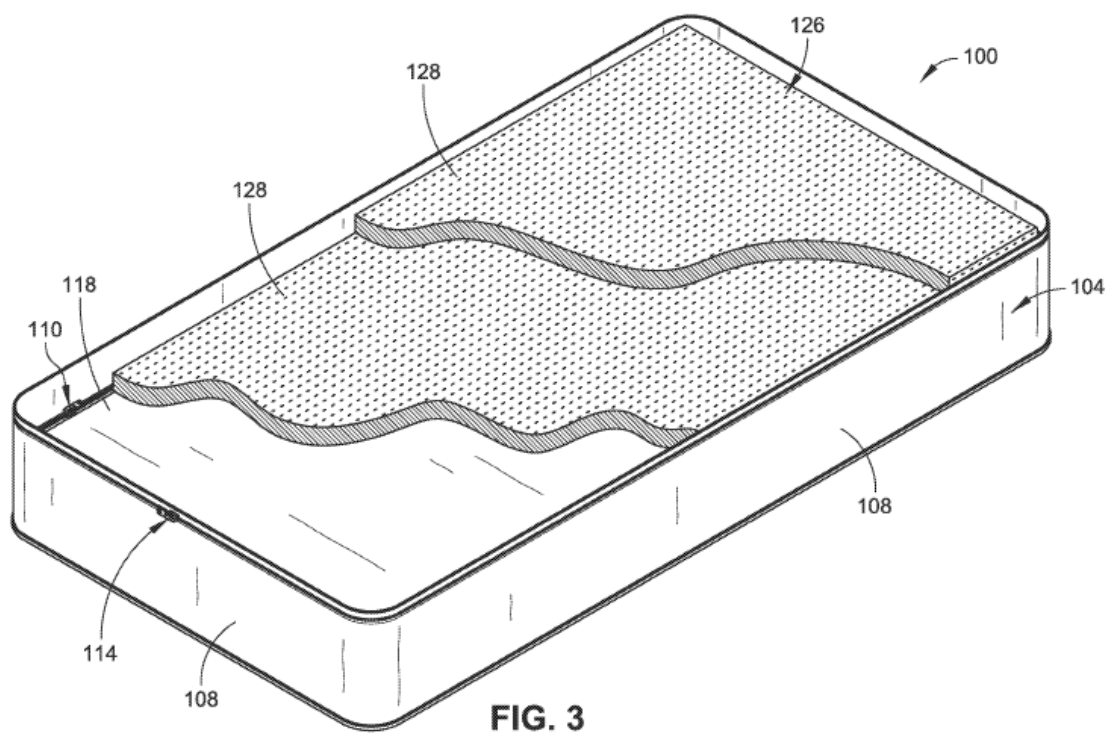


Figure 3 of Schneider

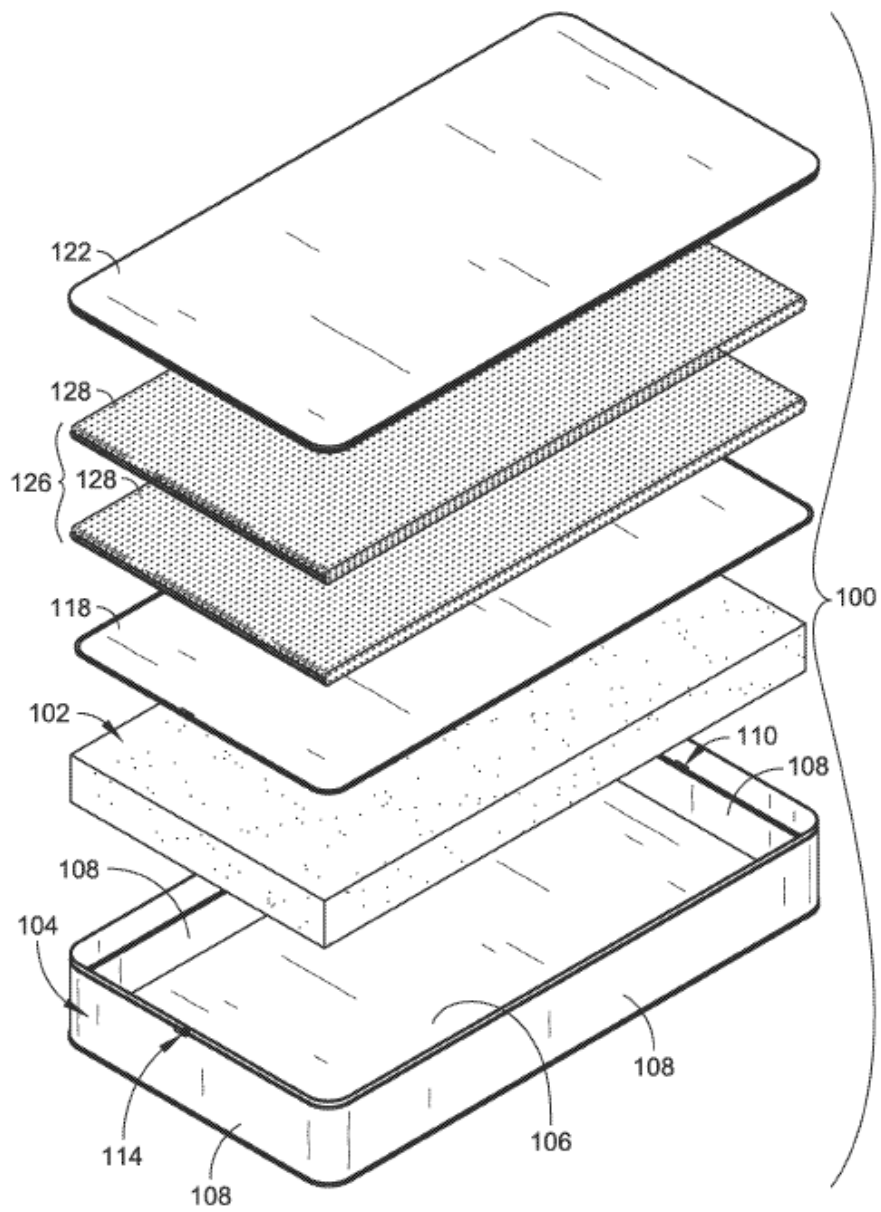


FIG. 6

Figure 6 of Schneider

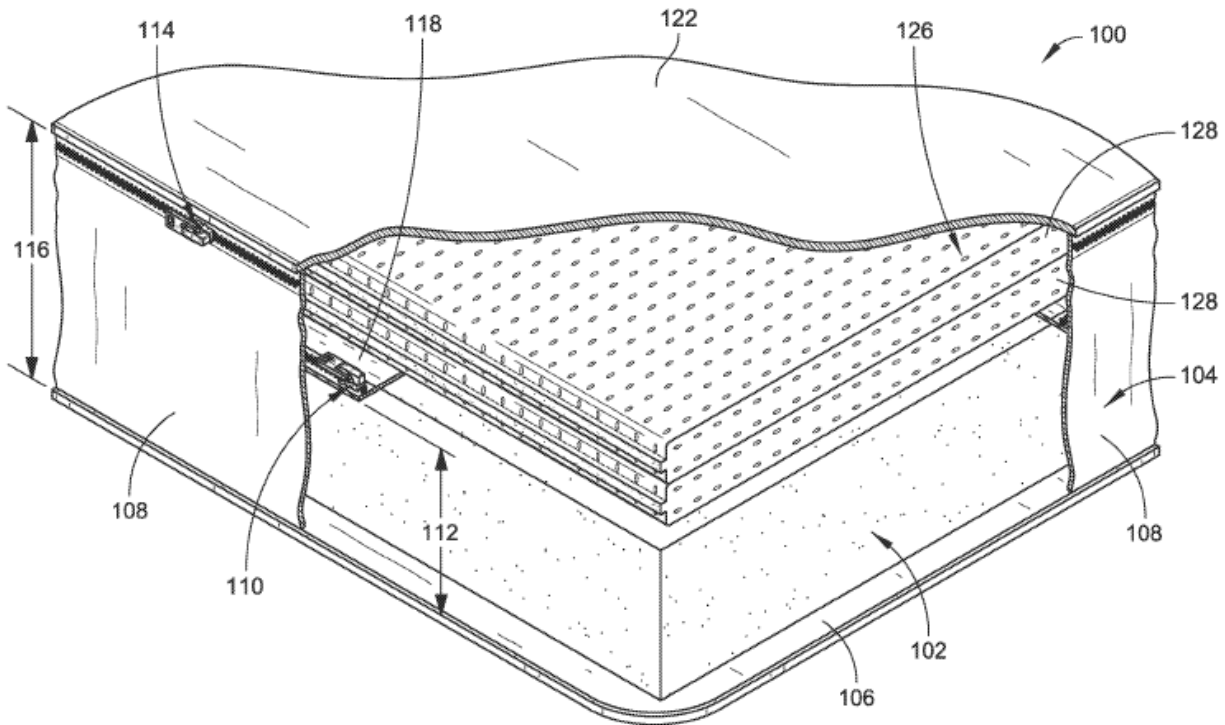


FIG. 8

Figure 8 of Schneider

Petitioner focuses on the “holes” in foam layers 128 that travel through the foam and its surface. See Petition page 62, Section V(D). However, Schneider does not disclose that “the foam layers 128 include holes through the foam and its surface”, as represented by Petitioner. The Schneider reference actually discloses that “the fabric coating the foam of foam panel 128 can be perforated (e.g., in the manner of a mesh) to allow moisture to penetrate into the foam.” (Exhibit 1010, Schneider, ¶ 0020). The perforation of the fabric coating (not foam) allows the foam panels to be removed, washed, dried, and reinserted into the mattress assembly. *Id.*

Schneider merely discloses that the fabric coating of foam panel 128 can have perforations. Schneider does not disclose perforations within the foam panel 128 itself. (Exhibit 2001, Gross Decl., ¶ 56). Viewing Figures 3, 6, and 8 without context can lead to the wrong conclusion. The disclosure of Schneider refers to perforations on a fabric coating that is around foam panel 128, not the foam panel 128 itself. *Id.* This is an important distinction.

To the extent Schneider discloses holes in the actual foam panel 128, and not a fabric coating as described, the holes are also located on the sides of the foam panels 128 as shown in Figures 6 and 8. The holes, as argued by Petitioner, travel through the sides of the foam panels 128 (laterally), not only top to bottom (longitudinally). This creates air paths in multiple directions, not a singular longitudinal direction to the user. (Exhibit 2001, Gross Decl., ¶¶ 71, 72). This is a common characteristic of reticulated foam, which has a porous non-solid structure. (Exhibit 2001, Gross Decl., ¶ 70).

Moreover, Schneider discloses multiple foam panels 128 that create absorbent foam 126. (Exhibit 1010, Schneider, ¶ 0018; Exhibit 2001, Gross Decl., ¶¶ 51, 52) The use of multiple layers of foam panels 128 inhibits the ability of the bedding to provide a cooling effect through the multiple foam panels 128. To the extent there are holes or perforations in the foam itself, which is not the case in Schneider, air passage would be blocked due to the misalignment and overlap of the holes in

multiple foam panels. However, Schneider does not disclose holes within the foam panels 128. If there were holes with foam panels 128, the use of multiple foam panels 128 would restrict air flow through the respective panels due the alignment of the holes. The design of Schneider is to provide a washable mattress assembly, not promote air flow through the foam panels 128. (Exhibit 2001, Gross Decl., ¶ 50).

Schneider discloses certain features that only apply to different layers of the mattress assembly. For example, panel 118 is in-between mattress base 102 and absorbent foam 126. Panel 118 (not absorbent foam 126 or the foam panels 128) is designed to be breathable and/or substantially waterproof material to “prevent the moisture [from absorbent foam 126] from penetrating through to the mattress base 102.” (Exhibit 1010, Schneider, ¶ 0017). Moreover, Schneider’s use of “mattress inserts” as additional layers around the mattress reduces air flow and the breathability of the mattress to the user. (Exhibit 1010, Schneider, ¶¶ 0023, 0024). There are anywhere from three to six mattress inserts layered on the Schneider mattress. (Exhibit 1010, Schneider, ¶ 0025). Schneider is designed to collect moisture and prevent the moisture from penetrating into the mattress base 102. (Exhibit 1010, Schneider, ¶ 0017). Schneider cannot be classified as breathable from the mattress base 102 to the user laying on the mattress assembly. (Exhibit 2001, Gross Decl., ¶¶ 76, 79).

The Petitioner also argues that Schneider discloses a phase change material. However, the reference to Rossi (WO2011/107849) includes an absorbent gel. (Exhibit 1010, Schneider, ¶ 0029; Exhibit 2001, Gross Decl., ¶ 76). Schneider refers to the gel's ability to absorb thermal energy on a layer of memory foam. Exhibit 2001, Gross Decl., ¶ 77). There is a distinct difference in the coating of gel on a removable layer of foam (i.e., foam panel 128 compared to mattress base 102) versus a coating of phase change material applied on a surface of a foam base with holes (as required in process of the '301 Patent).

VI. LEGAL STANDARD

In an inter partes review, the Petitioner shall have the burden of proving a proposition of unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e).

A. Obviousness

“What a reference teaches or suggests must be examined in the context of the knowledge, skill, and reasoning ability of a skilled artisan.” *Syntex (U.S.A.) LLC v. Apotex, Inc.*, 407 F.3d 1371, 1380 (Fed. Cir. 2005). The Federal Circuit reiterated the proper standard for teaching away with respect to obviousness: “a reference will teach away when it suggests that the developments flowing from its disclosures are unlikely to produce the objective of the applicant's invention.” *Id.* at 1380.

Moreover, a “reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *Depuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) *quoting Ricoh Co., Ltd. v. Quanta Computer Inc.*, 550 F.3d 1325, 1332 (Fed. Cir. 2008).

In a motivation to combine analysis, the “real question is ‘why a person of ordinary skill in the art would have combined elements from specific references *in the way the claimed invention does.*’” *Axonics, Inc. v. Medtronic, Inc.*, 73 F.4th 950, 957 (Fed. Cir. 2023)(emphasis in original, internal citations omitted). When an obviousness challenge asserts a combination of identified prior art, the motivation to-combine part of the analysis is “whether ‘a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve *the claimed invention.*’” *Id. quoting Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (internal citations omitted); *see also Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1361 (Fed. Cir. 2007).

The question is not whether a POSITA would combine a first reference’s feature with a second reference’s feature to meet requirements of the first reference that are not requirements of the claims at issue. *Axonics, Inc. v. Medtronic, Inc.*, 73 F.4th at 957. “A contrary view would run counter to established principles,

including that the claim defines the invention whose obviousness is being assessed and that a skilled artisan may be motivated to combine particular features of different references, *e.g.*, to secure some benefits at the expense of others, even when bodily incorporation would be impossible or inadvisable.” *Id.*

B. Expert Testimony

Petitioner’s expert, David M. Brienza, substantially repeats the arguments set forth in the Petition. An expert that merely repeats conclusory assertions in a petition should be given little weight by the Board. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 12 (Feb 10, 2023) (Vidal, Dir.). The Board may disregard expert testimony that does not provide factual support as to how the combination of references would render the relevant claims obvious. *InfoBionic, Inc. v. Braemar Manufacturing, LLC*, IPR2015-01704, Paper 11, (P.T.A.B. Feb. 16, 2016) (denying institution); see also 37 C.F.R. § 42.65(a).

VII. PATENT OWNER’S ANALYSIS

A. The ‘301 Patent is Not Obvious Based on the Cited Prior Art

1. The Prior Art Teaches Away from Patent Owner’s Invention

A prior art reference can be said to teach away when it suggests that the developments flowing from its disclosures are unlikely to produce the objective of the claimed invention. *See In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). MPEP § 2141.02(VI) states that “[a] prior art reference must be considered in its entirety,

i.e., as a whole, including portions that would lead away from the claimed invention.” (emphasis in original). Accordingly, where cited art teaches away from a claimed feature, the cited art is not available for the purposes of an obviousness rejection.

a. Lievestro Teaches Away from the ‘301 Patent Based on its Objective to Create a Faster Hole Cutting Operation, Not Compress or Crack a Comfort Layer to Aid in a Cooling Effect to the User.

Lievestro not only fails to teach or suggest the purpose of cutting holes in the foam block, the benefit of crushing the foam block, and the purpose of the compression, but it teaches away from the uses thereof. (Exhibit 2001, Gross Decl., ¶ 28). For instance, the ‘301 Patent discloses that the holes in the foam block are formed to enhance the feel and comfort of the pillow to the user. Furthermore, the holes are configured in the ‘301 Patent to create a “rush of air that is cooled by the cooling layer [PCM]” when the pillow is compressed thereby providing a cooling benefit to the user with the applicable bedding product. (Exhibit 1001, ‘301 Patent, col. 12, lines 22-24).

The Lievestro reference teaches away because the invention is described as “a device for making holes in deformable foam blocks such as mattress bodies.” (Exhibit 1013, Lievestro, p. 2). A “mattress body” is typically the support layer of the mattress and not necessarily the comfort layer, as would be the case for a pillow

or mattress topper. (Exhibit 2001, Gross Decl., ¶ 31). A mattress support layer is typically made from a flexible polyurethane foam with a higher firmness and less elasticity which would better facilitate the hole puncturing process. (Exhibit 2001, Gross Decl., ¶ 32). Lievestro does not specifically teach or disclose the specification type and range of the “deformable foam blocks” for which it is relevant. (Exhibit 2001, Gross Decl., ¶ 33). “Foam Blocks” can be comprised of different formulations (polyurethane, latex, etc.) and demonstrate different properties, such as firmness, density, elasticity, tear strength and recovery rate. *Id.* Each of these properties could influence the success of Lievestro’s invention.

For instance, a lower firmness, more elastic memory foam used in a pillow may be problematic for Lievestro’s continuous punching process due to the material’s elasticity properties, which could make it harder to maintain alignment of the foam through the rolling process (as opposed to a platen) and therefore more challenging to achieve consistent hole punctures. (Exhibit 2001, Gross Decl., ¶ 34; Exhibit 2004). The Polyurethane Foam Association’s (“PFA”) owner literature on viscoelastic foams notes the challenges of fabricating viscoelastic foams and the need to run processes more slowly to account for properties such as recovery rate. (Exhibit 2001, Gross Decl., ¶ 34; Exhibit 2004). This may be why Lievestro discloses that its machine can operate with foam blocks up to 400 cm (13 feet) high. (Exhibit 2001, Gross Decl., ¶¶ 46-48). As such, the Lievestro reference teaches

away from many of the fundamental technical requirements of the process described in Claims 1 and 2 of the ‘301 Patent to create a cooling pillow.

The Petition argues that Lievestro discloses step 1(d) and steps 2(d), 2(e) of the ‘301 Patent, that is the cracking limitation and the compressing and forming limitation. Petition, p. 24-29. As for the benefits of crushing the foam, Patent Owner discloses that the benefit of crushing/compressing the foam is to open the cell wall structure. (Exhibit 1001, ‘301 Patent, col. 3, lines 39-50). Opening the cell wall structure is beneficial because it improves air flow through the material and better ensures that the firmness/softness of the pillow that is experienced on day one of use will be closer to that experienced over time. (Exhibit 2001, Gross Decl., ¶¶ 37, 38). Lievestro does not teach or suggest the benefits of crushing the foam in order to open the cell wall structure. (Exhibit 2001, Gross Decl., ¶ 39). While Lievestro does mention a secondary benefit of crushing the foam at the moment of hole puncture, it does not teach or suggest the level of compression (deformation of the foam), the duration of this deformation, and the resultant impact to the cell structure of the foam. (Exhibit 2001, Gross Decl., ¶ 40). The Patent Owner’s process in the ‘301 Patent describes and claims the foam being compressed and then punched while compressed (or “cracked”). For Lievestro, it is not clear that the process would produce a meaningful benefit. (Exhibit 2001, Gross Decl., ¶ 42). Thus, it is not clear that the Lievestro process would provide a meaningful benefit from the compression

of the foam, aside from Lievestro's stated objective of a continuous hole punch invention.

In addition, a POSITA would not consider the method disclosed in Lievestro of hole punching a PCM laminated foam due to risk of the roller press causing more damage/delamination to the PCM material versus a platen punch system. (Exhibit 2001, Gross Decl., ¶ 43). The combination of the continuously run rollers and friction between the rollers and foam may result in a higher operating temperature compared to a flat press. (Exhibit 2001, Gross Decl., ¶¶ 42-44). This heat could transfer to the foam and jeopardize the integrity of a foam itself, along with tearing and rupturing of a PCM coating. (Exhibit 2001, Gross Decl., ¶¶ 124, 125). In view of these arguments, Lievestro teaches away from the Patent Owner's patented process.

b. Schneider Teaches Away from the '301 Patent Based on its Use of Reticulated Foam, Which a POSITA Would Know is Commonly Used in Wet Environments and Not a Comfort Layer for Bedding.

Schneider not only fails to teach or suggest the hole punch process disclosed in the '301 Patent, but it teaches away from the use thereof. (Exhibit 2001, Gross Decl., ¶ 53). Schneider teaches away from the '301 Patent because it is not using foam that is punched, but rather reticulated foam, which is polyurethane foam created by an entirely different process and for a different purpose. (Exhibit 2001,

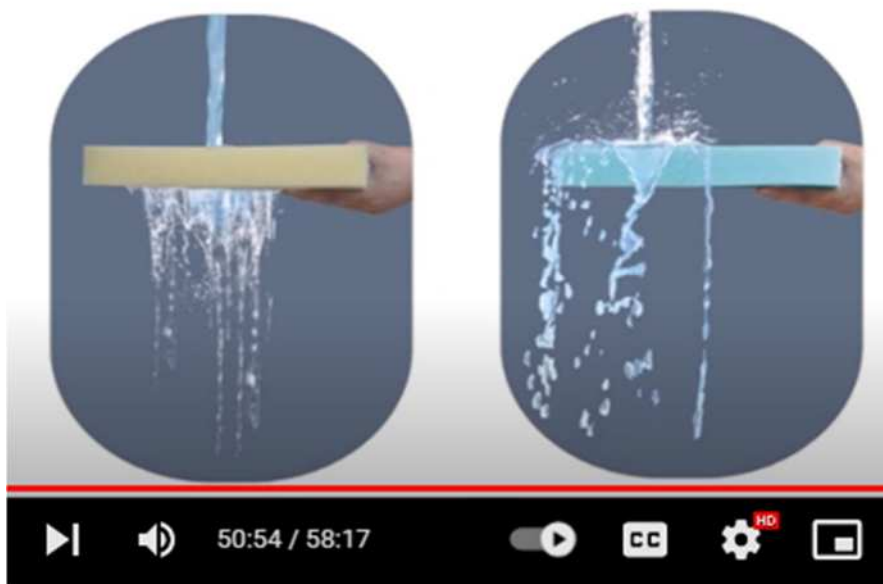
Gross Decl., ¶ 54). While the Petition argues that Figures 6 and 8 in Schneider show layers with “holes”, implying a hole punch process to ventilate the foam, Schneider specifically discloses the foam being “reticulated” with a range of densities of the “cells (holes)” within the foam. (Exhibit 2001, Gross Decl., ¶ 55). The “holes” represented in Figures 6 and 8 in Schneider are either a poor representation of the porosity of reticulated foam itself, or perforations in the “fabric coating the foam of a foam panel 128” as described in Schneider. (Exhibit 2001, Gross Decl., ¶ 56; Exhibit 1010, Schneider, ¶ 20). Schneider states that the reticulated foam layer can be housed inside a foam mesh encasement to maintain its position in the fabric cover during washing. (Exhibit 2001, Gross Decl., ¶ 57). Therefore, Schneider teaches away from the ‘301 Patent.

Background about reticulation is important to understand the distinction of Scheider. Reticulation is a chemical/physical process to create the foam, not a mechanical post-process like punching. (Exhibit 2001, Gross Decl., ¶ 61). The ‘301 Patent details a mechanical post-foam formation process, such as punching, unlike the reticulation process described in Schneider. (Exhibit 2001, Gross Decl., ¶ 59). Reticulation means “structured or arranged like a net,” which is why reticulated foam has a net or lattice-like appearance. (Exhibit 2001, Gross Decl., ¶ 60; Exhibit 2006, Reticulated; Exhibit 2009 found at <https://www.youtube.com/watch?v=5XThFsqqUvU&t=4s>). The foam producer

uses either a chemical or thermal process to break down the cell walls in the produced foam block, leaving only the lattice structure intact. (Exhibit 2001, Gross Decl., ¶ 62). As depicted below, the result is a low density, extremely porous material used for certain specialty applications and generally not as comfort layer in a mattress. (Exhibit 2001, Gross Decl., ¶¶ 62, 63).



For instance, reticulated foam is commonly used in outdoor seat cushions to ensure the cushion will drain quickly following a rainstorm. (Exhibit 2001, Gross Decl., ¶ 64). A visual representation of water pouring through reticulated foam (passing through) and non-reticulated foam (creating a barrier) is shown in Andrew Gross' declaration and below. (Exhibit 2001, Gross Decl., ¶ 64).



Reticulated foam can be found in household products, such as scrub sponges (e.g., Scrub Daddy), where the combination of the foam's rigidity, porosity and glass transition point (where the foam changes from rigid to flexible) allow the reticulated foam sponge to function as either an abrasive or a gentle, quick rinsing pot scrubber depending on water temperature. (Exhibit 2001, Gross Decl., ¶ 65).

For the reasons stated above, reticulated foam is typically not used for comfort layers in a mattress, pillow or topper because it is typically either too hard to be comfortable or too soft to be supportive. (Exhibit 2001, Gross Decl., ¶¶ 66, 67). The reticulated foam in Schneider teaches away from the '301 Patent because the non-reticulated hole punched foam used in the '301 Patent process is done to provide comfort to the user, both directly through the foam and to provide a gust of cool air

to the user. (Exhibit 2001, Gross Decl., ¶¶ 68; Exhibit 1001, ‘301 Patent, col. 12, lines 22-24).

In addition, reticulated foam is not a strong candidate to be hole punched as punching the porous material would likely tear the lattice structure, thus weakening the foam. (Exhibit 2001, Gross Decl., ¶ 69). From a practical standpoint, due to reticulated foam’s natural porosity, hole punching would provide minimal added benefit for targeted air flow to create a cooling effect to the user. (Exhibit 2001, Gross Decl., ¶¶ 70-73). Air cannot be routed to a certain direction, such as outwardly to the user, based on the porosity of reticulated foam.

Furthermore, the porosity of reticulated foam also makes it hard to generate the active vertical airflow to the user characterized by the Patent Owner’s process in the ‘301 Patent. (Exhibit 2001, Gross Decl., ¶ 79). When reticulated foam is compressed, air is displaced in all directions given the porosity of reticulated foam. (Exhibit 2001, Gross Decl., ¶ 72). This fact teaches away from the ‘301 Patent because in the Patent Owner’s process and disclosure, the punched holes are punched through the top surface of the pillow to direct the airflow vertically, to maximize the cooling effect of the airflow to the user. (Exhibit 1001, ‘301 Patent, col. 12, lines 18-24.

Reticulated foam is also not a good candidate for the application of PCM to the surface of the foam because the structure of reticulated foam has far less surface

contact area and far greater porosity than a typical polyurethane and viscoelastic foam. (Exhibit 2001, Gross Decl., ¶ 74). Therefore, it would be hard to concentrate the PCM on the surface of the reticulated foam to produce the targeted cooling effect of the ‘301 Patent. (Exhibit 2001, Gross Decl., ¶ 75). Again, this demonstrates that the Schneider reference teaches away from the ‘301 Patent.

In addition, Schneider’s use of reticulated foam is to ensure that the comfort material within the cover will easily transmit moisture and hold up through the washing/drying process effectively. (Exhibit 1010, Schneider, ¶ 0028). However, a POSITA in the bedding industry would understand that practically, reticulated foam is not practical for use as a comfort layer in bedding materials. (Exhibit 2001, Gross Decl., ¶ 66). While the reticulated foam in Schneider may be effective from a washability standpoint, the stated objective of Schneider, it is not a preferred option for comfortable bedding materials. In view of these arguments, Schneider teaches away from the ‘301 Patent.

2. Motivation to Combine the Prior Art References

When relying upon multiple references to attempt to show obviousness, the challenger must explain why one of ordinary skill in the art would be motivated to combine or modify the references and what would have provided the basis of a reasonable expectation of success. As the Supreme Court noted in *KSR Int’l Co. v.*

Teleflex Inc., 550 U.S. 398, 418 (2007), there must be “a reason” for a skilled artisan “to combine the elements in the way the claimed new invention does.”

Tellingly, none of the four combinations of prior art cited in the Petition disclose the cracking limitation or the compressing and forming limitation. The cracking limitation results in a foam block that enhances “the comfort and feel in bedding” due to a cracked foam blocks “compressibility and resilience.” (Exhibit 1001, ‘301 Patent, col. 3, lines 39-50). The compression and forming limitation achieve the same purpose. In the context of the ‘301 Patent process, the cracking and compression/formation steps of 1(d) and 2(d), (e), contribute to the modification of the foam block to create a comfortable, cooling effect to the user.

Moreover, step (b) of Claims 1 and 2 require applying the PCM to the surface of a foam block. The cited prior art refers to an infused liquid gel (Crawford) and an absorbent gel (Schneider), which as applied, fails to meet the required claim limitation of applying a PCM on a surface of a foam block.

a. There is No Motivation to Combine Lievestro in View of Schneider Given the Ineffectiveness of a Continuous Hole Punching Operating Cutting Reticulated Foam.

The Petition argues that Lievestro is only missing step (b) of Claims 1 and 2 of the ‘301 Patent, application of PCM to the surface of the “solid, resilient, compressible foam block.” Petition, p. 24-29. However, a POSITA would not be motivated to combine or modify Lievestro in view of Schneider because there would

be no reasonable expectation of success and the references, and when combined, would not provide the limitation of application of a PCM on the surface of a foam block. (Exhibit 2001, Gross Decl., ¶ 104). The principal issue here is Petitioner's misinterpretation of Schneider. The supposed foam with holes is actually reticulated foam. (Exhibit 2001, Gross Decl., ¶¶ 105). This is an entirely different class of material intended for different purposes, as outlined in Schneider. (Exhibit 2001, Gross Decl., ¶ 106).

Schneider's reference to applying a PCM to a foam layer speaks to the upholstery layers of Schneider's mattress construction, which is separate from the washable, reticulated foam layer that is attached to the mattress cover. (Exhibit 2001, Gross Decl., ¶ 107). Schneider's reference to is to an absorbent gel that acts as a waterproof barrier above the upholstery layers of the mattress, which negates airflow through those layers of the mattress. (Exhibit 2001, Gross Decl., ¶ 76; Exhibit 1010, Schneider, ¶ 0029).

Based on the correct interpretation of Schneider, a POSITA would not be motivated to combine the hole punch process described in Lievestro with a water resistant PCM coated foam block that is intended to be a water barrier to the lower upholstery layers of a mattress, as opposed to the comfort layer of a pillow as created from Claims 1 and 2 of the '301 Patent. (Exhibit 2001, Gross Decl., ¶ 108). Plus, a POSITA would not have coated the surface of Schneider's foam panels, or the

mattress base, given the porous nature of the reticulated foam and the water-resistant nature of the gel. (Exhibit 2001, Gross Decl., ¶¶ 111, 112). A POSITA in 2016/2017 would have not been motivated to combine reticulated foam with an absorbent gel water barrier (Schneider), with the continuous rolling process of Lievestro. (Exhibit 2001, Gross Decl., ¶ 112).

Moreover, combining Lievestro in view of Schneider would not lead to a successful product because: 1) a reticulated foam pillow would not be acceptable from a comfort perspective; and 2) would be challenging to apply PCM to the surface of a foam block in a way that would yield the demonstrable cooling effect created by Claims 1 and 2 of the '301 Patent. (Exhibit 2001, Gross Decl., ¶ 109). First, while reticulated foam is effective to permeate water for washability (Schneider's objective), the use of reticulated foam is not generally considered practical or used as a comfort layer in the industry. (Exhibit 2001, Gross Decl., ¶ 116). A POSITA would not have been motivated to combine Lievestro in view of Schneider given Schneider's use of reticulated foam to achieve washability. (Exhibit 2001, Gross Decl., ¶ 114).

Second, Lievestro does not disclose a cooling effect to the user through the holes in the foam. A POSITA would not be motivated to combine Lievestro in view of Schneider to create the process of the '301 Patent, which states that an objective of the process is to create a pillow that "creates a flow of cooled air when the pillow

is compressing” by the user. (Exhibit 1001, ‘301 Patent, col. 2, lines 65-67; Exhibit 2001, Gross Decl., ¶ 113). Moreover, the combination would prove challenging to apply PCM to the surface of a foam block in a way that would yield the demonstrable cooling effect with the air flow properties along the vertical dimension as described in the ‘301 Patent. (Exhibit 2001, Gross Decl., ¶ 109). It is questionable whether Lievestro’s process would function for viscoelastic polyurethane foams, such as those contemplated by the ‘301 Patent. (Exhibit 2001, Gross Decl., ¶¶ 33, 34, 120). The use of Schneider’s reticulated foam with punched holes (Lievestro) would not generate targeted air flow like the process of Claims 1 and 2 of the ‘301 Patent. (Exhibit 2001, Gross Decl., ¶ 115).

From a practical standpoint, Lievestro’s continuous rolling process creates two distinct issues that would negate its combination with a PCM layer. If PCM is applied to the foam in Lievestro, the continuous rolling process may generate excessive heat that will transfer to the foam and PCM. (Exhibit 2001, Gross Decl., ¶ 124). The buildup of heat transferred to the foam from the constant movement of the rollers against the foam may compromise the integrity of a PCM layer on the foam. (Exhibit 2001, Gross Decl., ¶ 125). In addition, Lievestro’s rolling process uses circular rollers (see Figure 4 of Lievestro). The rollers create a gradient compression force on the foam based on the circular profile of the rollers. (Exhibit 2001, Gross Decl., ¶ 126). If PCM is on the surface of the foam, the non-uniform

force exerted by the rollers on the PCM surface coated foam may impact the integrity of the PCM. (Exhibit 2001, Gross Decl., ¶ 126). The use of a platen punch system, like the ‘301 Patent process, applies more uniform pressure on the PCM laminated foam during the cutting operation. (Exhibit 2001, Gross Decl., ¶ 127).

In view of these arguments, combining Lievestro in view of Schneider would not lead to success because the end product would not result in a useful cooling pillow like the process claimed in the ‘301 Patent.

b. There is No Motivation to Combine Crawford in View of Lievestro as the Liquid Gel is for Passive Heat Transfer, and Would Not Function with a Continuous Roller Process to Create a Cooling Effect to the User

A POSITA would not be motivated to combine or modify Lievestro in view of Crawford because there would be no reasonable expectation of success. (Exhibit 2001, Gross Decl., ¶ 129). The Crawford reference discloses compressing foam to 90% of its height for the purpose of enhancing the infusion of the liquid gel mixture during the lamination process; not specifically to “crack” or open the cells of the foam as required by step 1(d) and steps 2(d), 2(e) to provide comfort to the user. (Exhibit 2001, Gross Decl., ¶ 129). Crawford’s process improves heat transfer in foam incorporating a penetrating gel, which enables passive heat transfer. (Exhibit 2001, Gross Decl., ¶ 130). In contrast, the cooling effect to the user from the cooling

pillow created by the process of Claims 1 and 2 of the ‘301 Patent is an active, perceptible cooling effect to the user. (Exhibit 2001, Gross Decl., ¶ 130).

In fact, the Crawford reference assumes the foam substrate is already an “open cell” material typically defined as having an airflow above 2 cfm, which is necessary for the gel mixture to penetrate the foam in a way that maintains the desired airflow and provides the enhanced thermal properties disclosed in Crawford. (Exhibit 2001, Gross Decl., ¶ 131). A POSITA would not necessarily interpret that this compression step would also enhance the breathability of a foam that is already described as “open cell”. (Exhibit 2001, Gross Decl., ¶ 132; Exhibit 1011, ¶11). Given that the Crawford foam is already described as “open cell”, a POSITA would not see any reason to combine it with Lievestro to add holes to further increase airflow. (Exhibit 2001, Gross Decl., ¶ 133). Moreover, neither Crawford nor Lievestro discloses airflow to the user. (Exhibit 2001, Gross Decl., ¶ 143). The ‘301 Patent does not disclose the absorption of heat, it discloses a cooling effect to the user by air passing through the holes and the PCM surface of the foam block. (Exhibit 2001, Gross Decl., ¶¶ 143, 144).

While Petitioner’s expert Mr. Brienza argues that it would be a simple mechanical process change for a POSITA to add one of Lievestro’s die rollers into the Crawford process either before or after the gel/PCM application, this proposition ignores the practical challenges in the application and curing of phase change

materials applied to the surface of foam, challenges that would be well known to a POSITA. (Exhibit 2001, Gross Decl., ¶ 134). A POSITA reading the Crawford reference would not be motivated to add a hole cutting process prior to lamination as the laminated material (PCM) would potentially build up in the holes, which would defeat the purpose of adding the holes (air flow), and otherwise complicate the curing process. (Exhibit 2001, Gross Decl., ¶ 135). The gel described by Crawford would be prone to clogging or sticking to the punching apparatus of Lievestro. Similarly, a POSITA would not be motivated to add the Lievestro die roller system after application of PCM layer given the curing time needed for the PCM. (Exhibit 2001, Gross Decl., ¶ 136).

In addition, it is not clear that Lievestro would function for the foam material types listed in Crawford as these foam materials have properties, such as elasticity, tear strength, and recovery, that are not easily compatible with the Lievestro continuous die roller punching process. (Exhibit 2001, Gross Decl., ¶ 137). Combining Crawford in view of Lievestro to form a hole in the foam block, as required in Claims 1 and 2 of the '301 Patent, would not lead to the successful process to create a cooling pillow. Plus, Lievestro may not be effective for foam blocks or comfort materials, i.e., a pillow of premium mattress topper, greater than 4 cm. (Exhibit 2001, Gross Decl., ¶ 138).

A POSITA would not conclude that cracking/compression would achieve a meaningful change in the cell structure of the foam or that adding a hole punch stage to the process is either necessary or feasible from a manufacturing perspective. The combination of Crawford in view of Lievestro would not lead to success because, from a process point of view, such combination will not be feasible to manufacture a product at the rate needed. (Exhibit 2001, Gross Decl., ¶ 139).

As noted above, Lievestro's continuous process with metal rollers and permanent punches may cause a built up of heat, which can transfer to the foam being fed through the system. (Exhibit 2001, Gross Decl., ¶¶ 141, 142). This heat could jeopardize the integrity of the PCM layer on the foam, which is critical for the cooling effect generated from the process of the '301 Patent. (Exhibit 2001, Gross Decl., ¶ 142). Based on Crawford's objective to infuse the liquid gel carrier into a substrate, a POSITA would not combine Crawford in view of Lievestro to create the process of Claims 1 and 2 of the '301 Patent. (Exhibit 2001, Gross Decl., ¶ 146).

c. There is No Motivation to Combine Ohta in View of Schnieder Due to the Reticulated Foam Getting Caught During the Punched Foam Ejection Process, and the Ineffective Use of a Water Barrier of PCM Infused Water Resistant Gel on Foam to Create a Cooling Effect to the User.

A POSITA would not be motivated to combine or modify Ohta in view of Schnieder because there would be no reasonable expectation of success. (Exhibit 2001, Gross Decl., ¶¶ 150). Ohta describes punching holes in the foam to prevent a

muggy feeling of the pillow but fails to disclose a cooling effect to the user from the bedding. (Exhibit 2001, Gross Decl., ¶¶ 147, 148; Exhibit 1009, ¶ 002). The objective of Ohta is to efficiently eject the punched pieces of foam. (Exhibit 2001, Gross Decl., ¶ 149).

While Schnieder teaches that an upholstery layer of his mattress system may be comprised of a water barrier with PCM infused water resistant gel, this is entirely separate from the washable, reticulated foam layer attached to the mattress cover that Petitioner has been misinterpreted as having “holes.” (Exhibit 2001, Gross Decl., ¶ 152). A POSITA would not read the Schneider reference as completing the ‘301 Patent claims in combination with the Ohta reference, let alone be motivated to combine Ohta in view of Schnieder. It is unclear whether the types of mattress upholstery layer foam materials disclosed in Schneider would fall into the range of materials disclosed in Ohta, thus rendering the probability of yielding a successful product uncertain. (Exhibit 2001, Gross Decl., ¶ 153).

The use of Schneider’s reticulated foam with Ohta’s punched holes would likely lead to inconsistencies during Ohta’s punched hole removal process. (Exhibit 2001, Gross Decl., ¶ 155). Reticulated punched foam holes will behave differently when punched compared to the foam described in Ohta. (Exhibit 2001, Gross Decl., ¶ 155). Combining the reticulated foam described in Schneider with Ohta’s process would yield a poor comfort product to the user, possibly prone to defects in the foam

due to potential tearing of Schneider's reticulated material during the Ohta cutting operation and punched hole removal step. (Exhibit 2001, Gross Decl., ¶ 154). This may result in stoppage of the Ohta cutting operation due to the improper ejection of reticulated punch holes. In view of these arguments, a POSITA would not conclude that the combination of Ohta in view of Schnieder would lead to success. (Exhibit 2001, Gross Decl., ¶ 156).

d. There is No Motivation to Combine Ohta in View of Crawford Due to the Type of Foam Used with Liquid Gels, and Foam Used for the Punched Hole Ejection Process.

A POSITA would not be motivated to combine or modify Ohta in view of Crawford because there would be no reasonable expectation of success. (Exhibit 2001, Gross Decl., ¶ 157). Crawford teaches the process to apply a PCM infused gel (or other gel additives) to an "open cell" foam, providing additional thermal benefits. (Exhibit 2001, Gross Decl., ¶ 160). Crawford uses a liquid gel as a carrier for PCM, as opposed to PCM being applied on a surface of foam. (Exhibit 2001, Gross Decl., ¶ 161). The Crawford reference does not refer to other processes to increase airflow or thermal activity, such as punching holes. (Exhibit 2001, Gross Decl., ¶ 162). Crawford assumes that the foam materials already have strong air flow, and such a step would be unnecessary. (Exhibit 2001, Gross Decl., ¶ 163). A POSITA familiar with the state of the art, including the Crawford reference and

commercial success related to open cell memory foams, would not be motivated to add holes to these materials. (Exhibit 2001, Gross Decl., ¶ 164).

Ohta does not disclose the compression and cracking steps in Claims 1 and 2, in conjunction with PCM, to create a cooling effect to the user. (Exhibit 2001, Gross Decl., ¶ 159). Ohta describes a process to add and extract holes to a pillow to improve thermal properties, i.e., preventing a muggy feeling in the pillow itself. (Exhibit 2001, Gross Decl., ¶ 165). Ohta references that the underlying materials would be a class of polyurethane foams that would include foams with viscoelastic (memory) properties. (Exhibit 2001, Gross Decl., ¶ 166). Ohta also discloses that the foam pillow would be a molded product, which often has an outer “crust,” resulting from how cleanly it is released from the foam mold that can limit airflow through the product. (Exhibit 2001, Gross Decl., ¶ 167). The Ohta reference does not mention that these foams are “open cell”. At the time of the Ohta patent application in 2005, effective premium open-cell foams were just emerging on the market. (Exhibit 2001, Gross Decl., ¶ 168). The hole punching process in Ohta is necessary to add airflow to the product (and eject the punched holes), while such a hole punching operation is not necessary for the product described in Crawford. (Exhibit 2001, Gross Decl., ¶ 169).

Moreover, it is not clear if the material created through the process in Crawford would be amenable to such punching, even after sufficient cure time.

(Exhibit 2001, Gross Decl., ¶ 170). The liquid gel in Crawford may be prone to clogging or sticking to the punching apparatus in Ohta. (Exhibit 2001, Gross Decl., ¶ 171). This could cause machine downside as well. Thus, combining Ohta in view of Crawford would not lead to the successful product as described in the process of the ‘301 Patent to create a cooling pillow. (Exhibit 2001, Gross Decl., ¶ 172).

B. Secondary Considerations Rebut a Finding of Non-Obviousness

Petitioner summarily dismisses the notion of any evidence supporting a claim for secondary considerations. Petition, Section VI(E). Such a blanket statement runs afoul of the market shift to cooling technology in bedding over the past 7-8 years. See Section VII(A)(2), *infra*. Notably, since 2020 Petitioner itself has sold numerous bedding products that include cooling technology created by the process of the ‘301 Patent. Starting in 2024, Petitioner revised their mattress models in an attempt to design around the process protected by the ‘301 Patent.

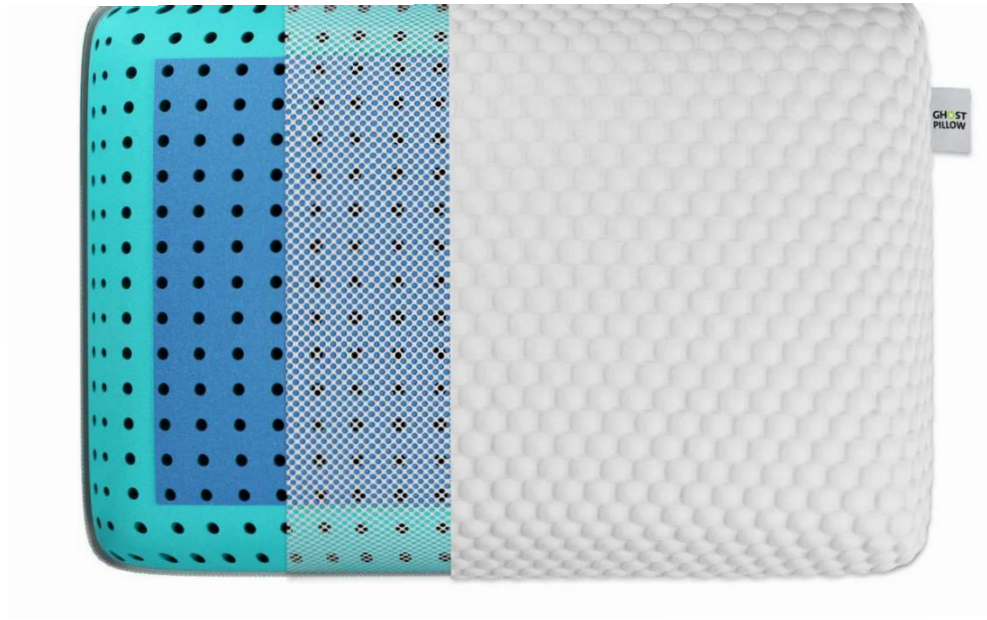
1. There is Objective Evidence of Commercial Success that Negates a Finding of Obviousness

Patent Owner’s product, which is made using the process claimed in the ‘301 Patent, has been hugely successful in the marketplace, which negates against a conclusion of “obviousness”. To support this conclusion, “an applicant must show that the claimed features were responsible for the commercial success of an article if the evidence of non-obviousness is to be accorded substantial weight.” *See In re Huang*, 100 F.3d 135, 140, 40 USPQ2d 1685, 1690 (Fed. Cir. 1996) (inventor’s

opinion as to the purchaser's reason for buying the product is insufficient to demonstrate a nexus between the sales and the claimed invention). MPEP 716.03(b) § IV, states "Gross sales figures do not show commercial success absent evidence as to market share *Cable Electric Products, Inc. v. Genmark, Inc.*, 770 F.2d 1015, 226 USPQ 881 (Fed. Cir. 1985) (overruled on other grounds by *Midwest Indus., Inc. v. Karavan Trailers, Inc.*, 175 F.3d 1356, 50 USPQ2d 1672 (Fed. Cir. 1999)), or as to the time period during which the product was sold, or as to what sales would normally be expected in the market, *Ex Parte Standish*, 10 USPQ2d 1454 (Bd. Pat. App. & Inter. 1988)."

a. The '301 Patent has a Significant Market Share Percentage in the "Molded Gel Memory Foam PCM pillows with punched holes" Market Category

Patent Owner produces and markets GhostPillow by Nature's Sleep. (Exhibit 2011, GhostPillow). A picture of Patent Owner's GhostPillow created using the '301 Patent process is shown below. For clarity, the green/turquoise color is the "solid, resilient, compressible foam block", the blue color is the "phase change material" on the surface of the foam block, and holes are cut in the foam block with PCM.

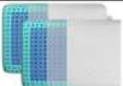


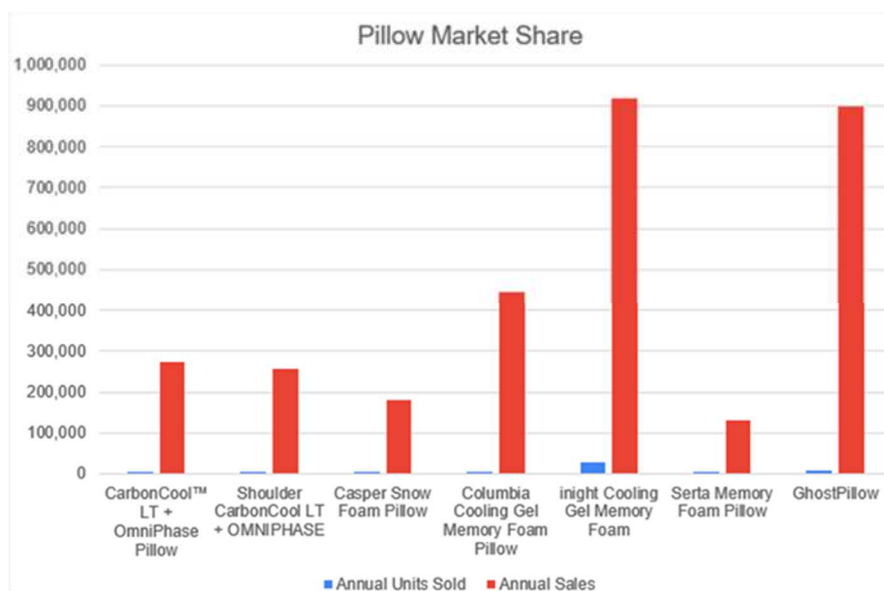
To determine the relevant market share regarding the process to create cooling pillows, data was harvested directly from Amazon with a credible third-party software program called “Jungle Scout” that provides real-time and historical analysis of top-line sales, units, profitability, and first listing timeline. (Exhibit 2013, Quinn Decl., ¶ 25).

A comparison chart shown below illustrates the market penetration of the competing products and brands with the Patent Owner’s product, which can be categorized as a Molded Gel Memory Foam PCM pillow with punched holes. It should be noted that the Patent Owner’s product is based on the process claimed in the ‘301 Patent. (Exhibit 2013, Quinn Decl., ¶¶ 28-34).

Competing Brands

Product Name	CarbonCool™ LT + OmniPhase Pillow	Shoulder CarbonCool LT + OMNIPHASE	Casper Snow Foam Pillow	Columbia Cooling Gel Memory Foam Pillow
Image				
Brand Name	Malouf	Malouf	Casper	Columbia
Reviews	281	281	131	1,917
Retail Price	\$141.68	\$136.54	\$112.50	\$139.99
Monthly Units Sold	160	156	134	265
Annual Units Sold	1,920	1,872	1,608	3,180
Annual Sales	\$272,025.60	\$255,602.88	\$180,900.00	\$445,168.20

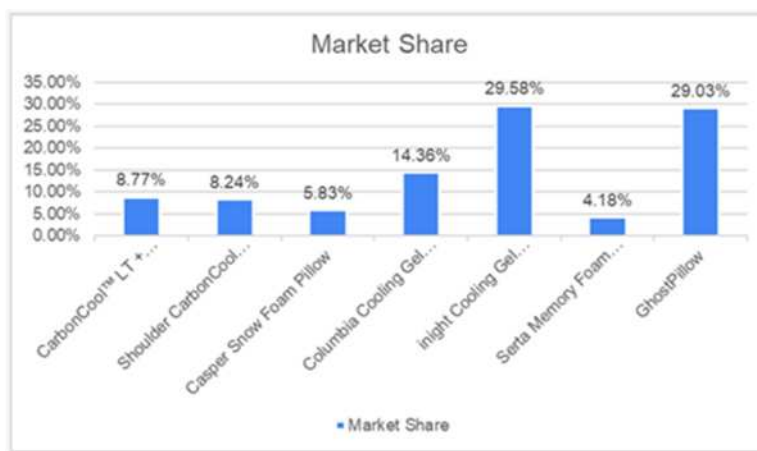
Product Name	inight Cooling Gel Memory Foam	Serta Memory Foam Pillow	GhostPillow
Image			
Brand Name	inight	Serta	GhostPillow
Reviews	4,023	305	1,521
Retail Price	\$33.96	\$50.48	\$129.99
Monthly Units Sold	2,251	214	577
Annual Units Sold	27,012	2,568	6,924
Annual Sales	\$917,327.52	\$129,632.64	\$900,050.76



Shown in the figures above, the total annual average sales for the peer group are \$366,776.14 compared to the Patent Owner's product at \$900,050.76. The total revenue for all competing brands represents \$3,100,707. The Patent Owner's

GhostPillow produced using the ‘301 Patent process, which can be categorized as a Molded Gel Memory Foam PCM pillow with punched holes, had annual sales of \$900,050, which represents a 29.03% market share. A 29.03% market share illustrates a significant percentage in the Molded Gel Memory Foam PCM pillow with punched holes category by the Patent Owner’s product.

The market share of the competing brands is shown below to illustrate that the Patent Owner’s product based on the ‘301 Patent is a significant percentage compared to competing brands. (Exhibit 2013, Quinn Decl., ¶¶ 33, 34).



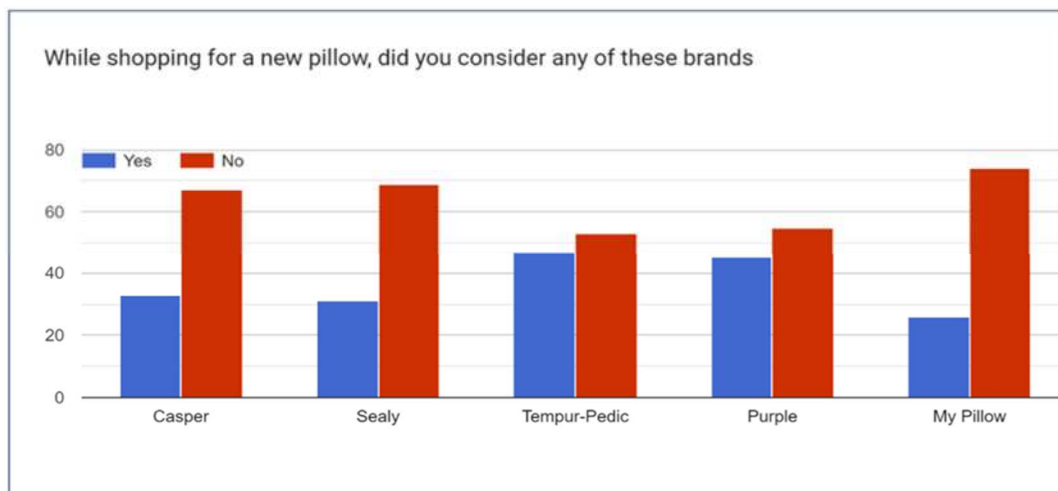
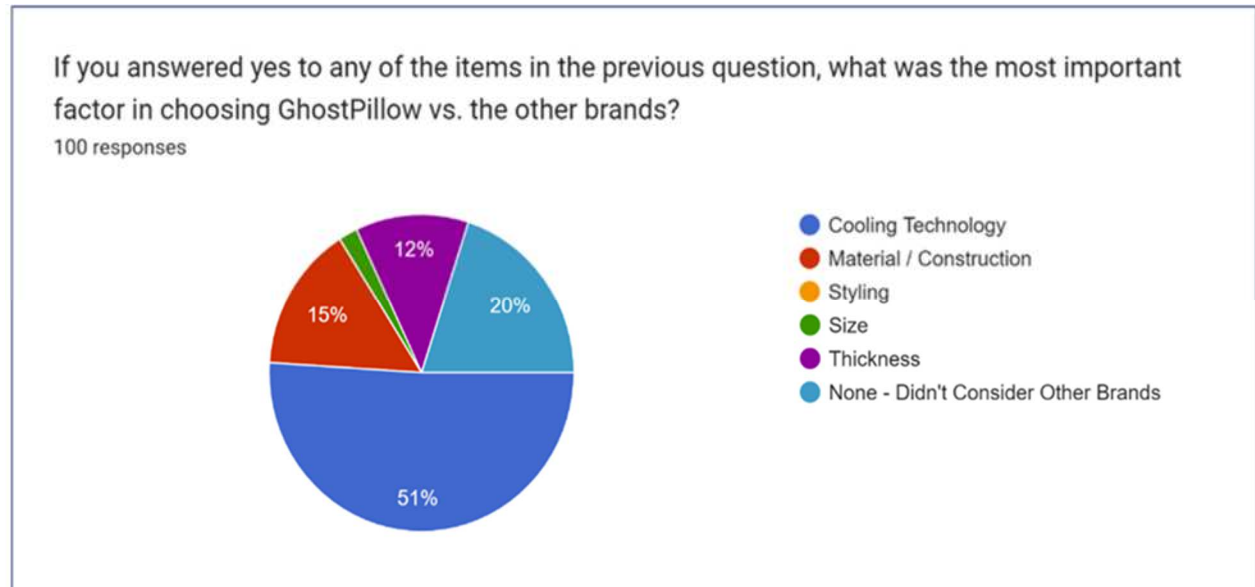
Based on the market share analysis discussed above, commercial success is evident here because there is objective evidence that the Patent Owner’s product has a significant market share in the Molded Gel Memory Foam PCM pillow with punched holes category.

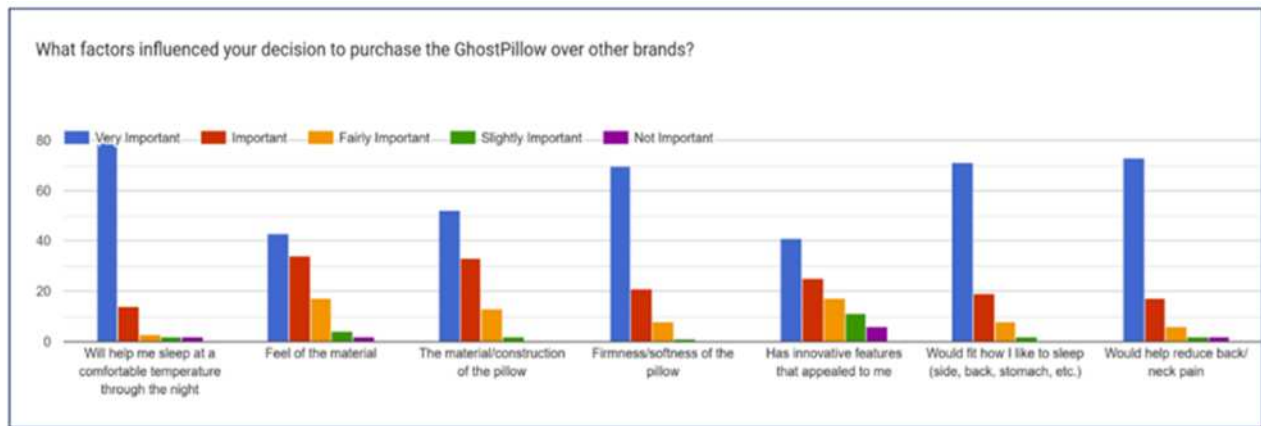
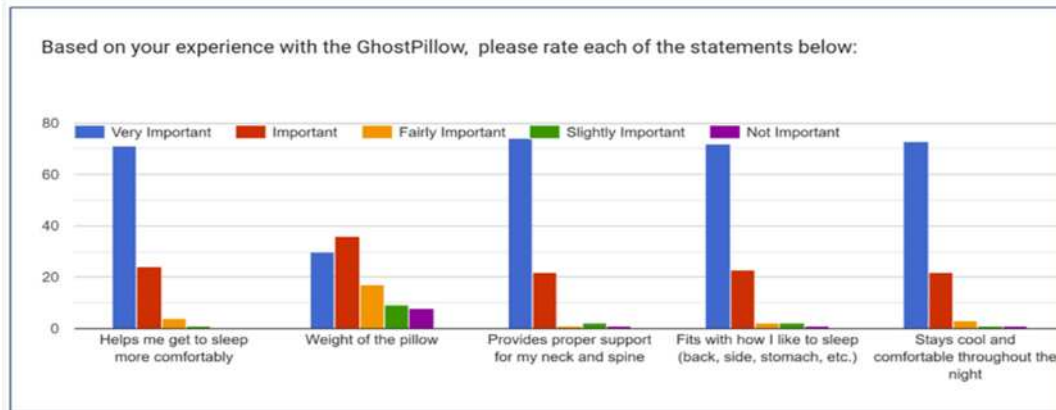
b. There is Objective Evidence of Commercial Success Based on the Customer Survey and Test Results that Show a Nexus Between the Claims of the '301 Patent and Why Consumers are Buying the Patent Owner's Product

As stated above, a nexus between the sales and the claimed invention must be objectively demonstrated to also show commercial success. To objectively demonstrate the nexus between the sales and the claimed invention, a survey was sent through third-party site Google Forms to 4,000 previous GhostPillow customers to poll the specific features or product specifications that influenced the customers to purchase Patent Owner's product. (Exhibit 2013, Quinn Decl., ¶ 36; Exhibit 2015, p. 12; Exhibit 2016). The survey resulted in 100 responses, or a 2.5% response rate. (Exhibit 2013, Quinn Decl., ¶ 37). A Likert Scale was used to determine how important certain features, materials, and other factors were to the customers when making a purchasing decision about pillows. (Exhibit 2013, Quinn Decl., ¶ 38). The results from the consumer research demonstrate the importance of the cooling features of the product created from the process of the '301 Patent for consumers in making a purchasing decision. (Exhibit 2013, Quinn Decl., ¶ 39; Exhibit 2015).

Every nonleading question that was asked regarding the features and benefits of the Patent Owner's product resulted in the cooling features claimed in the '301 Patent ranked at or near the top of the list. In addition, when asked what the most important factor was in making a purchasing decision compared to other brands, the

cooling feature claimed and created by the process in the '301 Patent was selected by 51% of the respondents. (Exhibit 2013, Quinn Decl., ¶ 45; Exhibit 2015).





The survey analysis and the graphical representations, shown above, objectively demonstrate that consumers purchase the Patent Owner's product

created by the process in the '301 Patent because of the cooling feature created by Patent Owner's patented process. (Exhibit 2013, Quinn Decl., ¶ 46).

In addition, three tests on two samples were conducted by a third-party company Element to measure the actual cooling effects of the Patent Owner's product. One sample was solid foam, and the other sample was solid foam with PCM applied to the surface of the foam with punched holes. (Exhibit 2017, Elements Test; Exhibit 2013, Quinn Decl., ¶ 49). The results of the testing independently quantify the significance of the cooling features achieved by the process claimed in the '301 Patent (Exhibit 2017, Elements Test; Exhibit 2013, Quinn Decl., ¶ 47).

A POSITA can infer that the testing results show the properties of the Patent Owner's product significantly outperform those of a standard solid piece of foam related to regulating surface temperatures. (Exhibit 2013, Quinn Decl., ¶ 83; Exhibit 2017, Elements Test). Further, the Q-MAX value, which is an indication of a material to transfer heat from a hotter body to a colder body, was measured to be significantly higher for the Patent Owner's product compared to the same foam block without holes or PCM. (Exhibit 2013, Quinn Decl., ¶¶ 81, 82; Exhibit 2017, Elements Test). This demonstrates Patent Owner's product, created using the process from the '301 Patent, cools at a higher level of magnitude compared to a standard solid foam block. (Exhibit 2013, Quinn Decl., ¶¶ 82, 83). The measured

Q-MAX score for solid foam and the punched PCM foam is shown below. (Exhibit 2013, Quinn Decl., ¶ 81; Exhibit 2017, Elements Test).

Test	Solid Foam	Punched Foam	Diff #	Diff %
QMAX	158.7	303.1	144.4	90.99%

Based on the survey analysis and the testing results discussed above, there is a nexus between why customers are buying the Patent Owner's product and the cooling features claimed in the '301 Patent. Therefore, based on the analysis discussed, it has been shown that the claimed features of the '301 Patent were responsible for the commercial success of the Patent Owner's product. *See In re Huang*, 100 F.3d 135, 40 USPQ2d 1685 (Fed. Cir. 1996). The Patent Owner has objectively shown evidence of non-obviousness because the Patent Owner has demonstrated that the claimed features in the '301 Patent were responsible for the commercial success of Patent Owner's product. (Exhibit 2013, Quinn Decl., ¶¶ 87, 88; Exhibit 2017, Elements Test).

1. There is Objective Evidence that Competing Brands Copied the Process of the '301 Patent to Create Similar Cooling Pillows

The Patent Owner's GhostPillow has been widely copied throughout the industry. The Federal Circuit has held, since *Eli Lilly*, that all evidence of secondary considerations must be considered as part of the obviousness analysis, and that secondary considerations cannot be disregarded. See, e.g., *In re Cyclobenzaprine*

Hydrochloride Extended-Release Capsule Patent Litig., 676 F.3d 1063, 1078-1079 (Fed. Cir. 2012). Copying by others weighs in favor of non-obviousness. *Merck Sharp & Dohme Corp. v. Sandoz Inc.*, No. 3:12-cv-03289, 2015 BL 277644 (D.N.J. Aug. 27, 2015) (Sheridan, J.).

Data was harvested from Amazon using Jungle Scout, as objective evidence, to show when similar cooling pillow products were first listed on Amazon. (Exhibit 2013, Quinn Decl., ¶ 89). This analysis allows for the creation of a first listing timeline. This timeline shows that the Patent Owner's product (the cooling pillow), categorized as a Molded Gel Memory Foam PCM pillow with punched holes, was first disclosed prior to competing brands with similar products entering the market. A POSITA can objectively infer from this data that the other competing brands, which came after, likely copied or imitated the process disclosed in the '301 Patent to create a similar product in the Molded Gel Memory Foam PCM pillow with punched holes category. (Exhibit 2013, Quinn Decl., ¶ 91; Exhibit 2015).

A POSITA can also infer from the timeline shown below, in conjunction with the test results, that competing brands likely copied the cooling pillow because the Patent Owner's product functions at a high level as evidenced by the extremely high Q-MAX metric. (Exhibit 2013, Quinn Decl., ¶ 92; Exhibit 2015).

Competing Brands Market Entrance

Timeline



The analysis and timeline above rebut a presumption of obviousness due to the objective analysis showing copying or imitation by others competing brands with similar products. Given the lead time to introduce new products into the market, a POSITA can objectively infer that competitors either saw the disclosure of the ‘301 Patent or products covered by the process protected by the ‘301 Patent, and then initiated their own plans to offer similar cooling products using the steps covered by the ‘301 Patent. (Exhibit 2013, Quinn Decl., ¶¶ 91, 92; Exhibit 2015). The timeline as well as the test results rebut a presumption of obviousness due to the objective analysis showing copying or imitation by others.

2. There is Objective Evidence of Non-Obviousness Due to the Length of Intervening Time Between Products

As stated in *Ex Parte* Whirlpool Corporation, decision of the Patent Trial and Appeal Board, U.S. Reexamination Request Control No. 90/009,855, “[t]he length of the intervening time between the publication dates of the prior art and the claimed invention can also qualify as an objective indicator of non-obviousness.” (Exhibit 2012, *Ex Parte* Whirlpool, p. 17). Lievestro and Ohta were published over a decade before the ‘301 Patent’s priority date. Crawford was published three years before the ‘301 Patent and Schneider one year.

Moreover, from the timeline shown above, a POSITA can infer that competing brands entered the market with similar cooling pillows, at the earliest, one year after Patent Owner’s priority date. (Exhibit 2013, Quinn Decl., ¶¶ 92, 93; Exhibit 2015). A POSITA can infer that the said timeline demonstrates that intervening times between the competing products and the ‘301 Patent is an indicator of non-obviousness. *Leo Pharma., Ltd. v. Rea*, 726 F.3d 1346 (Fed. Cir. 2013). If the ‘301 Patent was “obvious”, why did it take major competing brands at least a year to produce and market their own competing products when the prior art was publicly available for over a decade? Here, as indicated by the timeline shown above, it took competing brands at least one year to create and bring to market similar products.

This length of time between the Patent Owner's process disclosed in the '301 Patent, and the competing brands with similar products, qualifies as an objective indicator of non-obviousness.

3. The Test Results Show an Unexpected Result of an Extremely High Q-MAX Value, Which is at Least Twice as High as the Industry Standard for Q-MAX

Secondary considerations may be presented as evidence of non-obviousness. In particular, secondary considerations may include unexpected results. *Graham v. John Deere Co.*, 383 U.S. 1 (1966). Applicants must show that differences in properties between the claimed invention and the cited prior art differ to such an extent that the difference is really unexpected. MPEP § 716.02. The showing of unexpected results must be based on evidence, not argument or speculation. MPEP § 2145.

Testing by third party company Element was conducted to measure the actual cooling effects of the Patent Owner's product. (Exhibit 2013, Quinn Decl., ¶ 47; Exhibit 2017). The results of the testing further prove the significance of the cooling features claimed by the process disclosed in the '301 Patent compared to the asserted prior art. (Exhibit 2013, Quinn Decl., ¶¶ 87, 88). The testing result indicated an unexpectedly high value for the Q-MAX score. (Exhibit 2013, Quinn Decl., ¶ 94; Exhibit 2017).

As can be seen by the table included herein, an increase Q-MAX number of 90% was achieved between the two samples (Exhibit 2013, Quinn Decl., ¶ 81; Exhibit 2017). This magnitude of increase in the Q-MAX number was not expected when the ‘301 Patent was filed nor was it expected when the product was manufactured. Mr. Quinn would have estimated the Q-Max to improve by roughly 20-30% before testing was performed. (Exhibit 2013, Quinn Decl., ¶ 97). The independent testing showed an increase of 90% Q-Max due to the addition of the PCM and holes to the foam block. (Exhibit 2013, Quinn Decl., ¶ 97). The difference in Q-MAX number between the Patent Owner’s product based on the ‘301 Patent and the cited prior art differ to such an extent that the difference is unexpected. See MPEP § 716.02. The showing of unexpected results is based on evidence obtained through independent testing. (Exhibit 2013, Quinn Decl., ¶¶ 81, 87, 94, 97; Exhibit 2017). The secondary considerations of unexpected results presented here is further evidence of non-obviousness as it pertains to the ‘301 Patent.

VIII. CONCLUSION

Claims 1 and 2 of the ‘301 Patent are valid, enforceable process claims. The prior art asserted by Petitioner teach away from the process of the ‘301 Patent (i.e., the reticulated foam of Schneider) or, if combined, result in an ineffective product created by the process of the ‘301 Patent. Test data, unexpected results, market studies, and copying by others demonstrate the ingenuity of the process of the ‘301

Patent to create a cooling effect to the user in a cooling pillow. Patent Owner respectfully requests this Board deny the Petition and hold Claims 1 and 2 of the '301 Patent valid.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Patent Owner hereby certifies with reliance on the word count provided by the word-processing system used to prepare this Response to IPR Petition, that the number of words in this paper is 11,804. This word count excludes the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, certificate of word count, and claim listing.

Date: August 23, 2024

/Greg M. Popowitz/
Greg M. Popowitz

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.205, service was made on Petitioner as detailed below.

<i>Date of Service</i>	August 23, 2024
<i>Manner of Service</i>	P-TACTS, E-Mail, and FedEx (mailing by August 26, 2024)
<i>Documents Served</i>	- This Response to IPR Petition - Exhibits 2001-2008 and 2010-2017
<i>Persons Served</i>	Mark I. Koffsky mkoffsky@koffskyschwalb.com Gary Serbin gserbin@koffskyschwalb.com Koffsky Schwalb LLC 500 7th Ave, 8th Floor New York, NY 10018

Date: August 23, 2024

/Greg M. Popowitz/
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