

Filed on behalf of Converter Manufacturing, LLC

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IPR2024-01435

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NINGBO LINHUA PLASTIC CO., LTD.,
Petitioner

v.

CONVERTER MANUFACTURING, LLC
Patent Owner

Case No. IPR2024-01435
U.S. Patent No. 10,562,222

PATENT OWNER PRELIMINARY RESPONSE

PATENT OWNER’S EXHIBIT LIST

EXHIBIT	DESCRIPTION
2001	Patent Owner’s Rule 1.321(a) Disclaimer
2002	U.S. Patent No. 3,096,546 to Bryant
2003	Exhibit 1055 from IPR2021-00916, -00918, -00919
2004	Excerpts of Exhibit 1044 from IPR2021-00916, -00918, -00919
2005	<i>Clearly Clean Products, LLC et al. v. Ningbo Linhua Plastic Co., Ltd.</i> – 5:20-cv-01054 JAK(GJS) – S.P.R.B.1(e) Claim Charts U.S. Patent No. 10,562,222 (the “222 Patent”)
2006	February 26, 2018 Email between Pieter-Jans Willemse and Tim McKeever with attachment
2007	March 5, 2018 Email chain between Pieter-Jans Willemse and Tim McKeever with attachments
2008	Excerpts of July 1, 1978 Title 37 of Code of Federal Regulations
2009	Declaration of Millard Wallace from IPR2021-00916, -00918, -00919 regarding February 26, 2018 and March 5, 2018 Emails between and among Pieter-Jans Willemse and Tim McKeever.

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Pursuant to 37 C.F.R. § 42.107, Converter Manufacturing, LLC (“CM”) submits this Patent Owner Preliminary Response to the Petition for *Inter Partes* Review (the “Petition”) filed by Ningbo Linhua Plastic Co., Ltd (“Ningbo” or “Petitioner”) regarding claims 1-21 of U.S. Patent No. 10,562,222 (the “’222 Patent”). The Board should not institute a trial pursuant to any Ground made in the Petition for the reasons that follow.

I. INTRODUCTION

Pursuant to its contemporaneously filed disclaimer of Claims 1-4 and 11-20 under 37 CFR § 1.321(a) (Ex. 2001), CM has limited the challenged claims to Claims 6-10 and 21, which require *inter alia* a method of forming a smooth periphery all around a thermoformed thermoplastic article by rolling the sharp thermoplastic edge at the periphery of a thermoformed article inwardly and out of the way of any overwrapping films or fingers of users. No prior petitions for *inter partes* review have involved a challenge to CM’s method claims. Instead, all other petitions focused exclusively on thermoformed articles having smooth peripheries. Indeed, the USPTO recognized the distinction between the innovative methods that are the subjects of CM’s ‘222 Patent claims and the disclosed product, which “can be made by another and materially different process...” Ex. 1002 at 201. The patentability of these duly issued method claims has not been addressed by any Court or administrative agency before now.

The Petition relies on two references: (1) WO96/011769 to Portelli et al. (“Portelli”) as to claims 6-10 and 21; and (2) U.S. Patent No. 4,228,121 to Meadors (“Meadors”) as to claims 6 and 21. Portelli’s methods do not operate on thermoplastic articles having the shape recited in CM’s challenged claims nor do they create a smooth periphery all about the thermoformed thermoplastic article to which they are applied. Furthermore, Portelli (WO96/01179) was already cited during prosecution of the ‘222 Patent (Cite No. 2 in the September 4, 2019 Information Disclosure Statement of CM; *see also* Ex. 1001 (‘222 Patent) at page 2) and the challenged claims were allowed over Portelli. *See* Ex. 1002 at 450-463.

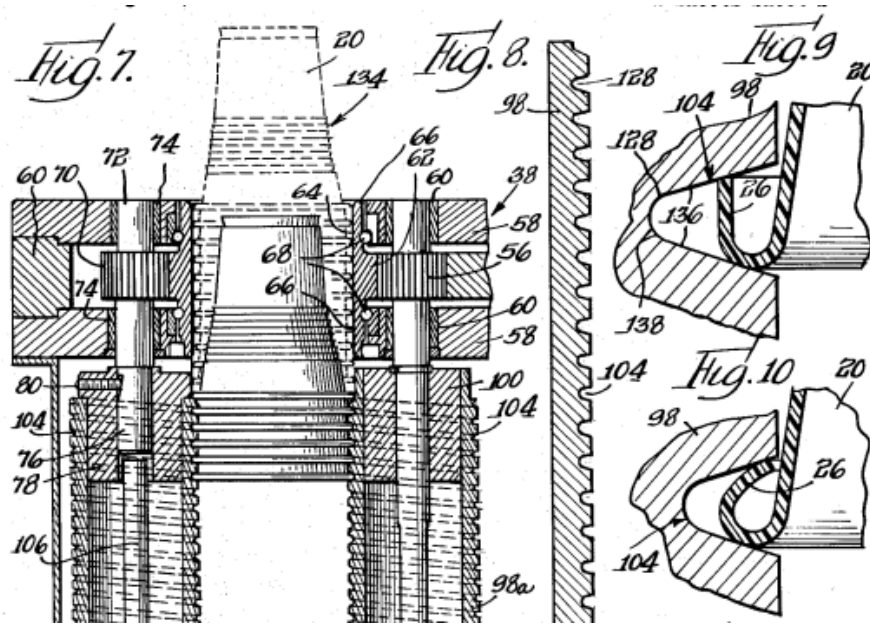
Meadors’ methods are disclosed only as they operate on paper and are not operable on thermoplastic, even though the challenged claimed methods require operations on a thermoplastic. Indeed, Meadors does not disclose what its disclosed apparatus would do if it were to operate on a thermoplastic or how Meadors’ disclosed methods could or might be modified to operate on thermoplastic, leaving the person of ordinary skill in the art (“POSITA”) to have to speculate and unduly experiment. Additionally, Meadors’ methods are not disclosed as operable or as operating upon thermoplastic articles having the shape recited in the challenged claims, and to the extent that an analog to the recited shape can be considered present in the workpiece used in Meadors, it can be seen that Meadors’ disclosed methods operate in a fashion opposite the method recited

in the challenged claims, namely, they deflect the nearest analog of the claimed “spacer” feature of the paperboard article outwardly (relative to the nearest analog of the claimed “extension” feature) and thereby increase the angle therebetween the “spacer” and the “extension,” contrary to the method recited in the challenged claims.

II. THE PROBLEM FOR THE THERMOFORMING INDUSTRY THAT WAS SOLVED FIRST BY CM AND THE CHALLENGED CLAIMS

Thermoformed articles are made by softening and forming a flat sheet of thermoplastic into an article having a selected shape. When the shaped article is cut from the thermoplastic sheet, the article’s peripheral edge will be sharp and will cut flexible plastic overwrap films commonly used to wrap the article and its contents. The sharp edge can also injure the hands and fingers of people tasked with handling the article. Prior to the CM’s invention this sharp edge prevented the use of thermoformed shaped articles in many applications, including use as wrapped food trays.

Prior to the ‘222 Patent, skilled artisans had used spiral dies to “spin” circular articles (e.g., drinking cups or plastic dinner plates) through articulated rim-rolling tools to smoothen their peripheral edges:



See Ex. 2002 (U.S. Patent No. 3,096,546), 4:19-43.

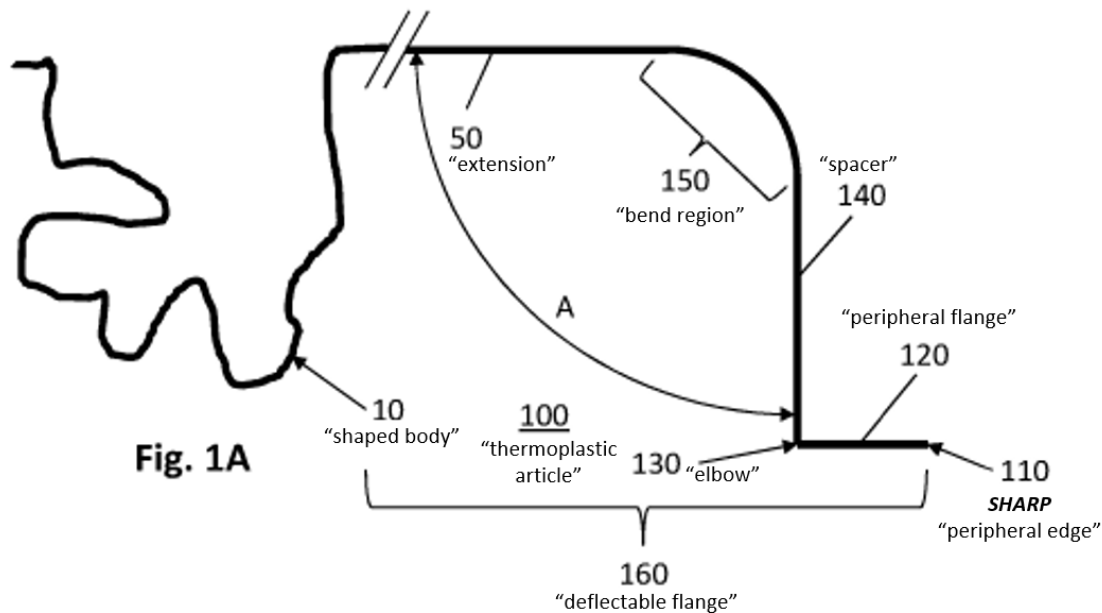
However, this method did not work on non-circular articles and required timing screws and an articulated rim-rolling tool to accomplish its objective. See Ex. 1001 at 4:7-19.¹ The ability to use a ram or die/mold tool to roll the rim of a thermoformed article was a problem that thermoforming manufacturers, like DexterMT, “thought to be unsolvable” as late as 2016, which is *after* the earliest effective priority date of the ‘222 Patent claims (August 31, 2015):

¹ Citations to patents follow the convention “[column]:[line(s)]” while citations to printed publications follow the convention “[page]:[line(s)]”.



Ex. 2003 at 5 (“Our very latest innovation solves a problem that was thought to be unsolvable. Rim Rolling in Mould produces a rolled rim on a cup in one step. Also the RRIM technology allows new shapes like triangular or square to be rim-rolled, which has been impossible until now!”) According to the Declaration of Glenn May in IPR2021-00196, -00198, and -00199, the image above and found in CM’s Ex. 2003 (Ex. 1055 in IPR2021-00196, -00198, and -00199) was provided by DexterMT to those who visited the DexterMT booth at the 2016 K-Show in Germany. See Ex. 2004 at ¶¶ 42-43. Glenn May is the same Glenn May providing expert testimony to which the instant Petition cites for Grounds 1 and 2.

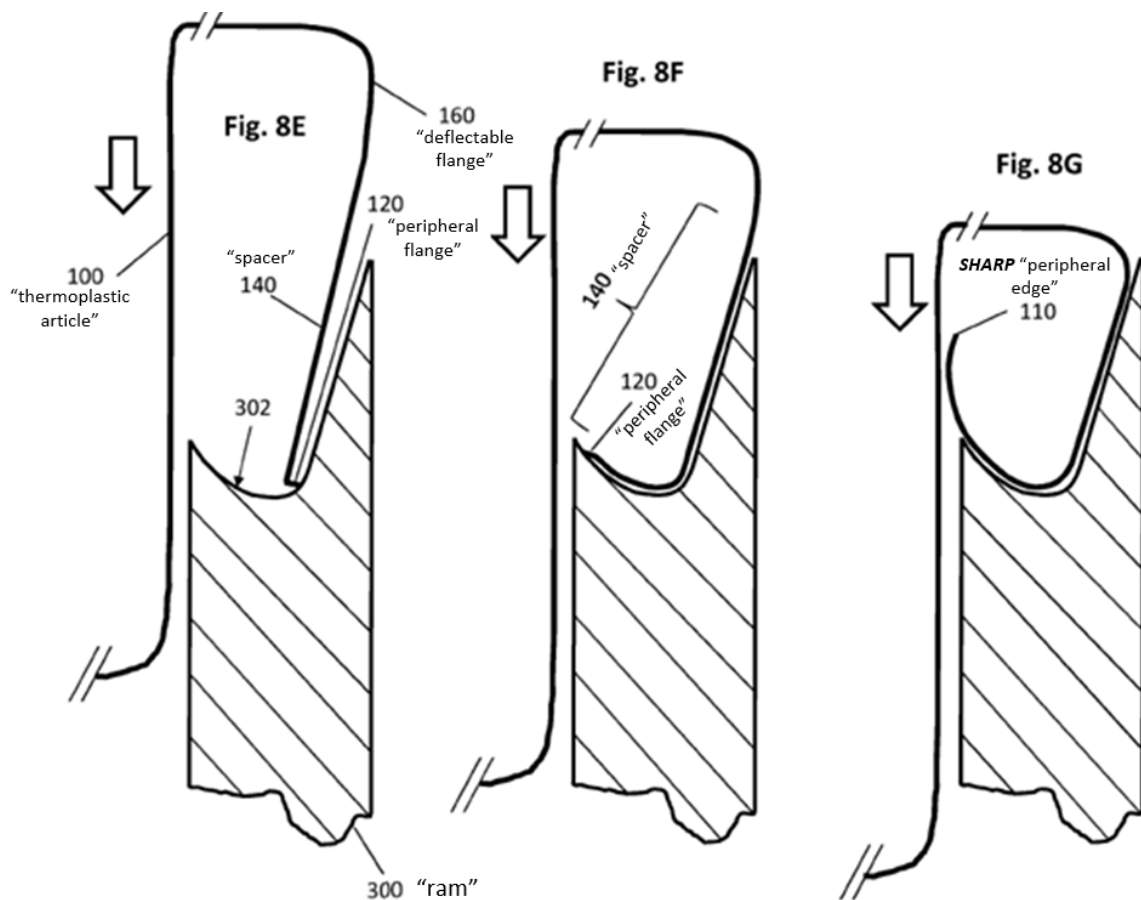
Despite other thermoforming manufacturers failing to enable a method to obtain the desired rolled edge on a thermoformed article, CM pioneered, disclosed, and claimed a method for creating a smooth periphery all about a thermoformed article as recited in claims 6-10 and 21 of the '222 Patent. CM's novel edge-smoothing method involves taking a formed thermoplastic article cut from a plastic sheet and having the industry standard sharp peripheral edge all about its periphery:



'222 Patent, Fig. 1A (annotations supplied). The methods recited in the '222 Patent claims require a formed thermoplastic article having a deflectable flange in which the peripheral flange and spacer are connected by an elbow at an angle other than 180 degrees. This will be referred to as a "pre-impingement article," because

the deflectable flange of this article (item 160 in Fig. 1A above) will be the one subjected to the ram-based methods of the '222 Patent claims.

According to CM's inventive method, the deflectable flange (item 160) of the pre-impingement article is impinged by a ram (item 300 below) so that it will decrease the angle (angle "A" in Fig. 1A above) between the spacer and the extension by forming the spacer into a bent portion (that is, the spacer is deflected inwardly toward the extension at the angle A):



'222 Patent, Figs. 8E-G (annotations supplied).

As a result of CM's claimed methods, the sharp peripheral edge at the periphery of the thermoformed article will be rolled inwardly and away from the periphery around the entire periphery of the article.

To appreciate the complexity of the problem solved by CM's '222 Patent claims, the reader can take a sheet of standard legal paper and attempt to roll each of its four sharp edges inwardly simultaneously without forming any sharp points, wrinkles, folds, or puckers (especially in the corners). Alternatively, the reader could take the same paper rolled and taped to itself as a tube (or used a pre-formed tube, such as those which carry toilet tissue or paper towels) and attempt the same exercise without forming sharp points or puckers. These simple examples help illustrate the complexity of the problem that was presented to the thermoforming industry for decades and the innovation of CM to have been able to solve that problem.

III. THE DEFICIENCIES IN PETITIONER'S OBVIOUSNESS CHALLENGES BASED ON PORTELLI (GROUND 1)

Although the Petition characterizes Ground 1 as one based on obviousness, the Petition is entirely bereft of any analysis of the Graham factors using any of the exemplary rationales for obviousness in M.P.E.P. § 2141(III) (Rev. 1, 2024). Petition refers to the word "obvious" two times throughout the entire Ground 1 (Pet. at 18, 40) and only then to quote the word as used in Portelli's text. Critically, neither Petitioner nor the expert whose opinions it cites considered the

objective indicia of non-obviousness based on CM's licensee's practice of the '222 Patent methods to create its own commercially successful articles despite Petitioner's and the expert's access to that information. *See* Ex. 2005 (*Clearly Clean Products, LLC et al. v. Ningbo Linhua Plastic Co., Ltd.* – 5:20-cv-01054 JAK(GJS) – S.P.R.B.1(e) Claim Charts U.S. Patent No. 10,562,222 (the "'222 Patent'")).

Therefore, for these and the reasons that follow, the Board should not institute a trial on Ground 1 because Petitioner does not even facially maintain a *prima facie* case of obviousness based on Portelli that involves an analysis of all four Graham factors.

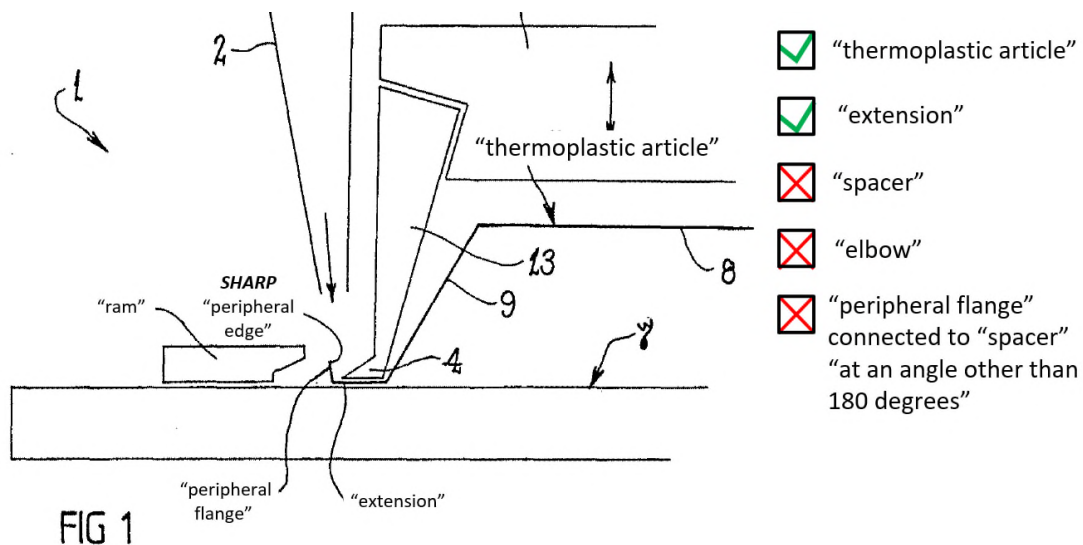
A. PORTELLI FAILS TO DISCLOSE THE CLAIMED PRE-IMPINGEMENT ARTICLE OF CLAIMS 6 AND 21

1. Portelli's Figures 1-4 and 9-11 Do Not Show a Pre-Impingement Article Used According to the Claimed Methods

The '222 Patent claims require (i) a ram to impinge upon the peripheral flange of a thermoformed article bearing a sharp peripheral edge *and* (ii) that the peripheral flange, in its pre-impingement position, is connected to a spacer by an elbow at an angle other than 180 degrees. Portelli's Figures 1 and 3 are described as "schematic sectional front elevations of an apparatus for performing the invention ... *prior to the deforming operation taking place[.]*" Ex. 1004 at 7:13-

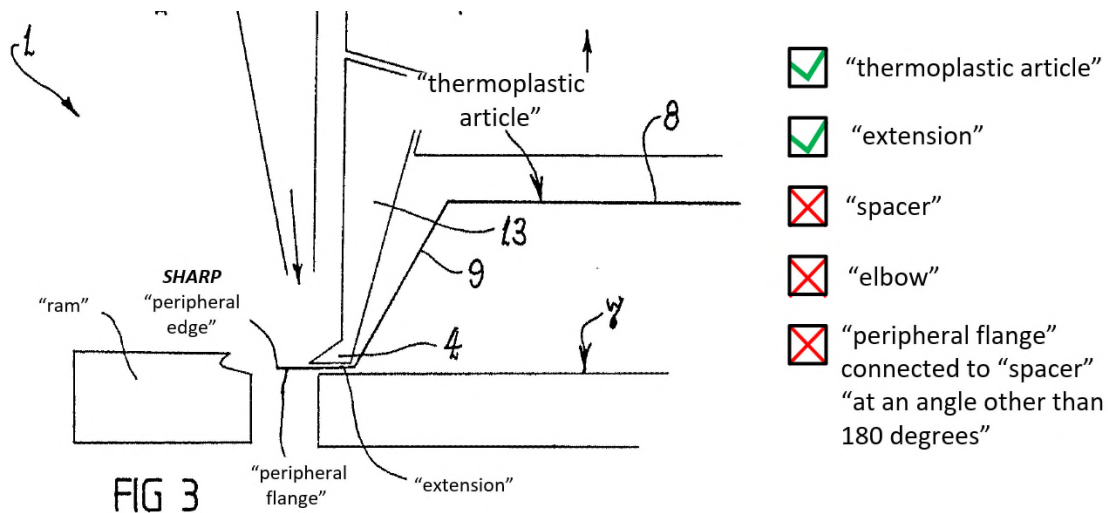
15, 18-20.² Therefore, a POSITA would understand Portelli's Figures 1 and 3 to be Portelli's proposed pre-impingement thermoformed articles to be used according to its methods.

In contrast to the challenged claims, Portelli's Figures 1 and 3 clearly show that the article on which the proposed Portelli method operates lacks the claimed "spacer," "elbow," and "peripheral flange" that is connected to a spacer "at an angle other than 180 degrees" as illustrated and annotated below:



Portelli, Fig. 1 (annotations supplied).

² All emphasis added unless otherwise indicated.

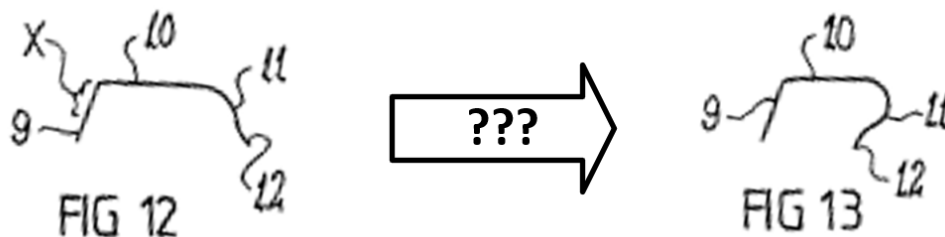


Portelli, Fig. 3 (annotations supplied).

For at least the above reasons, the methods depicted in Portelli Figures 1-4 and 9-11 cannot be considered to disclose the methods recited in challenged claims 6-10. For those same reasons, Portelli's Figure 1-4 and 9-11 methods cannot be considered to show or suggest similar limitations in Claim 21.

2. Portelli's Figures 12-13 Do Not Show a Pre-Impingement Article Used According to the Claimed Methods.

In its Figure 12, Portelli illustrates a line drawing of a cross-section of one edge of a thermoformed article, the cross-section having a sharp peripheral edge, but unlike what was illustrated in Portelli's Figures 1-4 and 7-11, Portelli does not illustrate or otherwise teach the process the persons of ordinary skill in the art ("POSITA") must use to convert the cross-section of Figure 12 into the hypothetical cross-section depicted in the line drawing in its Figure 13:



There is no disclosure whatsoever of the tools or methods that a POSITA might use to render a Figure 13 thermoformed article profile on a thermoformed article having the edge illustrated in Figure 12. Moreover, Portelli discloses no method by which such a change might affect the entire periphery of an article without folding, wrinkling, bending, or pointing, or even if it might be achieved at all.

Although Portelli discloses the advantages of a thermoformed article having edges with the cross-section of Figure 13 and the same may be inherent from the illustration itself, that fact does not suggest the obviousness of CM’s claimed methods without any disclosure of the steps or tools needed to achieve that result. *See In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993) (“Obviousness cannot be predicated on what is not known at the relevant time, even if the inherency of a certain feature is later established.”); *Application of Spormann*, 363 F.2d 444, 448 (C.C.P.A. 1966) (“inherency of an advantage and its obviousness are entirely different questions.”) M.P.E.P. § 2141.02 (Rev. 1, 2024). Indeed, although the Petition asserts that Portelli shows “in Figure 13 the effect of impinging a ram against the peripheral flange to deflect the spacer towards the extension,” Pet. at 34

(citing Ex. 1003, ¶107), the evidence of that assertion is the unsupported opinion of the expert cited by Petitioner, Mr. May, which never identifies where Portelli discloses a ram that yields the cross-section illustrated in Figure 13 from the cross-section illustrated in Figure 12 (either at a single position or completely about the periphery). Factually unsupported opinion testimony “is entitled to little or no weight.” 37 C.F.R. §42.65(a). “Mr. May provides insufficient support in the record for this testimony....” Sealed Air Corp. v. Ranpak Corp., IPR2020-01249, 2022 WL 129094, at *9 (P.T.A.B. Jan. 12, 2022).

Compounding the above technical defects, Petitioner failed to demonstrate that Portelli Figure 12 shows the “pre-impingement” version of the peripheral flange, and instead relied on an article having the profile of Portelli’s Figure 13 to show the *pre-impingement* limitations of the challenged claims. *See* Pet. 19-22, 26, 29-30, 36-37, 88-90 (Claim 1[B]-[D],1[F]; Claim 21[Pre], [A]-[i]). First, even if Figure 13 was misunderstood by Petitioner to be the pre-impingement edge of the Portelli article, Portelli fails to disclose any subsequent version of its Figure 13 *after* it is impinged by any hypothetical ram or that such subsequent impingement meets any of the impinging limitations of the challenged claims.

Second, Portelli expressly discloses, “Fig 13 is a schematic sectional view of the edge of the tray of Fig. 12 *after it has been deformed* out of the wrap path in accordance with the invention.” Ex. 1004 at 8:11-3. Portelli does not teach the

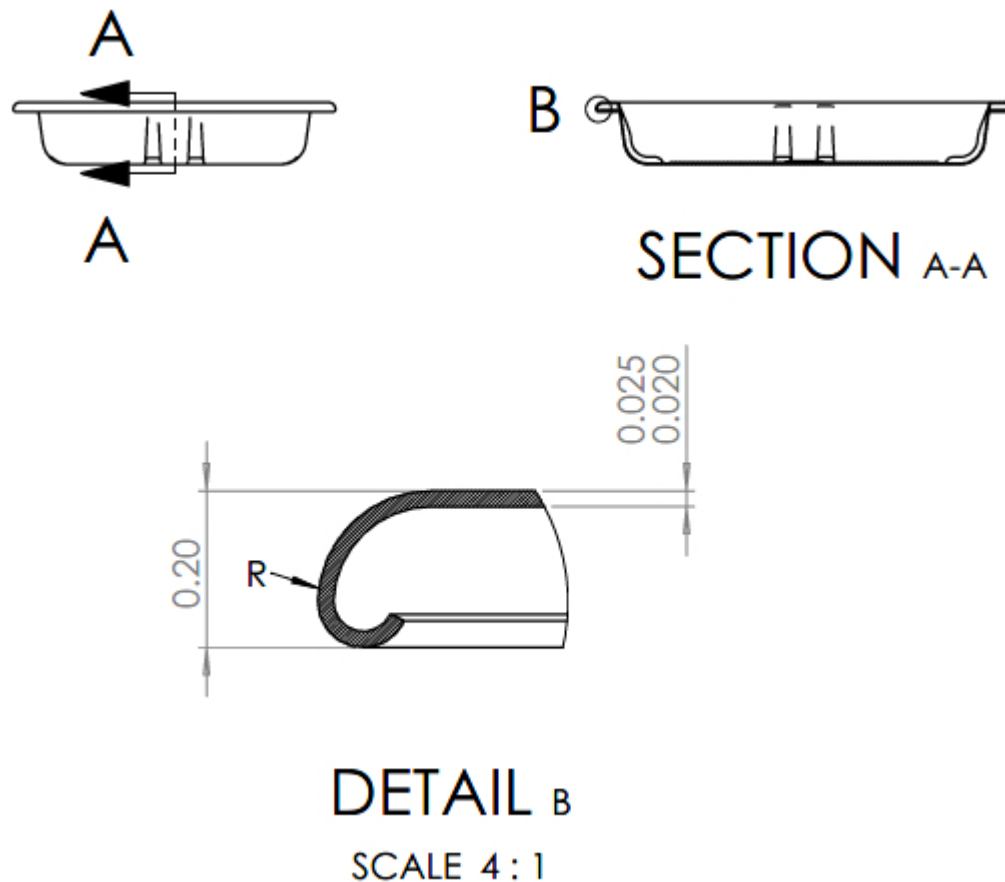
POSITA to use the die 25 in Figures 7 and 8 to deform the profile of Figure 13 because Figure 13 represents the tray edge “after it has been deformed.” Again, neither Petition nor the expert it cites explains how or why a POSITA would be motivated to apply to a tray having the already-deformed profile disclosed in Portelli’s Figure 13 against a die, such as that shown in Portelli’s Figures 7 and 8, to further-deform the already-deformed edge; this is something never disclosed in the reference. *See* Pet. at 77-78 (citing Ex. 1003, ¶¶206-207). At bottom, Petitioner’s obviousness challenge directly contradicts the Portelli reference; the reviewing court requires this tribunal to disregard such contradictory arguments. *See* Homeland Housewares, LLC v. Whirlpool Corp., 865 F.3d 1372, 1378-79 (Fed. Cir. 2017) (disregard expert testimony that “is plainly inconsistent with the record.”) Furthermore, to the extent Petitioner wishes to modify Portelli to use what its inventor desired in a finished article (a tray having the edge cross-section shown in Portelli Fig. 13) as though it was unfinished and in need of further impingement (despite Portelli’s teaching to the contrary), then Petitioner’s proposed modification would both (a) be redundant and unnecessary; and (b) “change the principle of operation of the prior art invention being modified, [which is] not sufficient to render the claims *prima facie* obvious.” *See* M.P.E.P. §2143.01(VI) (“The Proposed Modification Cannot Change the Principle of Operation of a Reference”).

The Petition refers to a self-serving illustration by the expert speculating about what might happen if a POSITA hypothetically attempted to use the die 25 (shown in Portelli Figures 7 and 8) on a tray having an edge profile such as Portelli's Figure 13. *See* Pet. at 78. This crude drawing is the epitome of speculative hindsight reconstruction and is unsupported by any physical testing. Because Figures 12 and 13 only show what may be achieved at only a single point about the perimeter of a tray, Portelli's sketch work figures do not contemplate the complication that arises when attempting to inwardly-deflect all peripheral portions of an article about its perimeter, whether simultaneously or sequentially. As previously discussed, folding all portions of the periphery will necessarily induce formation of sharp points, wrinkles, folds, or puckers therein, resulting in a non-smooth periphery, which is the opposite of what the challenged claims require.

Portelli's and Petitioner's speculation as to what would happen to an entire thermoformed article based on a single cross-section would not have been sufficient to enable a POSITA to devise a method to achieve the desired smooth periphery even *after* the earliest effective filing date of the '222 Patent. Indeed, CM provides this Board evidence showing that *after* the earliest effective priority date (2018), POSITA in thermoforming engineering could not accurately predict what would actually happen in a thermoforming operation based solely on pictures (which means that the POSITA would have had no ability to make such a

prediction *before* the earliest effective priority date). CM's non-enablement evidence is as follows:

In a February 26, 2018 email from Mr. Timothy McKeever of Clearly Clean Products LLC (CM's exclusive licensee of the '222 Patent), Mr. McKeever provided Mr. Pieter Jans-Willemse of Dexter MT, a thermoforming manufacturer, the following illustration:



Ex. 2006 at 2. In response to Mr. McKeever's email, Mr. Willemse wrote the following in his reply email of March 5, 2018:

As discussed last week we had a long meeting today with all engineers involved in the RRIM® technology to see where we are with creating your type of rim (very high and having the smooth radius on the outside).

I've also attached our patent tot his mail so (if you want) you can have a more detailed look about what is happening in the process...

To be clear as to where we are *at this moment: We cannot guarantee the detailed shape of your rim without performing quite an extensive series of tests and optimisations to create your rim.* To clarify this a .ittle [sic.] further: What we did is set-up the design of the rim and go through all the steps. *For each step there are some parts that we know and have experience in (by now), but also some that are new (duet o the design), and these lead to the necessity to perform tests, to see if what we think will happen, really happens.*

*

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As I mentioned in the first line, *we need to work in partially unexplored territory.* We also know from past tests that this does not mean that is is impossible, but it means that *we need to do more testing to find this out.* This also means that it is not suited to go into a fixed time-shedule where you want o have your prpduction [sic.] up and running [sic.] in 6 months, as this risk is simply too big (for you but alsof or us).

See Ex. 2007 at 1-2 (Mar. 5, 2018 Email from Pieter-Jan Willemse of Dexter MT to Timothy McKeever).

If POSITA years after the priority date of the ‘222 Patent needed to engage in an “extensive series of tests and optimisations” to try and recreate a drawing using thermoforming equipment in existence after the priority date, Petitioner and Mr. May cannot credibly argue that a POSITA *before* the priority date of the ‘222 Patent would know the results of subjecting an article with an entire periphery like the one illustrated in Portelli Figure 13 to a vague die method illustrated in Portelli’s Figures 7 and 8. Since Mr. May failed to perform any tests to make sure that what he thinks would have happened using Portelli’s Figure 13 edge in a die 25 from Portelli’s Figure 8 would actually happen, *cf.* Ex. 1003 at 183-185 (no testing), May’s expert opinions regarding hypothetical processes and sketches from Portelli are all rank speculation. The same criticism is true for Portelli itself, which unlike the ‘222 Patent, lacks any proof of a physical article supposedly made by its hypothetical sketch methods. At best, Portelli reads like an incomplete research paper addressing a hoped-for goal but lacking any of the testing and optimizations to demonstrate that it would function or accomplish whatever it proposes.

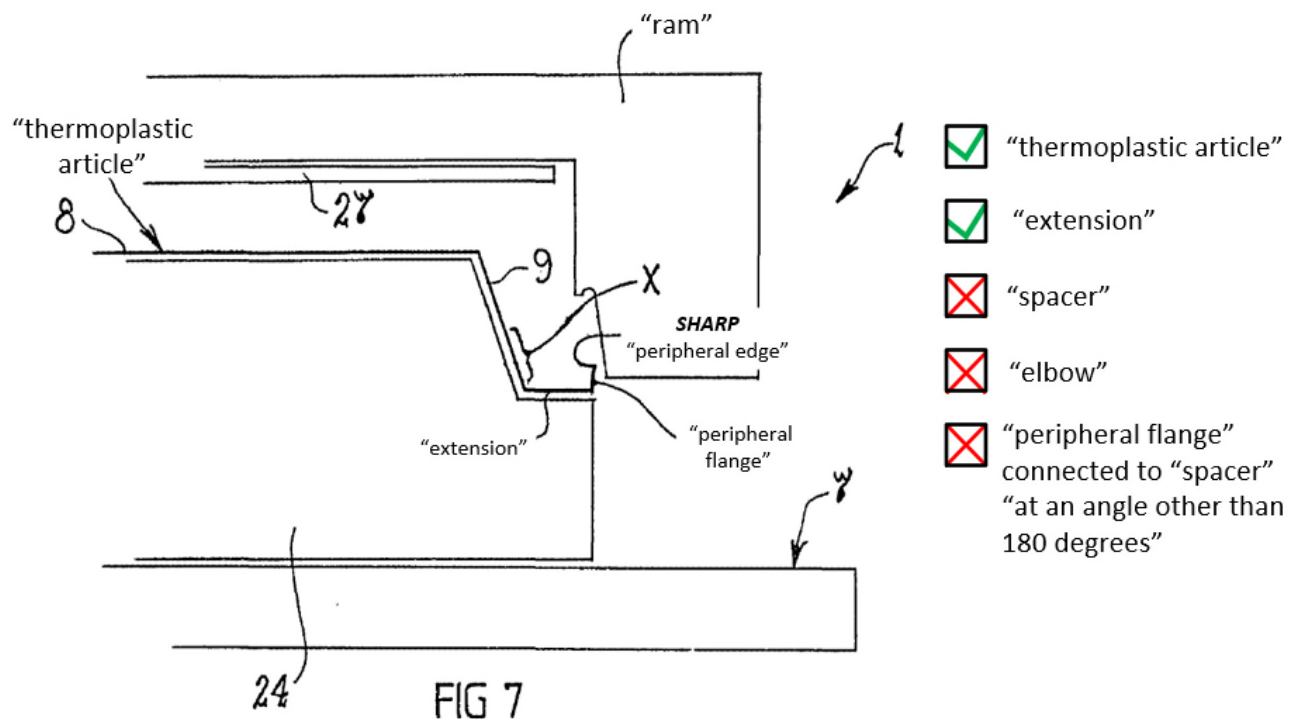
The Petition’s reliance on Portelli Figure 13 to show pre-impingement versions of the thermoformed article of Portelli is also a contradiction of Portelli’s express disclosures. *See* Ex. 1004 at 14:15-18 (“As can be seen in Fig. 13 this gives the finished tray product a more rounded peripheral edge region which is preferable to the edge region shown in Fig. 2.”); Homeland Housewares, 865 F.3d

at 1378-79 (disregarding expert testimony that “is plainly inconsistent with the record.”) Neither the Petition nor the expert whose report it cites provide any rational basis for why a POSITA reading Portelli would disregard Portelli’s express teaching that Figure 13 illustrates the profile of a “finished tray product” and then treat Figure 13 as the profile belonging to an *un*-finished tray precursor (i.e., a product prior to impingement by a ram). Again, the sharp terminal edge 12 in Portelli’s Figure 13 is *not* the periphery of the article as required by all challenged claims. Therefore, a POSITA would not be motivated to employ an article having Portelli’s Figure 13 cross-section at its edge and use it as a pre-impingement article according to the method recited in the challenged claims.

3. Portelli’s Figures 7-8 Do Not Show a Pre-Impingement Article Used According to the Claimed Methods.

Like its erroneous reliance on Portelli Figure 13, the Petition relies on Portelli Figure 8 to disclose pre-impingement limitations of the challenged claims. *See* Pet. at 27-30 (Claim 1[C]-[D]). Again, Portelli described its Figure 8 embodiment as “a schematic sectional front elevation of the apparatus of Fig. 7, *after the deforming operation has taken place.*” Ex. 1004 at 8:1-2. To interpret Figure 8 of Portelli as showing the edge of a thermoformed article prior to impingement with a ram is an unsupported, contradicted, and unreasonable reading of the Portelli reference. Rather, Portelli describes its Figure 7 as “a schematic sectional front elevation of an apparatus for performing the invention ... *prior to*

the deforming operation taking place[.]” Ex. 1004 at 7:28-30. Had Petitioner properly applied the pre-impingement article claim limitations of the challenged claims (including presence of an “extension,” a “bend region,” a “spacer,” an “elbow,” and a “peripheral flange”) to Portelli’s pre-impingement embodiment of Figure 7, it would have had to concede that Portelli failed to disclose the required pre-impingement thermoplastic article necessitated by the claimed methods:



Portelli, Fig. 7 (annotations supplied).

The Petition asserts that Portelli’s Figure 8 “show[s] the ram having contacted the peripheral flange and deflected the spacer towards the extension, but still having some distance to travel and re-engage with the article.” *Id.* at 43 (citing Ex. 1003, ¶126). That is not what Portelli discloses. Portelli describes Figure 8 as

the *post* impingement result of using the die 25 of Portelli's hypothetical forming process on thermoplastic article 5 with the profile illustrated in Figure 7:

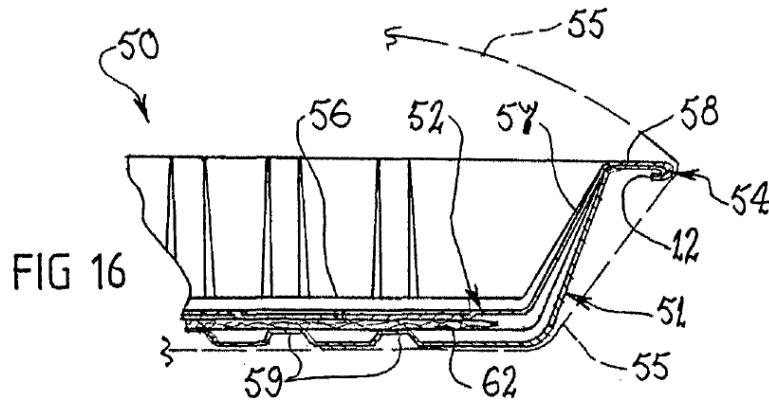
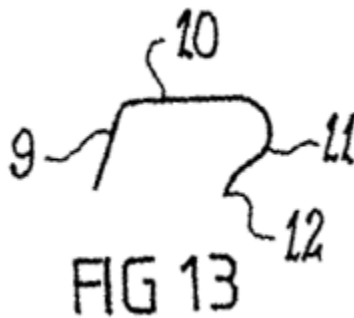
As a result, the peripheral edge region 11 of the tray 5 is brought into contact with the die 25. This heats the peripheral edge region 11 of the tray making it malleable and then deforms or rolls the peripheral edge region 11 of the tray 5 such that the edge 12 is displaced out of the wrap path. *This position is illustrated in Fig. 8.*

Ex. 1004 at 13:21-25.

Consequently, the Petition cannot rely on Figures 7 and 8 to show the claimed methods in this case.

4. Portelli's Figures 14-16 Do Not Show a Pre-Impingement Article Used According to the Claimed Methods.

The Petition confusingly refers to Portelli's Figures 14 and 15 while also discussing the views illustrated in Portelli's Figures 8 and 13. *See, e.g.*, Pet. at 14 (citing Figs. 14-15 for Claim 1[A]). For example, the Petition refers to Portelli Figure 14 as disclosing the deflectable flange as item 58 and then refers to the "deflectable flange" as item 10 in Figure 13. *See id.* However, the Petition fails to disclose that Portelli Figure 13 is not the cross-sectional view of the tray of Figure 14. To the contrary, Portelli discloses that "**Fig. 16** is a cross-sectional view of the tray of Figs. 14 and 15, the section through XVI-XVI." Ex. 1004 at 8:17-18. Portelli discloses materially different cross-sections for Figures 13 and 16:



Neither the Petition nor the expert whose report it cites explains why a POSITA would disregard this illustrative depiction in Portelli's Figures 13 and 16 or supply a reason to contradict Portelli's express disclosures.

Like its failure to explain how or why a POSITA would convert an article with edges shown by Figure 12 into an article with edges shown by Figure 13, Portelli omits any description or illustration of the pre-impingement version of the article illustrated by Figures 14-16 or the method of achieving the hoped-for final version illustrated in Figures 14-16. In other words, there is no disclosure in Portelli of the method used to make an article appearing in Figures 14-16. Therefore, the mere depiction of a hoped-for article in Figures 14-16 and whatever inherent benefits such articles might exhibit if they could be made do not render CM's claimed methods obvious. *See Honeywell Int'l Inc. v. Mexichem Amanco Holding S.A.*, 865 F.3d 1348, 1354-55 (Fed. Cir. 2017) ("that which may be inherent is not necessarily known and that which is unknown cannot be obvious.")

B. PORTELLI FAILS TO DISCLOSE OR ENABLE A METHOD THAT YIELDS AN ARTICLE WITH A SMOOTH PERIPHERY WITH A REASONABLE EXPECTATION OF SUCCESS

As discussed *supra*, the cross-sections of each of the Portelli embodiments relied upon by Petitioner as evidence of the claimed pre-impingement articles suffer the same detrimental defects: a lack of a spacer and a lack of an elbow. The ‘222 Patent specifies that impinging a thermoformed article lacking a spacer and an elbow with a ram will create *non-smooth* edges:

In previous trays which included an exterior flange (e.g., a tray having a periphery like that shown in FIG. 1A, lacking the bend region **150**, the spacer **140**, the elbow **130**, and the peripheral flange **120**, and having the peripheral edge **110** at the periphery of the extension **50**), bending or rolling of the exterior flange might have been possible along straight edges, but bending or rolling curved edges and corners of such exterior flanges could not be performed without buckling or wrinkling of the material in the flange, yielding an undesirable non-smooth edge. It is the presence of the smooth bend region **150** and the spacer **140** of the deflectable flange described herein that permits the peripheral edge **110** to be deflected away from the periphery of the article without such buckling or wrinkling, yielding a smooth periphery.

Ex. 1001, 12:56-13:3. It is for this reason that thermoform manufacturers like DexterMT considered using ram-based methods for rolling the edge of a thermoformed article “impossible” prior to the August 31, 2015 priority date of the

‘222 Patent. *See* Ex. 2003 at 5. Indeed, thermoform engineers at Dexter MT believed in 2018 that with just a sketch of a desired end product, there would still need to be extensive testing and optimization to determine if what they think will happen, really happens. *See* Ex. 2007 at 1-2. These POSITA came to this conclusion in 2018 based on drawings that are much clearer and more detailed than Portelli’s rough line sketches.³ *Compare* Ex. 2006 at 2 *with* Ex. 1004, Figures 1-16. The fact that POSITA on and after the priority date of the challenged claims would have very likely considered Portelli’s use of rams on thermoformed articles lacking an elbow and spacer to be incapable of forming non-smooth peripheries all about the article is both evidence of non-enablement of Portelli’s methods as well as evidence that POSITA lacked a reasonable expectation of success in achieving the hypothetical hand-sketched results depicted in Portelli. *See* AK Steel Corp. v. Sollac & Ugine, 344 F.3d 1234, 1244 (Fed. Cir. 2003) (statement in patent specification that “discourages experimentation” with particular technology shows non-enablement of same); In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Pat. Litig., 676 F.3d 1063, 1081 (Fed. Cir. 2012) (“there can be little better evidence negating an expectation of success than actual reports of failure.”)

³ Exhibits 2006 and 2007 have been authenticated by Mr. Millard Wallace, the named inventor of the ‘222 Patent, in a separate IPR. Ex. 2009.

Portelli does not disclose any method by which the peripheral portions of a tray may be bent inwardly about its entire periphery without forming sharp points, wrinkles, folds, or puckers at one or more portions of the periphery. The methods disclosed in Portelli therefore fail to satisfy the requirement of each challenged claim that the method yield “a body with a smooth periphery.”

For at least the above reasons, the Petition’s challenge to Claims 6-10 and 21 based on Portelli fails and institution of a trial on Ground 1 should be denied.

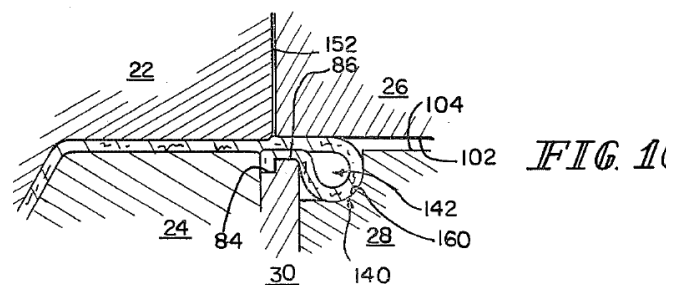
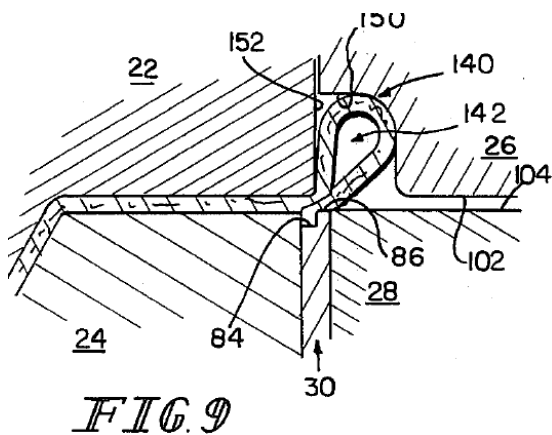
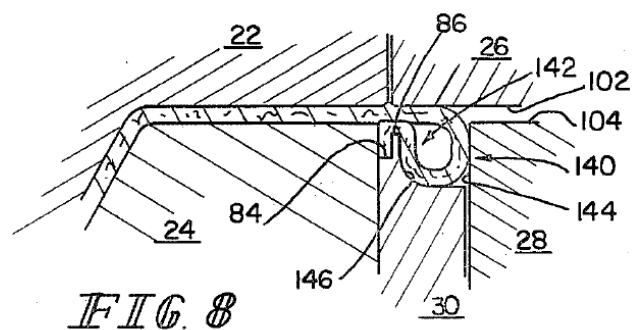
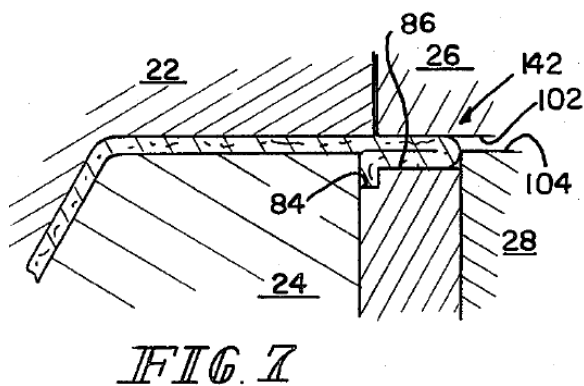
IV. THE DEFICIENCIES IN PETITIONER’S OBVIOUSNESS CHALLENGES BASED ON MEADORS (GROUND 2)

Petitioner relies on Meadors’ Figures 1-2 and 6-10 and the disclosures referencing those figures to argue obviousness of ‘222 Patent claims 6 and 21. Like it failed to do in Ground 1, the Petition omits any analysis of the Graham factors using any of the exemplary rationales for obviousness in M.P.E.P. § 2141(III) (Rev. 1, 2024).

A. Meadors Does Not Teach or Enable a POSITA to Make Articles Having the Peripheries Illustrated In The Reference Using A Material Other Than Paper Stock

Every challenged claim recites a method to be used on a thermoplastic. In contrast, Meadors states, “[t]he method and apparatus will be described in the context of forming paper stock between dies....” Ex. 1005, 1:10-11. Every figure from Meadors that was relied upon in the Petition illustrates the metallic dies 22, 24, 26, and 28 surrounding a fiber or paper stock blank of material based on the

FIBRE, LEATHER, PACKING



While Petitioner asserts that Meadors mentions the possibility of using a thermoplastic, there is no method disclosed in Meadors involving a thermoplastic

pre-impingement or post-impingement article. The Petition provides no evidence that the thermoplastic referred to in Meadors will act the same way in response to the same methods that Meadors applies to a paper blank and achieves the same results. Without any such evidence, the Petition's assumption is hindsight speculation and non-enabling. *See Genentech, Inc. v. Novo Norodisk A/S*, 108 F.3d 1361, 1366 (Fed. Cir. 1997) (“[W]hen there is no disclosure ... of any of the conditions under which a process can be carried out, undue experimentation is required.”)

B. Meadors Fails to Disclose “The Spacer and Peripheral [sic.] Flange Being Connected, at an Angle Other Than 180 Degrees, at an Elbow”

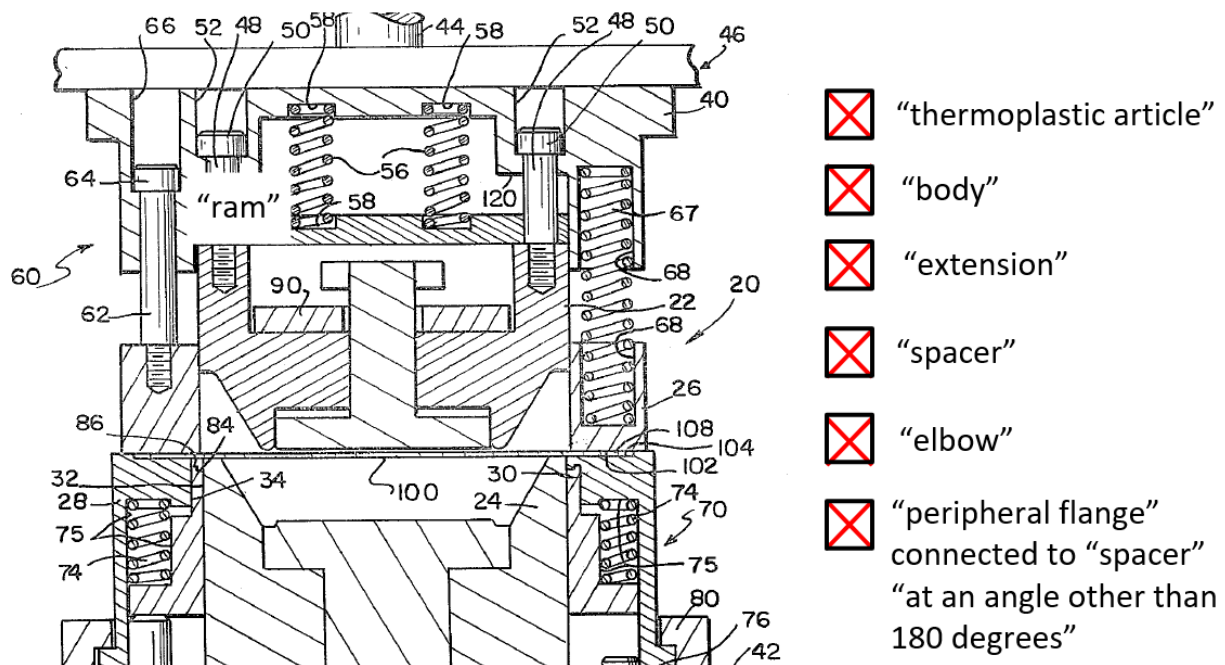
Meadors discloses that its Figure 1 illustrates the “beginning of a step of the method;” Figure 2 illustrates “a subsequent step of the method,” Figure 3 illustrates “a step of the method subsequent to that illustrated in FIG. 2;” Figure 4 illustrates “a step of the method subsequent to that illustrated in FIG. 3;” and Figure 5 illustrates, “a step of the method subsequent to the step illustrated in FIG. 4.” *See* Ex. 1005, 2:37-52. Meadors later describes that the paper bead “is finished as illustrated in FIG. 5, and enlarged in FIG. 6.” *See id.* at 4:51-52. Meadors then describes Figure 6 as “an enlarged, fragmentary vertically sectioned side elevational view of the apparatus illustrated in FIG. 5,” and that Figures 7-10 are alternatives of the structure illustrated in Figure 6. *Id.* at 2:53-58. Petitioner is

aware of this sequence of operation of the Meadors method. *Compare supra* with Pet. at 158-159.

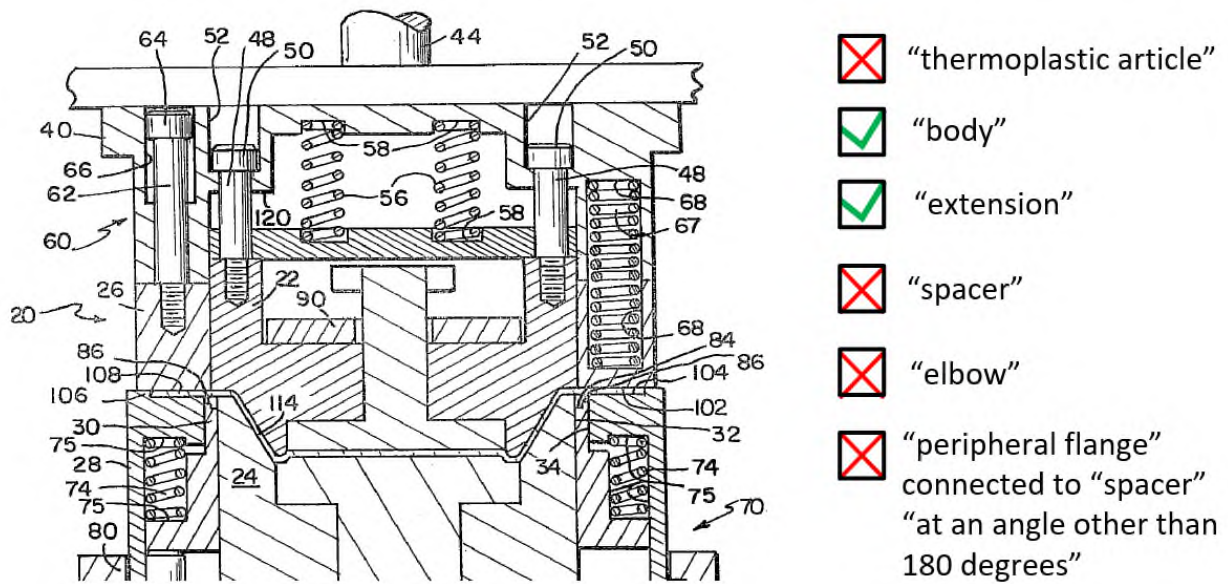
The Petition relies on Figures 4 and 8 of Meadors to disclose pre-impingement limitations 1[A], 1[B], 1[C], and 1[D] of the challenged ‘222 Patent claims. *See* Pet. at 95-113. Petitioner took the position that Meadors’ Figure 3 discloses, “impinging a ram against the peripheral flange to deflect the spacer towards the extension.” *See* Pet. at 114. However, the challenged claims require a pre-impingement article to already exist *before* “impinging a ram against the peripheral flange” of that pre-impingement article. Because Petitioner took the position that Meadors’ Figure 3 depicted the “impinging” method step, then Petitioner is barred from asserting that the structure illustrated in Meadors Figure 4 (which Meadors discloses as existing *after* the step illustrated in Meadors Figure 3) discloses a “deflectable flange” of a pre-impingement article. In fact, Petitioner apparently relies on Meadors’ Figure 4 to show the claimed method step “where spacer is deflected towards the extension by the ram (ring 30), as seen in Meadors Fig. 4....” *See* Pet. at 115. Putting aside the Petition’s contradictory use of Meadors Figure 4, the Petition cannot rely on the same method steps to satisfy two different claim elements, which in this case is an article in a pre-impingement and a post-impingement configuration.

The same defect created by Petitioner's reliance on Meadors Figure 4 also plagues Petitioner's reliance on Meadors Figure 8. As discussed above, Meadors Figure 8 is an alternative of Meadors Figure 6, which itself is an exploded view of the "finished" product illustrated in Meadors Figure 5. In other words, if Figure 8 illustrates an alternative "finished" product, it cannot possibly show any "deflectable flange" of an un-finished, pre-impingement article as required by the challenged claims.

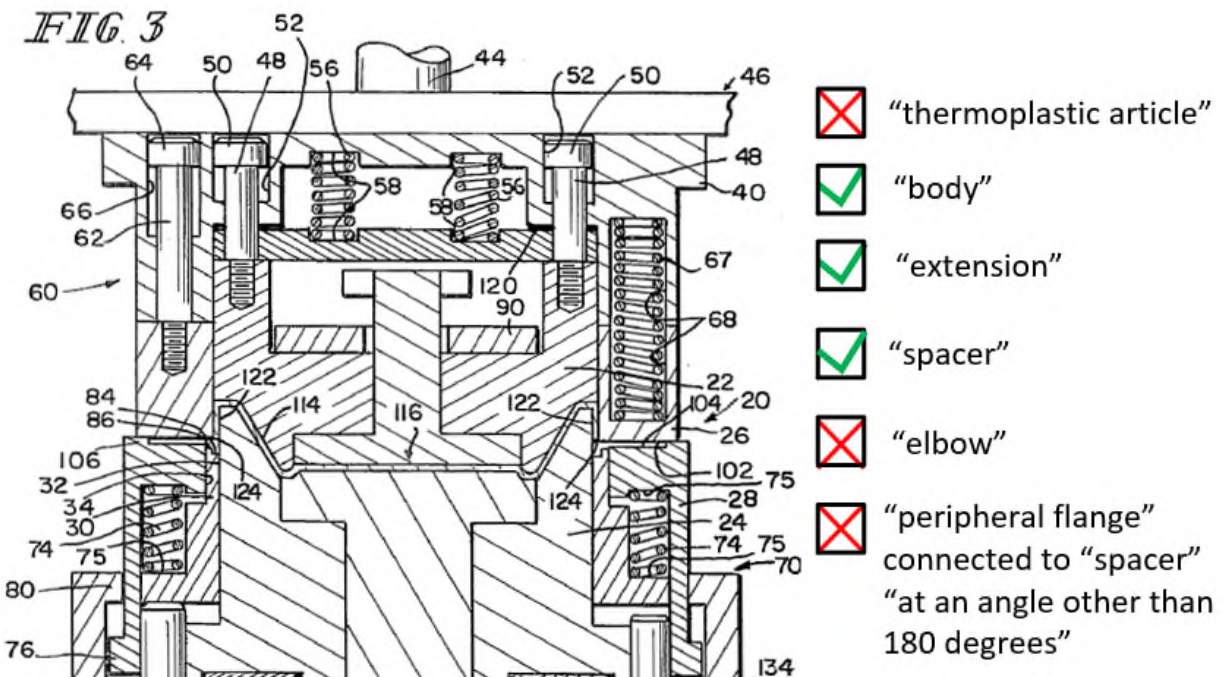
Had the Petitioner properly considered Meadors' disclosure of articles that had been formed prior to the impinging step that Petitioner asserts is illustrated in Meadors Figure 3, then Petitioner would have had to concede that no potential pre-impingement article of Meadors can show a spacer connected to a peripheral flange by an elbow at an angle other than 180 degrees:



Ex. 1005, Fig. 1 (annotations supplied).



Ex. 1005, Fig. 2 (annotations supplied).

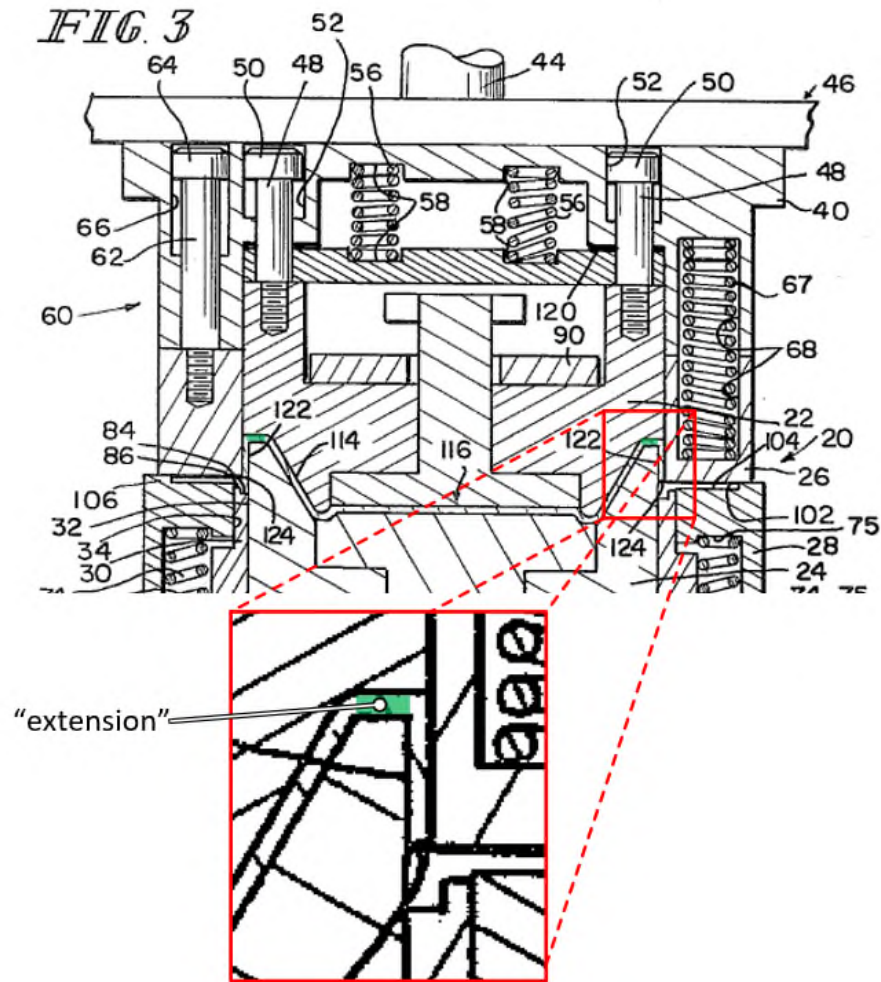


Ex. 1005, Fig. 3 (annotations supplied).

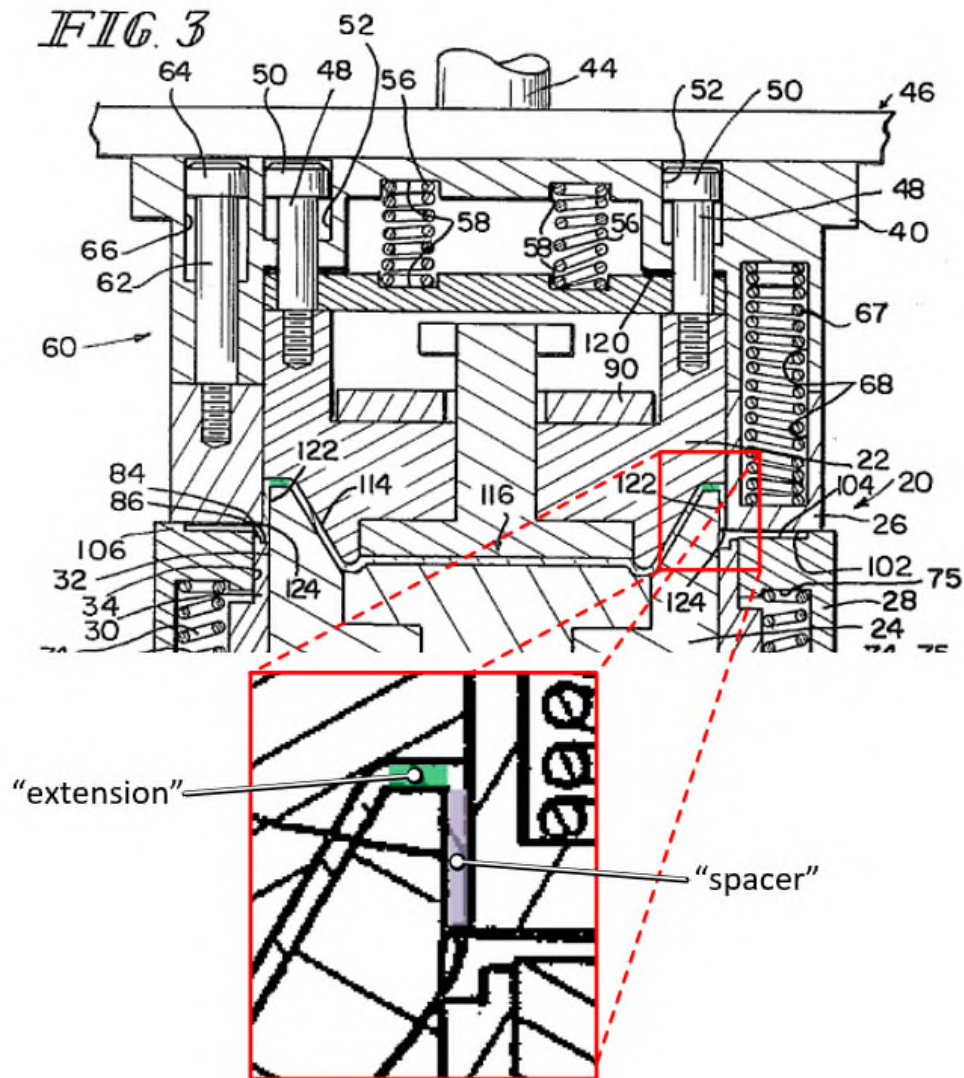
Even if Petitioner's citation to Meadors' post-impingement illustration in Figure 4 was somehow considered a pre-impingement article recited in the challenged claims, Petitioner never identified in Meadors Figure 4 what it contends was the "spacer," the "elbow," or the peripheral flange being connected to the spacer at an angle other than 180 degrees. *Cf.* Pet. at 94, 96, 100, 115-116, 123-124, 133-135, and 144-145. That failure creates an unsalvageable defect in the Petition on which the burden of proof is born exclusively by Petitioner.

Consequently, Petitioner has failed to show by a preponderance of evidence that Meadors discloses the pre-impingement article of the challenged claims with the recited deflectable flange, spacer, elbow, and connection between spacer and peripheral flange via the elbow at an angle other than 180 degrees.

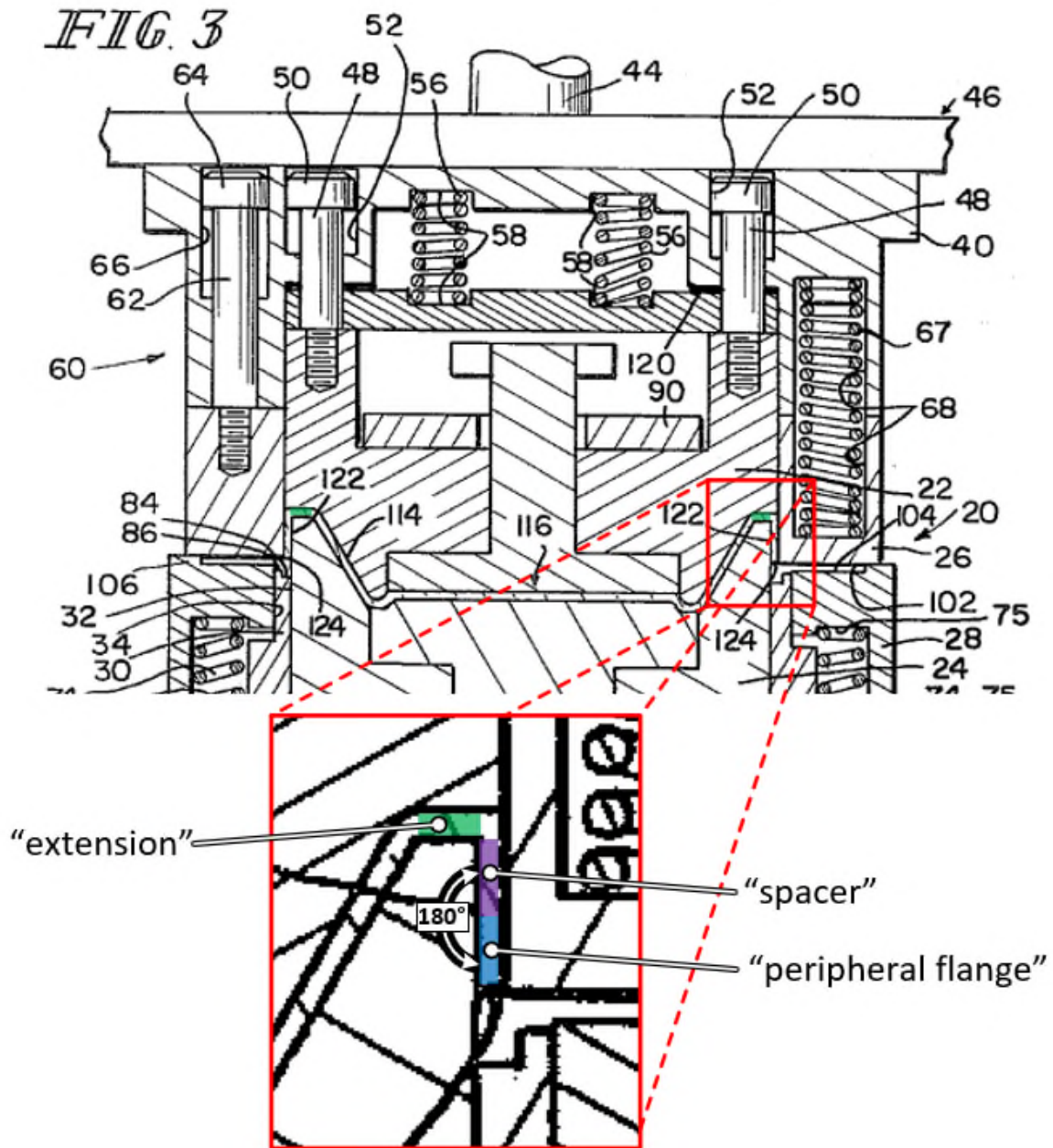
The only figure in Meadors that provides a pre-impingement article having what can possibly be called a "spacer" that is interconnected to the extension at an approximate right angle is Figure 3. In Figure 3 of Meadors, the nearest analog of the "extension" recited in the challenged claims is embodied as the horizontally oriented piece of paperboard material interposed between items 22 and 24 (highlighted in green below).



The portion of the paperboard article interposed between items 22 and 24 that is connected to this “extension” and oriented at approximately a right angle thereto is the nearest analog of the “spacer” recited in the claims (highlighted in purple in the figure below).



As illustrated in the annotated version of Meadors Figure 3 below, there is no portion of the article that can correspond to the claimed “peripheral flange” (which must be connected to the “spacer” via an “elbow” to be “at an angle other than 180 degrees”).

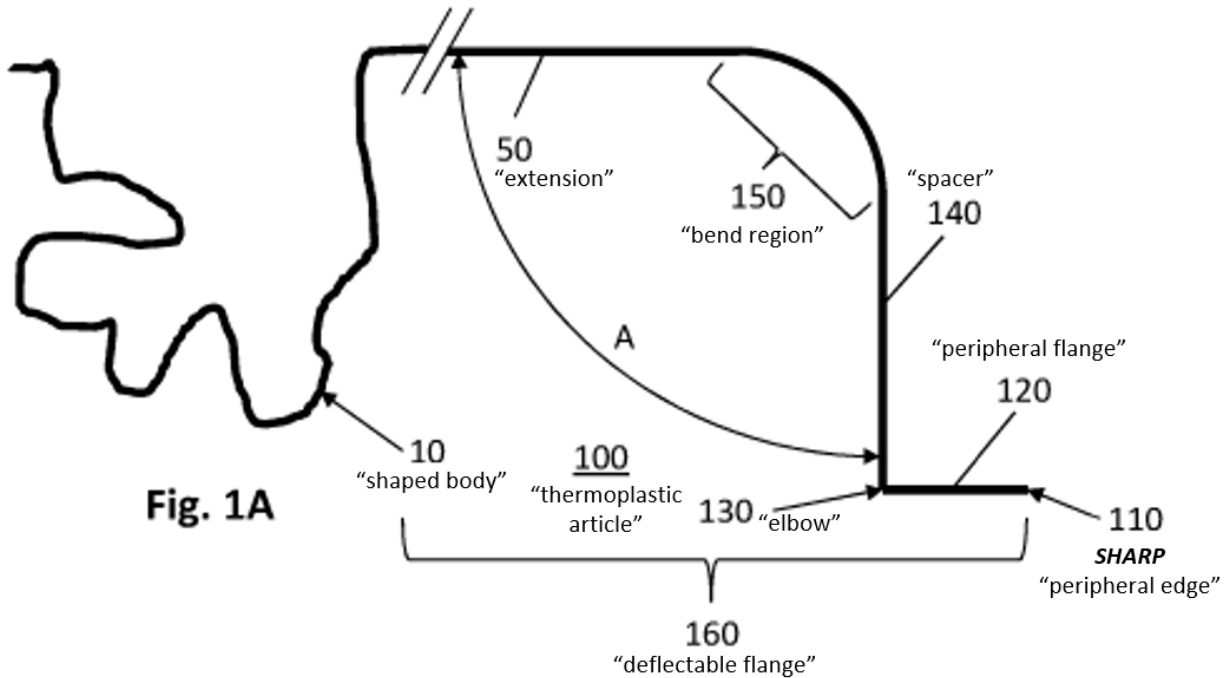


Whichever interpretation one applies to the only pre-impingement article disclosed in Meadors, i.e., Meadors Figure 3, the result is to either admit that Meadors only discloses a “spacer” and fails to disclose the required “peripheral flange” (as already argued *supra*), or admit that one has to divide the “spacer” into a “spacer” and a “peripheral flange,” in which case Meadors fails to disclose a “spacer” and a

“peripheral flange” connected to one another at an angle *other than* 180 degrees. In either scenario, Meadors fails to disclose every limitation of the challenged claims of the ‘222 Patent, and Petitioner has failed to explain any basis with rational underpinnings why these missing limitations would be obvious to a POSITA as of the earliest effective filing date of the challenged claims.

C. Meadors Fails to Disclose Any Embodiment in Which the Angle Between the Spacer and the Extension is Decreased Upon Impingement of a Ram Against a Peripheral Flange

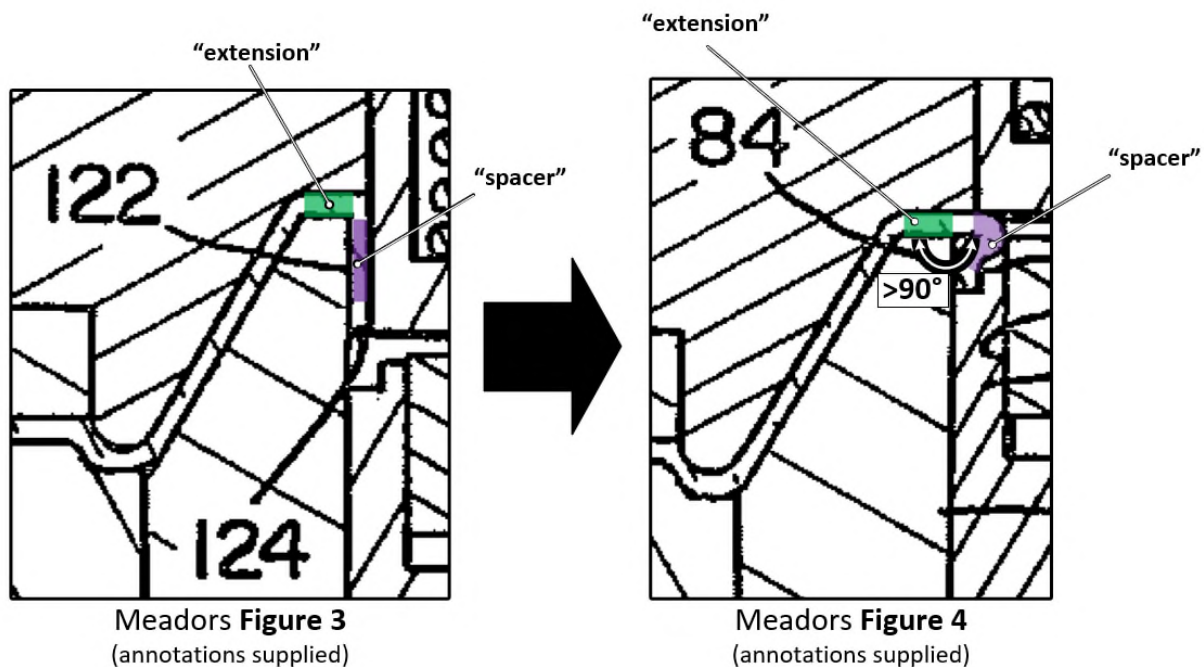
The challenged claims require that the pre-impingement article has a shape that includes a deflectable flange about its entire periphery. That deflectable flange includes “an extension that extends peripherally away from the body and connects thereto.” The deflectable flange of the pre-impingement article also includes “a bend region ... interconnecting the extension, at an approximately right angle, with a spacer.” Note that this “right angle” is the angle “A” in Fig. 1A of the ‘222 Patent below:



Further, in the deflectable flange recited in the challenged claims, the “spacer... is connected with a peripheral flange ... at an angle other than 180 degrees.” In the methods recited in the challenged claims, a “ram” is impinged against the peripheral flange and, as a result, *“the angle between the spacer and the extension is decreased.”* That is, in the claimed methods, impingement of a ram against the peripheral flange results in a decrease in the magnitude of angle “A.” The methods disclosed in Meadors operate in precisely the opposite manner, namely, they result in increasing the magnitude of angle A upon impingement of the nearest analog of the recited “ram” upon the nearest analog of the recited “peripheral flange.”

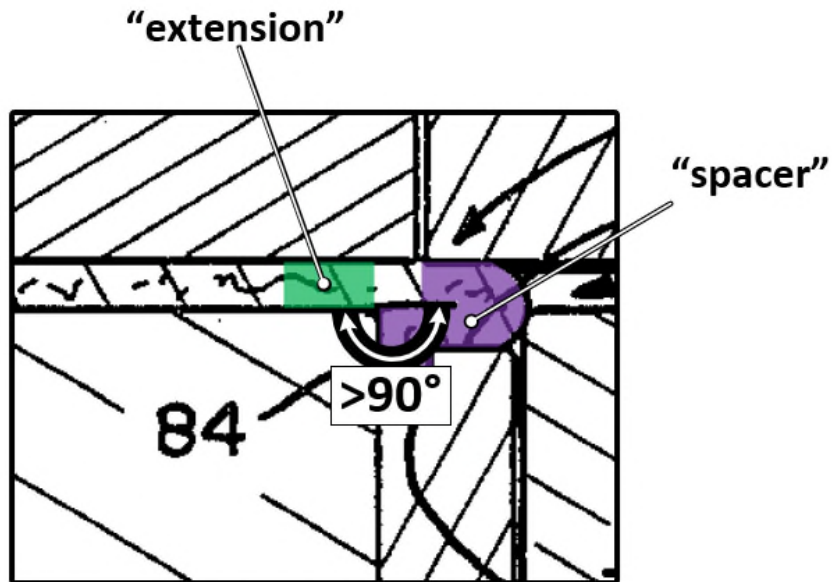
A POSITA may recognize the possibility of an intermediate step between the ones illustrated in Meadors’ Figures 3 and 4 in which the paperboard article may have

an extension interconnected to a “spacer” by a right angle and a “peripheral flange” interconnected to the “spacer” at an angle other than 180 degrees (i.e., a pre-impingement paperboard article). Assuming there is such an intermediate step and the existence of a “spacer” and “peripheral flange” as claimed, the POSITA would have understood Meadors to disclose a method in which the “spacer” in response to impingement of a ram against the peripheral flange results in an increase in the magnitude of angle “A” – the opposite of what is required by the challenged claims – as illustrated below:

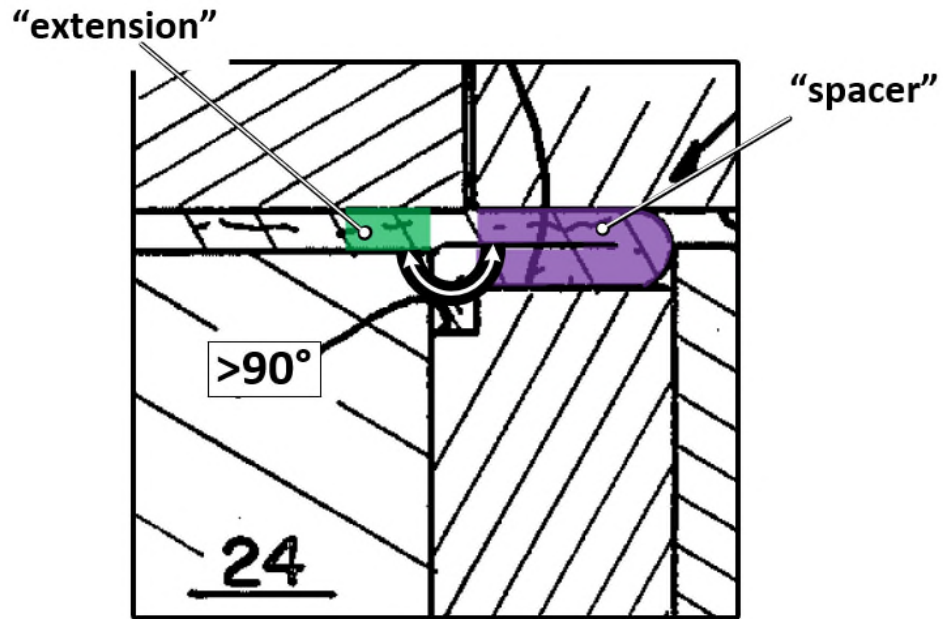


A POSITA would find that to the extent that Meadors disclosed the claimed “spacer” in the challenged claims, every post-impingement article depicted in Meadors illustrates how the “spacer” is deflected *away* from the “extension” after the peripheral flange has been impinged by ring 30 (what Petitioner calls the

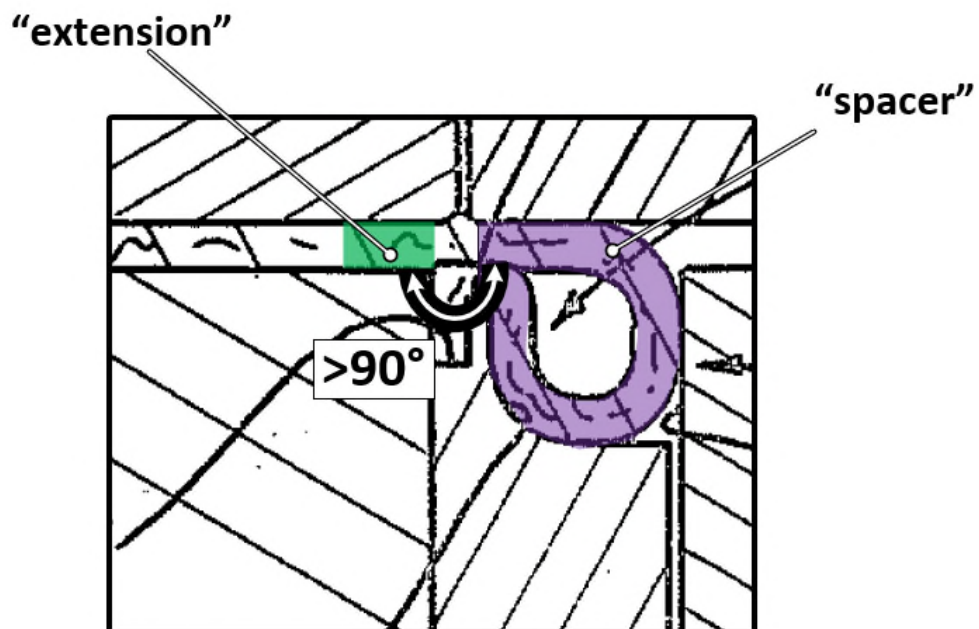
claimed “ram”) and that the angle between the alleged “spacer” and the “extension” has increased (i.e., has become an angle greater than 90 degrees) in response to such impingement:



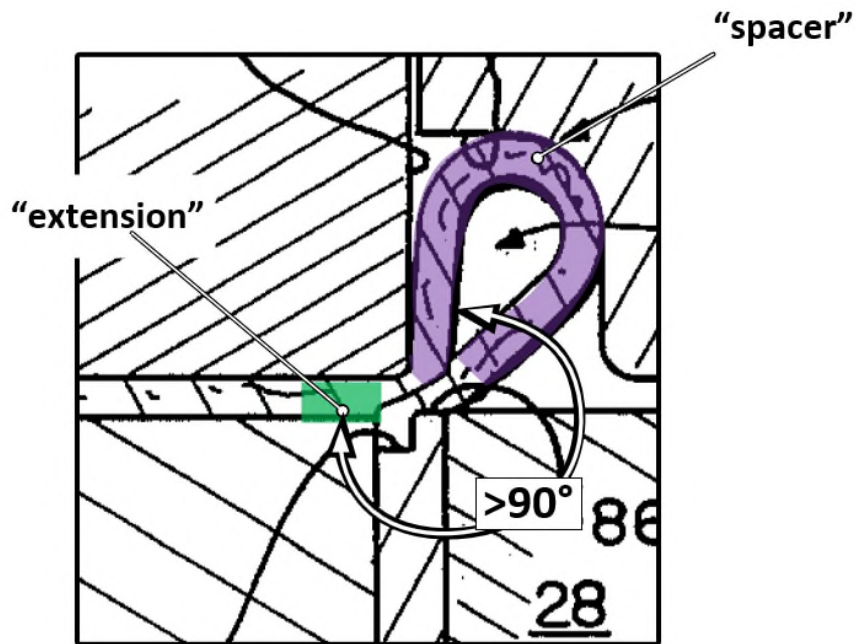
Meadors Figure 6
(annotations supplied)



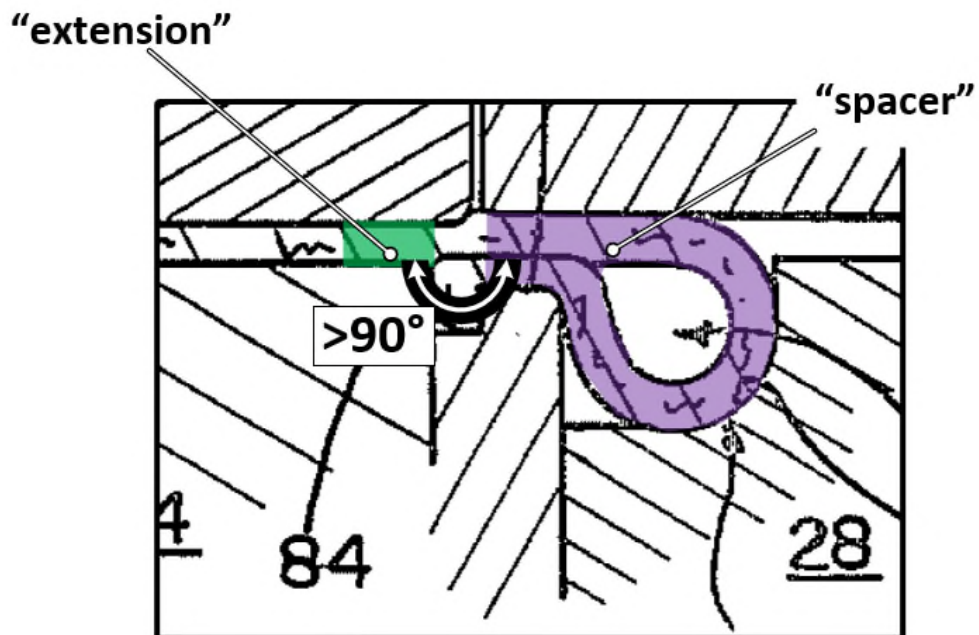
Meadors **Figure 7**
(annotations supplied)



Meadors **Figure 8**
(annotations supplied)



Meadors **Figure 9**
(annotations supplied)



Meadors **Figure 10**
(annotations supplied)

As illustrated by the annotated figures of Meadors above, the POSITA would readily observe that Meadors' methods result in the opposite of what is recited by the challenged claims. As the Petitioner has provided no rational or reasoning for a POSITA to contradict what Meadors expressly teaches (or do anything different than what it expressly discloses to resolve the above defects), Petitioner has failed to prove by preponderance of the evidence that Meadors teaches, discloses, or suggests each limitation of Claims 6 and 21 of the '222 Patent.

D. MEADORS FAILS TO DISCLOSE OR ENABLE A METHOD THAT YIELDS A THERMOPLASTIC ARTICLE WITH A SMOOTH PERIPHERY WITH A REASONABLE EXPECTATION OF SUCCESS

For the reasons discussed in Section II.B *supra*, the fact that Meadors fails to disclose how its method would operate on a thermoplastic, fails to disclose a method that operates on a pre-impingement article of the type claimed, and fails to disclose how its method would deflect any alleged "spacer" in any such article toward the extension while decreasing the angle between the same indicates that any thermoplastic article subjected to its paper forming methods would also lack a reasonable expectation of success and require undue experimentation to achieve a smooth periphery on or before the priority date of the challenged claims of the '222 Patent.

For at least the above reasons, the Petition's challenge to Claims 6 and 21 based on Meadors fails and institution of a trial on Ground 2 should be denied.

V. CONCLUSION

For the foregoing reasons, this Board should find that the Petition has failed to show unpatentability of the challenged claims of the '222 Patent by the preponderance of the evidence and should deny institution regarding the same.

Dated: December 13, 2024

Respectfully Submitted,

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WORD COUNT CERTIFICATION

Pursuant to 37 C.F.R. § 42.24(d), I certify that this Corrected Patent Owner Response contains 6,718 words (excluding the title page, table of contents, table of authorities, table of exhibits, mandatory notices, this certificate, and the certificate of service), as determined by Microsoft Word.

Dated: December 13, 2024

/s/ Joseph A. Farco

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the 13th day of December, 2024, a true and accurate copy of the foregoing *Patent Owner Preliminary Response* was filed through the Patent Review Processing System and served on the following counsel for Petitioner via email:

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Dated: December 13, 2024

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