

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PROVISUR TECHNOLOGIES, INC.,

Petitioner,

v.

TEXTOR MASCHINENBAU GMBH,

Patent Owner

Case Nos. IPR2024-00258 and IPR2024-00269
U.S. Patent Nos. 10,647,013 and 11,331,823

**DECLARATION OF PROFESSOR THOMAS R. KURFESS, Ph.D, IN
SUPPORT OF PATENT OWNER'S RESPONSES TO *INTER PARTES*
REVIEW OF U.S. PATENT NOS. 10,647,013 and 11,331,823**

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I, Thomas Kurfess, declare as follows:

I. INTRODUCTION

1. I am over the age of 21 and am competent to make this declaration. I make this declaration based on facts and matters within my own knowledge and on information provided to me by others, and, if called as a witness, I could and would competently testify to the matters set forth herein.

II. OVERVIEW AND MATERIALS CONSIDERED

2. I have relied upon my education, knowledge, and experience as well as the other materials as discussed in this declaration in forming my opinions.

3. For this work, I have been asked to analyze and opine on certain issues related to U.S. Patent Nos. 10,647,013 (“the ’013 Patent”) (IPR2024-00258, EX1001) and 11,331,823 (“the ’823 Patent”) (IPR2024-00269, EX1001) and Provisur’s Petitions for *Inter Partes* Review (“IPR”) of the same. In developing my opinions set forth herein, I have considered the materials cited or discussed in Provisur’s IPR Petitions as well as the following additional materials:

- Sensor Technology Handbook (EX2008)
- Deposition Transcript of Mr. Michael Jobin (EX2009)

4. I have considered these materials from the viewpoint of a POSITA as of the priority date of each of the ’013 and ’823 Patents. For the purposes of this declaration, I have been asked to assume that the priority date of both the ’013 and

the '823 Patents is July 3, 2017. My opinions provided in this declaration are made from the perspective of a POSITA as of this priority date of the '013 and '823 Patents, unless expressly stated otherwise.

III. QUALIFICATIONS

5. A copy of my curriculum vitae is attached as Appendix A. Below I provide a brief summary of qualifications relevant to my opinions set forth in this Declaration.

6. I am an expert in the field of food slicing machinery.

7. I received my Ph.D. in 1989 from Massachusetts Inst. of Tech. (MIT) in Mechanical Engineering. Prior to that, I received dual S.M. degrees in Electrical Engineering & Computer Science in 1988 and Mechanical Engineering in 1987. I received my S.B. in Mechanical Engineering in 1986, also from MIT.

8. Recently, I completed a 3 year leave of absence to serve as the Chief Manufacturing Officer for Oak Ridge National Laboratory (ORNL). During that time, I also served as the Founding Division Director of the Manufacturing Science Division at ORNL. My responsibility at ORNL is to develop and execute a long range plan for advanced manufacturing as it applies to ORNL, national laboratories, and the United States.

9. I have extensive experience in academia, governmental organizations, and private industry.

10. My primary research areas include Manufacturing and Automation and Mechatronics, advanced automation, precision manufacturing, metrology, and technology policy.

11. I focus on the design and development of advanced systems targeting complex product production and optimization. My focus spans a wide array of technologies, and includes high precision manufacturing and metrology systems, as well as national and international manufacturing policy issues.

12. I have worked on a variety of mechatronic or robotic systems in my career that include components similar to those used in the food slicing industry. I have also authored several different book chapters and papers that discuss robotic systems and their implementation. For example, I have edited the CRC Handbook on Robotics. I have taught engineering courses at both the undergraduate and graduate level on the topics of control theory, robotics, advanced dynamics, and real-time signal processing and control, all of which are applicable to the food slicing industry.

13. I began my academic career at Carnegie Mellon University where I rose to the rank of Associate Professor. In 1994, I moved to the Georgia Institute of Technology (Georgia Tech) and was appointed Professor in the George W. Woodruff School of Mechanical Engineering. In 2000, I was promoted to the rank of Professor in Mechanical Engineering at Georgia Tech. In 2005, I was named

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Professor and BMW Chair of Manufacturing in the Department of Mechanical Engineering at Clemson University's International Center for Automotive Research. In 2012, I returned to Georgia Tech as a Professor of Mechanical Engineering and the HUSCO/Ramirez Distinguished Chair in Fluid Power and Motion Control. During 2012-2013, I took leave from Georgia Tech to serve as the Assistant Director for Advanced Manufacturing at the Office of Science and Technology Policy in the Executive Office of the President of the United States of America. In this position I had responsibility for engaging the Federal sector and the greater scientific community to identify possible areas for policy actions related to manufacturing. In that role, I coordinated Federal advanced manufacturing R&D, addressing issues related to technology commercialization, identifying gaps in current Federal R&D in advanced manufacturing, and developing strategies to address these gaps.

14. In 2022, I became Chief Manufacturing Officer at Georgia Tech and Executive Director of Georgia Tech Manufacturing Institute. In 2024, I also became a Regents' Professor at Georgia Tech.

15. Additionally, I have served as a special consultant of the United Nations to the Government of Malaysia in the area of applied mechatronics and manufacturing, and as a participating guest at the Lawrence Livermore National Laboratory in their Precision Engineering Program.

16. I served on the Board of Directors for the Society of Manufacturing Engineers (SME), and was President of SME in 2018. I currently serve on the Board of Directors for the National Center for Manufacturing Sciences and the National Center for Defense Manufacturing and Machining. I also serve on the Board of Trustees of the MT Connect Institute.

17. I have significant experience in high precision manufacturing and metrology systems, which I bring to bear in this case.

18. I have received several awards, listed on my attached CV—I am a Fellow of the AAAS, the SME, and the ASME, and am a member of the National Academy of Engineering.

19. In view of my education, experience, and expertise described above, I am at least a person of ordinary skill in the art with respect to the '013 patent.

IV. RELEVANT LEGAL PRINCIPLES

20. I am not a lawyer, and I will not provide any legal opinions. Although I am not a lawyer, I have been advised certain legal standards are to be applied by technical experts in forming opinions regarding the meaning and validity of patent claims.

21. I understand that a patent claim is invalid if it is anticipated or obvious in view of the prior art, and that a claim can be unpatentable even if all of the requirements of the claim cannot be found in a single prior-art reference. I further

understand that invalidity of a claim requires that the claim be anticipated or obvious from the perspective of a person of ordinary skill in the art at the time the invention was made.

22. I have been informed that a patent claim is invalid if it would have been obvious to a person of ordinary skill in the art. In analyzing the obviousness of a claim, I understand the following factors may be taken into account: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; (3) the level of ordinary skill in the art; and (4) any so called "secondary considerations" of nonobviousness if they are present.

23. I have been informed that a claim can be obvious in light of a single prior art reference or multiple prior art references. I understand that to prove that prior art or a combination of prior art renders a patent obvious, it is necessary to:

- Identify the particular references that, singly or in combination, make the patent obvious;
- Specifically identify which elements of the patent claim appear in each of the asserted references; and
- Explain why a person of ordinary skill in the art would have combined the references, and how they would have done so, to create the inventions claimed in the patent. I further understand that exemplary rationales that may support a conclusion of obviousness include:

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- Combining prior art elements according to known methods to yield predictable results;
- Simple substitution of known element for another to obtain predictable results;
- Use of known technique(s) to improve similar devices (methods or products) in the same way;
- Applying a known technique to a known device (method or product) ready for improvement to yield predictable results;
- “Obvious to try” – choosing from a finite number of identified, predictable solutions with a reasonable expectation of success;
- Known work in one field of endeavor may prompt variations of the work for use in either the same field or a different field based on design;
- Incentives or other market forces if the variations are predicable to a person of ordinary skill in the art; and
- Some teaching, suggestion, or motivation in the prior art that would have led a person of ordinary skill in the art to modify the prior art reference or to combine the prior art reference teachings to arrive at the claimed invention.

24. I have been informed that, in considering obviousness, hindsight reasoning derived from the patent-at-issue may not be used.

25. I am informed that it is improper to combine references where the references teach away from their combination. I am informed that a reference may be said to teach away when a person of ordinary skill in the relevant art, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the patent applicant. In general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the patentee. I am informed that a reference teaches away, for example, if (1) the combination would produce a seemingly inoperative device, or (2) the references leave the impression that the product would not have the property sought by the patentee. I also am informed, however, that a reference does not teach away if it merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into the invention claimed.

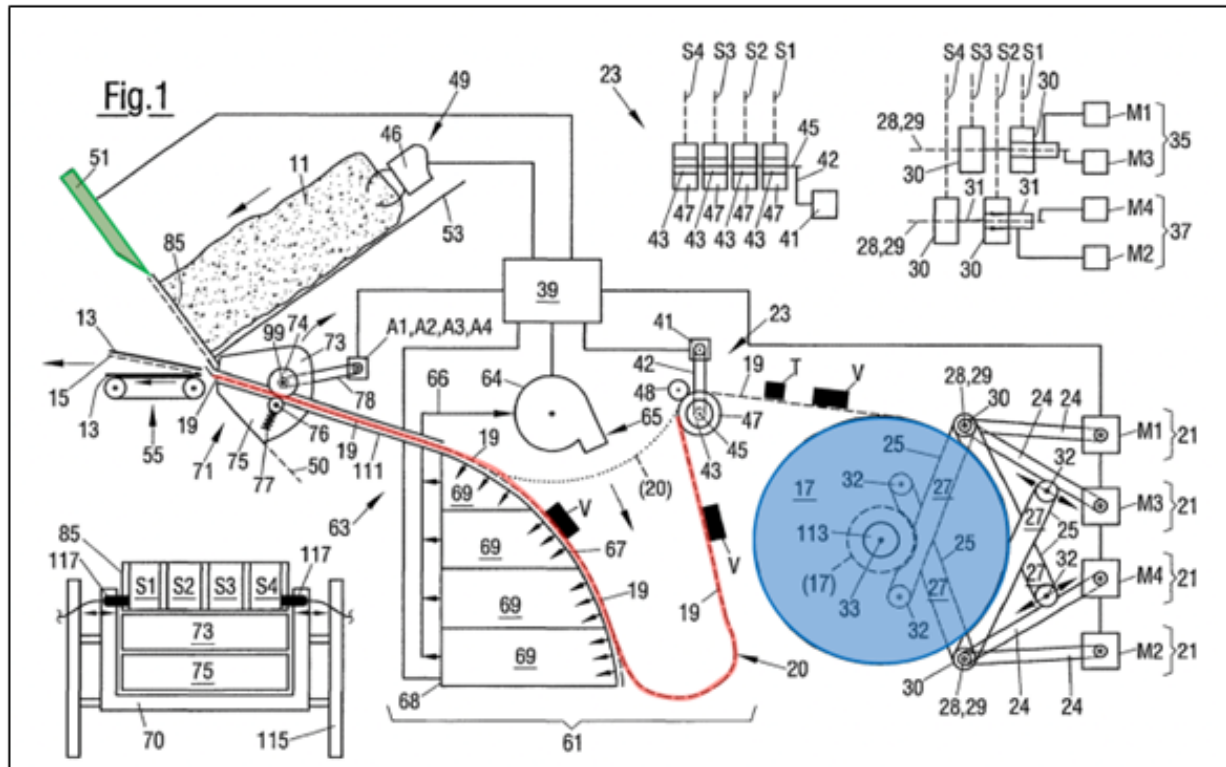
26. I am informed that even if a *prima facie* case of obviousness is established, the final determination of obviousness must also consider "secondary considerations" if presented. In most instances, the patentee raises these secondary considerations of non-obviousness. In that context, the patentee argues an invention

would not have been obvious in view of these considerations, which include: (a) commercial success of a product due to the merits of the claimed invention; (b) a long-felt, but unsatisfied need for the invention; (c) failure of others to find the solution provided by the claimed invention; (d) deliberate copying of the invention by others; (e) unexpected results achieved by the invention; (f) praise of the invention by others skilled in the art; (g) lack of independent simultaneous invention within a comparatively short space of time; and (h) teaching away from the invention in the prior art.

V. BRIEF OVERVIEW OF THE '013 AND '823 PATENTS

27. The challenged independent claims of both¹ the '013 and '823 Patents describe an apparatus for provisioning web-like interleaved sheet material (e.g., paper) at a cutting region in which products (e.g., cheese or meat) are supplied on a track, cut into slices, and interleaved sheets are introduced between slices. IPR2024-00258, Ex. 1001 at claim 2; *see also id.* at claims 17 and 19 (reciting the same); IPR2024-00269, Ex. 1001 at claim 1; *see also id.* at claim 17 (reciting the same). As illustrated in annotated Fig. 1 below, the claimed apparatus comprises several components, including: a material store (e.g., a roll of paper), a cutting region, and a loop store between the material store and cutting region:

¹ Because the '013 and '823 Patents share an identical specification, for ease of reference, citations to the specification reference the '823 Patent only.



'013 Patent, Fig. 1.

28. The loop serves as a buffer between the high speed and dynamic needs of the cutting area and the relatively sluggish material store. *Id.* at 2:24-40 (noting the invention ensures “ejection of the material web into the cutting region is [] reliably decoupled from the process of the removal of the material web from the material store at comparatively high cutting speeds”). To maintain tension over this loose loop, the loop store includes a suction device 63 behind a contact surface 67 that pulls a vacuum. *Id.* at 3:1-3, 12:62-13:31. In this way, the contact surface serves to brake the loop when the loop is pulled out of the loop store into the cutting region during cutting cycles. *Id.*

**VI. PETITIONER'S PROPOSED GROUNDS DO NOT RENDER
OBVIOUS THE CHALLENGED CLAIMS OF THE '013 PATENT**

**A. Ground 1: Petitioner's Proposed Combination of Müller and
Waffner Fails for Several Reasons**

*1. Petitioner Fails to Explain with Particularity the
Proposed Combination*

29. I understand that to satisfy its burden of proving obviousness, Petitioner cannot simply provide conclusory statements. Rather, the petitions must articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness. Furthermore, focusing on purported benefits without explaining how the combination would work in the first place cannot satisfy this burden. The petition here fails to provide the requisite specificity. There is no specific description of how Müller and Waffner are to be combined. From the vague description in the Petition and Mr. Jobin's supporting declaration, I cannot ascertain which specific components from Waffner are intended to be incorporated into the Müller or specifically how these systems are proposed to work together. In the below sections, I have analyzed the Müller and Waffner disclosures and have identified (1) technical incompatibilities between these systems and (2) other reasons no POSITA would have been motivated to combine their teachings. My discussion of these references and their hypothetical combination should not be interpreted to mean that I believe Provisur has described a concrete and specific combination of their teachings. Nor should my analysis be interpreted as capturing all reasons why Müller and Waffner

fail to render the Challenged Claims obvious. Were Petitioner and its expert to identify a concrete and specific combination of these references, there may be additional reasons a POSITA would not have made that combination.

2. Müller is Technically Incompatible with Waffner's Vacuum System Teachings

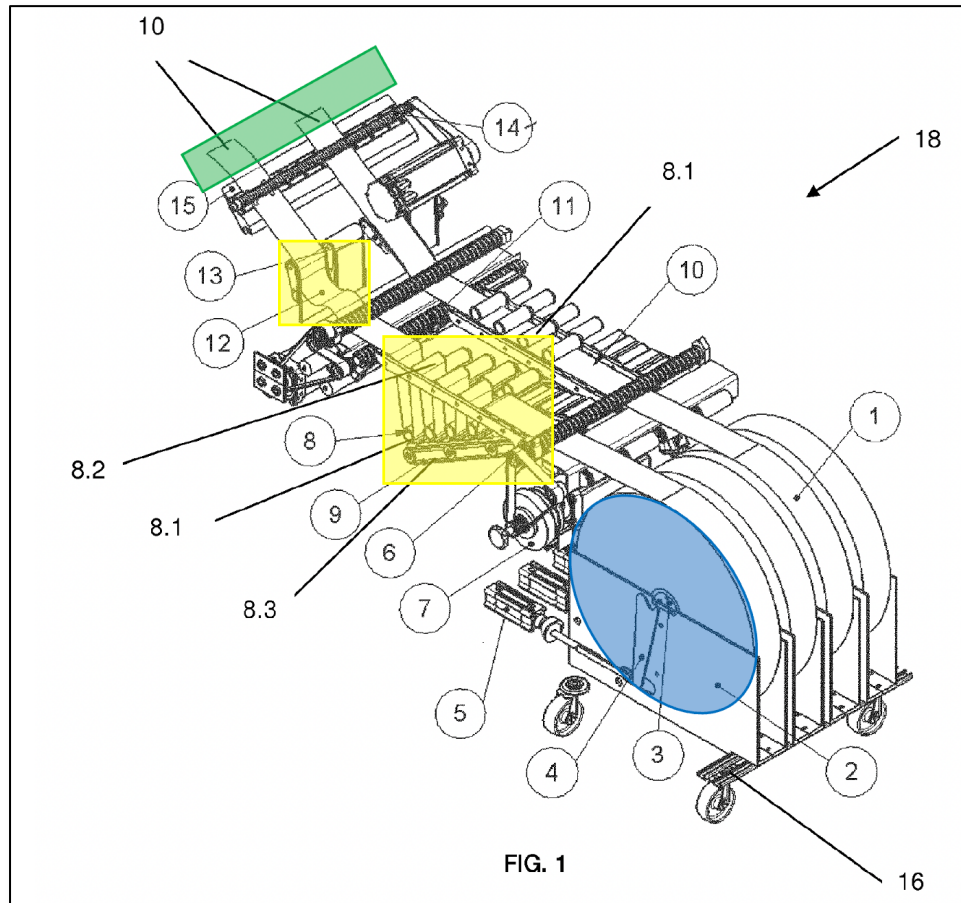
30. Petitioner's Ground 1 relies generally on combining Müller's and Waffner's teachings. Although Petitioner does not articulate its combination with sufficient particularity, Petitioner at least articulates that its proposed combination involves some modification of Müller's buffer 12 with Waffner's teachings related to its vacuum chamber. In doing so, Petitioner fails to account for the contrast in Müller's buffer 12—an intentionally small loop—with Waffner's loose loop vacuum chamber system. This oversight plagues Petitioner's obviousness theory because the small loop of buffer 12 is fundamentally incompatible with Waffner's multi-faceted vacuum chamber.

a) Müller's Buffering System Cannot Support Waffner's Vacuum System

31. Müller describes an unreeling system for interleaver material that is ultimately inserted between slices of food. *Müller*, [0002]. Müller's unreeling device is able to unreel a “plurality of interleaver reels[]” so that multiple lanes of material can be provided to the cutting region at the same time. *Id.* at [0007]. As the material moves through the unreeling system, it passes through two separate buffers, buffer

8 and buffer 12, each with different storage capacities. *Id.* at [0026]. By passing through buffers 8 and 12, damage to the interleaver material, such as tearing, is prevented. *Id.* A POSITA would have understood that the different storage capacities of these buffers allow each buffer to provide a distinct type of control to the interleaver system. Buffer 8 has a higher storage capacity and is therefore able to store more interleaver material. *Id.* Because of this, it is understood that buffer 8 is able to provide an initial “coarse” level of control to the interleaver system as the material is unreeled from the interleaver reel. Buffer 12 is downstream of buffer 8 and has a smaller storage capacity. *Id.* at [0048]. Because of the smaller storage capacity and buffer 8's upstream coarse control, buffer 12 is able to provide a finer level of control.

32. Annotated Fig. 1 below shows in yellow Müller's two buffers—large buffer 8 and the smaller tight loop buffer 12 arranged between the [paper roll](#) and [cutting region](#):



Id. at Fig. 1 (annotated).

33. As shown above, Müller's buffer 8 is the first buffer the interleaver material enters "after the interleaver strip has been unreeled from the reel." *Id.* at [0048]. Buffer 8 comprises "stationary rollers 8.2 and movable rollers 8.1 which, in the present case, are provided rotatably on a dancer 8.3." *Id.* These rollers contribute to the serpentine-like path that the interleaver strip runs through ultimately contributing to buffer 8 having a "higher storage capacity[.]" *Id.* at [0026], Fig. 1. On either side of buffer 8, there are independent drives 6 and 11 that drive the material as it enters and exits the buffer, respectively. *Id.* at [0048]. Dancer 8.3 in

buffer 8 “has a sensor with which one position thereof can be established, so that the signal from this sensor can be used to control the drive 6,7 of the respective interleaver reel.” *Id.* The components of buffer 8 operate in this manner to “compensate[] for a difference between unreeling speed and the consumption of the interleaver strip[.]” *Id.* at [0035].

34. Because the speed at which material is unreeled from the roll is often slower than the high acceleration required at the cutting region, buffer 8 serves to decouple the input speed from the output speed, preventing damage to the web by the storing material downstream from the input and upstream from the output. A POSITA would understand that Müller's buffer 8 achieves coarse loop control by decoupling the input and output speeds of the material within the interleaver apparatus. A POSITA would further understand that buffer 8 serves as the main decoupling mechanism for Müller's interleaver apparatus. This is because buffer 8 is the highest capacity buffer in Müller's interleaver system, and is, therefore, the main area where unreeled interleaver material can be stored in order to achieve decoupling of the input speed from the output speed.

35. After the material exits buffer 8, it enters Müller's buffer 12. *Id.* at [0048], Fig. 1. When the interleaver strip is in buffer 12, a small loop is formed, comprising substantially less material than the amount in buffer 8. *Id.* The length of the material loop formed in buffer 12 is monitored by a “contacting sensor.” *Id.* As

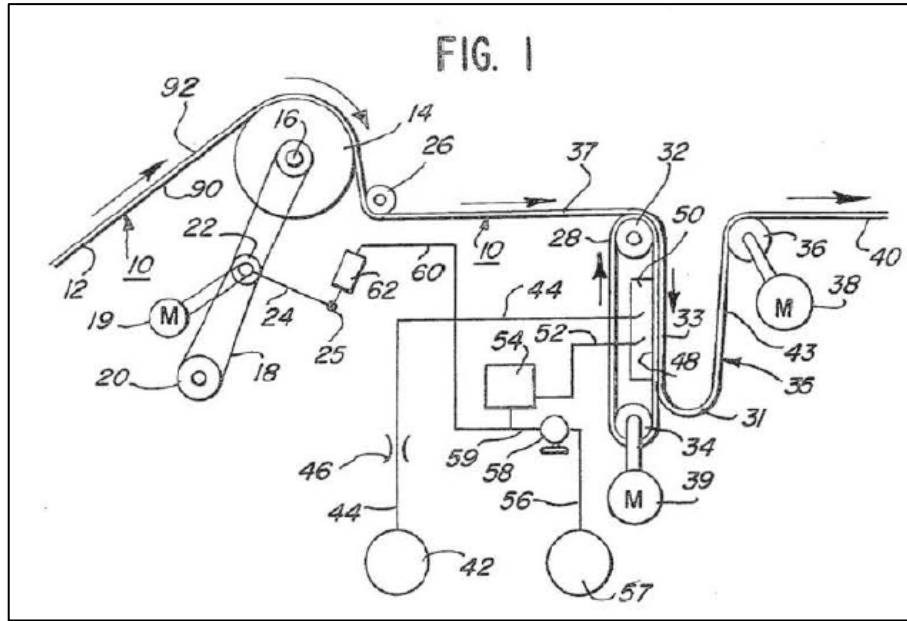
the material moves through buffer 12 it moves through an interleaver ejection unit 15 which an interleaver ejection roller 14 that provides the material to the cutting plane at a “very high acceleration.” *Id.* The operation of buffer 12 ensures that the material is buffered so that “only as much interleaver as is needed for the ejection of an interleaver.” *Id.*

36. Buffer 12 includes interleaver strip guide 13 which supports the loop and is “provided so as to be movable and which is able to enlarge or reduce the path of the interleaver strip.” *Id.* The interleaver strip guide 13 is pivotable between a “buffering position” and a “non-buffering position.” *Id.* The “buffering position” is a vertical position that allows the path of the interleaver strip to be lengthened. *Id.* at [0031], Fig. 1. The “non-buffering position” is a horizontal position that shortens the path of the interleaver strip that is particularly advantageous when “threading the interleaver strip.” *Id.*

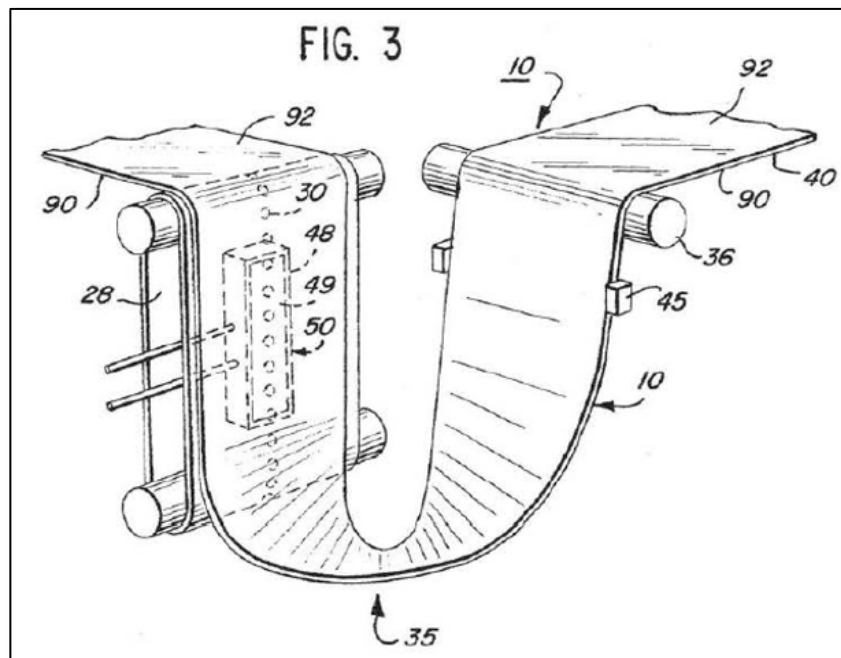
37. A POSITA would have understood that the lower capacity of buffer 12 indicates that this portion of *Müller*'s interleaver system achieves more fine-tuned control to provide the interleaver material to the cutting region at the accurate frequency. The smaller size of the loop in buffer 12 allows the material to travel less distance between ejections. As the interleaver material travels a shorter distance for each ejection, this material can be provided in an accurate and efficient manner to the cutting region and in between food slices. This smaller loop, with just enough

material for one ejection of interleaver material, is possible because it does not have to account for the slower, unreeling speed of the material. Buffer 8 accounts for the slow, unreeling speed upstream and allows material to be quickly provided to buffer 12, allowing buffer 12 to remain small, providing fine control to provide the interleaver material to the cutting region at the accurate frequency.

38. Petitioner generally argues that a POSITA would have been motivated to implement Waffner's vacuum chamber teachings in Müller's apparatus at buffer 12. *'013 Jobin Decl.*, ¶¶213, 217; *Jobin Depo. Tr.* (EX2009), 52:19-23 ("buffer 12 and the components in that area of Müller – I'm really talking about adding some of the teachings of Waffner to that component."); *See also '013 Petition*, pp. 33-34 (relying on Müller's buffer 12 as the loop store and strip guide 13 as the contact surface). Waffner's vacuum chamber includes numerous components that are required for the system to operate including vacuum chamber 50, longitudinal edges 48 and 49, vacuum line 44, restriction valve 46, vacuum line 44, and a vacuum source 42. *Waffner* ('013 EX1006), at 4:10-26. These components are depicted in Waffner's Figs. 1 and 3 below:



Waffner, Fig. 1.

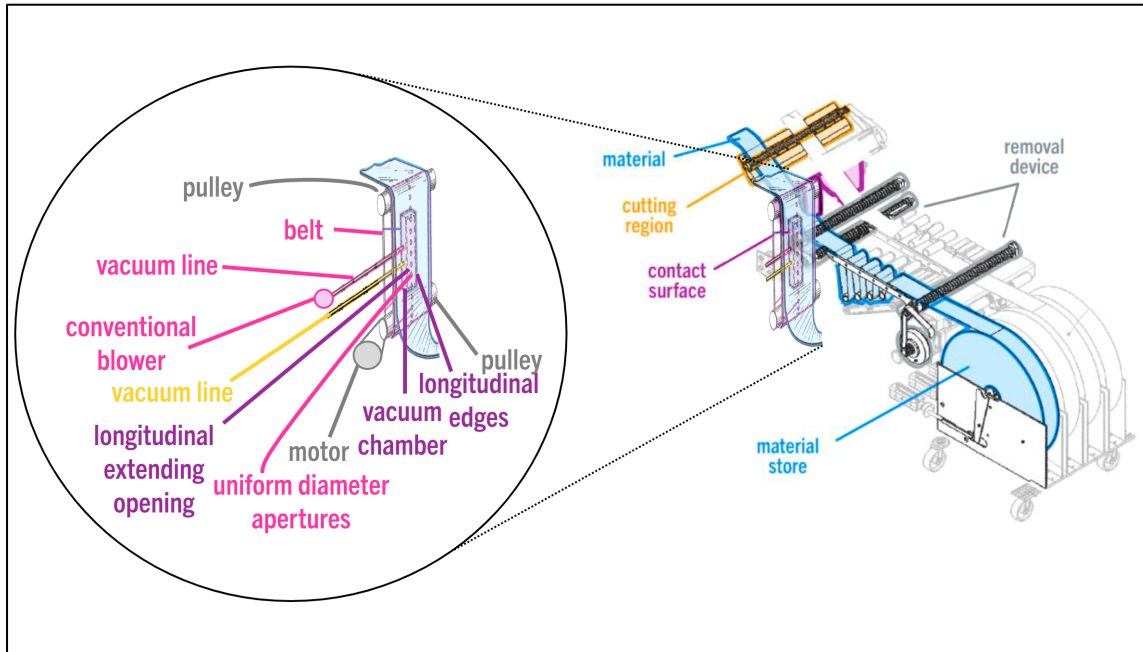


Waffner, Fig. 3. Petitioner's expert, Mr. Jobin, testified that components such as "a little chamber that is sealing the area behind the apertures" and "some type of sensor in there to detect either flow rate or pressure changes would need to be added." *Jobin*

Depo Tr. (Ex. 2009), 48:15-21. In addition to these components, an air-permeable surface would be required for the pressure sensor to function. Indeed, there must be airflow through the surface over which the material travels in order to detect a pressure that indicates loop length. When more apertures are exposed, airflow would increase and a shorter loop length would be indicated by a lower pressure as the material would no longer be covering as many surface apertures. Conversely, when less apertures are exposed, airflow would decrease and a longer loop length would be indicated by a higher pressure as the material would be covering more surface apertures on the air permeable surface.

39. A POSITA would understand that these required components associated with Waffner's vacuum chamber would not fit at Müller's buffer 12. As discussed previously, buffer 12 of Müller was designed to be a small, tight loop that is only ever provided "as much interleaver material as is needed for the ejection of an interleaver." *Müller*, [0048]. Buffer 12 of Müller was not designed to be a size that could accommodate components such as a vacuum chamber with longitudinal edges, vacuum lines, and a conventional blower, to name a few. Adding these components to buffer 12 would "crowd" the space that was designed to be relatively simple and small in size. Thus, the modifications and additional component requirements of a vacuum chamber would be incompatible with the nature of Müller's buffer 12 as a small loop buffer for fine loop control. As seen in the image

below, the potential modifications to Müller to incorporate Waffner's vacuum chamber teachings introduce significant complexity to buffer 12 in such a way that does not comport with Müller's apparatus. Thus, a POSITA would not have been motivated to combine Waffner's vacuum chamber teachings at least because it would be technically infeasible with the size and capacity of Müller's buffer 12. Müller's buffer 12 was designed to accommodate a small, low-capacity loop of material. By design, given the minimal area within which it resides, the area of buffer 12 is a simple, low complexity design. In the illustration below, I've shown that incorporating Waffner's vacuum system no longer allows buffer 12 to be of low capacity or complexity.



Müller, Fig. 1 (annotated); *Waffner*, Fig. 1 (same).

40. Waffner's vacuum system imposes substantially more complexity to Müller's system and would occupy far more real estate. Further, the nature of Waffner's vacuum-based system requires a much longer loop than that used at Müller's buffer 12. Müller's buffer 12 was not designed to accommodate the longer loop that would be needed for Waffner's vacuum-based system. Waffner's vacuum-based system assumes a length of material travels over a series of apertures that provide air flow into vacuum box 50. The pressure within vacuum box 50 changes as the loop length changes and the material covers more or fewer of these apertures. As illustrated in Waffner, this approach works only with a long loop in which the length of material changes significantly such that the pressure detected within box 50 changes a detectable amount.

41. Not only is Waffner technically incompatible, but its addition would also increase the Müller system's cost as well as increasing the cost of maintaining and installing the system. For example, a POSITA would not expect to have a readily available vacuum source in clean environments such as those Müller's system targets. When designing food processing lines, complexity is avoided as much as possible due to the cleaning procedures that must occur to maintain a safe environment. Implementing a vacuum chamber would increase the complexity and, therefore, increase the difficulty of cleaning said environment. Accordingly, in addition to the complexity illustrated above via the addition of Waffner's vacuum-

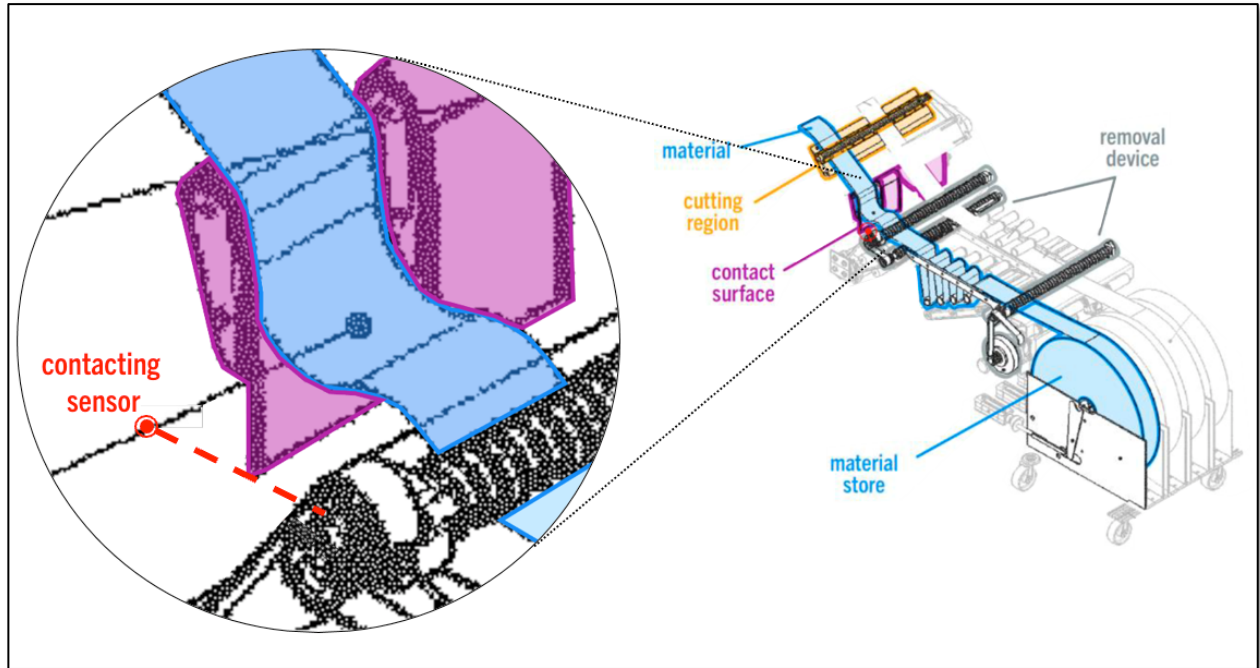
based system to Müller's apparatus, a POSITA would have understood that a system for generating the actual vacuum is also required. Given the cost, complexity, and incompatibility, a POSITA would not have been motivated to add Waffner's vacuum system to Müller's system.

b) Müller's "Contacting Sensor" Does Not Include a Pressure Sensor and Waffner Does Not Teach a Pressure Sensor

42. Müller teaches a "contacting sensor" used to monitor the length of the loop at buffer 12. *Mueller*, [0048]. A POSITA would understand Müller's contacting sensor detects whether the interleaver material is "contacting" the apparatus at a particular location (e.g., at the bottom of strip guide 13). By detecting whether (and potentially where) the interleaver material is making contact, a signal may be sent back to Müller's control system to cause a responsive signal to be sent to the drives to slow or speed up the rate at which material is removed from the roll to ensure the loop in buffer 12 is maintained at an appropriate length. A POSITA would further understand that Müller's "contacting sensor" would need to be small enough to fit within the space occupied by buffer 12. Implementing a "contacting sensor" that is small enough to fit within the space designed for and occupied by buffer 12 ensures that the loop length can be easily measured in the small region and that a small capacity loop is maintained. Indeed, having a contacting sensor fit in the designed

space of buffer 12 eliminates the need to modify buffer 12 to accommodate a different sensor that would require additional components for operation.

43. A POSITA would have understood there to be many types of available contacting sensors that would be compatible with Müller's buffer 12, including, for example, position sensors such as proximity sensors as well as photoelectric sensors (e.g., photocells). *Sensor Technology Handbook* (EX2008), 322. A POSITA would understand a photoelectric sensor to be one type of technically compatible contacting sensor with Müller's buffer 12. Typically, a photoelectric sensor would emit a beam of light from an emitter unit. *Id.* at 358. If there was nothing blocking the light, the light would be received by a receiver unit. *Id.* If a photoelectric sensor was used to detect the contact of a material loop, the loop would reach a certain length and block the beam of light from being received by the receiver thus detecting the presence of the loop. While using this sensor in the interleaver may come with some disadvantages, such as collecting dust or debris from machine, a POSITA would have understood that this problem could be solved with a simple engineering solution, such as plastic coverings that could be easily cleaned. As seen in the image below, the implementation of a photoelectric sensor (red) would be compatible with the size and function of Müller's interleaver strip guide 13 and buffer 12.



Müller, Fig. 1 (annotated)

44. A POSITA would understand that using a photoelectric sensor as Müller's "contacting sensor" in buffer 12, would require simple installation that would allow Müller's apparatus to operate exactly as designed. More specifically, utilizing a photoelectric sensor would facilitate detection of the contact of the material, sending of a signal to Müller's control system, and subsequently sending of a signal to drive 11 to speed up or slow down in order to maintain loop size in buffer 12. As demonstrated in the photo above, a photoelectric sensor could easily be placed just below the end of strip guide 13 (purple) to ensure appropriate control when and if the loop becomes too large as a result of underproduction on the cutting edge. Placing the photoelectric sensor here would further allow the movable and

pivoting functionality of strip guide 13 to be retained in accordance with Müller's teachings.

45. In contrast, a POSITA would not have understood a pressure sensor, to be a compatible "contacting sensor" as described in Müller. A POSITA would understand that a pressure sensor would not be contemplated by Müller at all due to the fact that Müller discloses no pneumatic components. For the additional reasons stated above regarding Waffner's vacuum chamber teachings, use of a pressure sensor would not be technically feasible in Müller's buffer 12 because an effective pressure sensor would require an entire vacuum chamber system. Thus, to employ a pressure sensor in Müller's system would implicate the same issues discussed above. *See supra* Section VI.A.2(a).

46. Beyond the broad incompatibility of pressure sensors with Müller's teachings, a POSITA reading Waffner would understand that Waffner does not contain any disclosure of a manometer pressure sensor. Rather, in controlling the size of the loop, Waffner utilizes only mechanical and pneumatic controls:

For example, *when the degree of the vacuum in the chamber 50 increases* (because the web outfeed speed has decreased with respect to the web infeed speed so as to lengthen the portion 33 of the loop 35 and cover more apertures 30 in the belt 28), *the change in the vacuum signal from the chamber 50 will cause the bellows 72 to more restrict the orifice 70. Such increased restriction will cause the air pressure in the conduits 59 and 60 to increase* since a similar volume of compressed air will be bled through the orifice 70. *When the air pressure in the conduits 59 and 60 increases, the piston 84 of the cylinder 62 will be forced outwardly against the bias of the spring 88.*

Such movement of the piston 84 ***causes the connecting rods 24 to move around the pivot 25 so as to change the position of the Verisheave sheave 22. This repositioning of the sheave 22 causes the speed of the pulley 16 and roller 14, and thus the infeed speed of the web 10, to be decreased*** so that the downwardly descending portion 33 of the loop 35 again shortens and exposes more of the apertures 30 in the belt 28.

Waffner, 5:61-6:13 (emphases added). In other words, Waffner's system directs the pressurized air through its system such that mechanical structures—bellows, pistons, springs, and sheaves—create a purely mechanical and pneumatic control feedback system to adjust the pulley and roller speeds. There is no “sensor,” electrical signal, or control system as these terms are commonly understood in the art. Consequently, even if a pressure sensor was contemplated as an appropriate “contacting sensor,” a POSITA would not have turned to Waffner because it simply does not contain any such sensor.

3. *Waffner is Redundant of Müller and Petitioner's Proposed Combination Offers No Benefit to Müller*

47. Beyond the fact that Müller's buffer 12 is technically incompatible with Waffner's teachings, a POSITA would not be motivated to combine Waffner's teachings with Müller because the alleged benefits are either (1) present in Müller's system alone, or (2) simply inapplicable to Müller's system altogether. For the reasons discussed in Section VI.A.2(a), a POSITA would understand Müller's buffer 12 to be a *small* loop used for fine loop control. *See supra* Section VI.A.2(a). A POSITA would further understand that Müller teaches buffer 8 for coarse loop

control. *Id.* at ¶¶31-34. In contrast, a POSITA would understand that Waffner, titled “Loose Loop Feed Control Apparatus,” uses a single large loose loop method as a form of loop control.

48. A POSITA would distinguish the buffering system disclosed in Müller from a large loose loop system. In contrast to Müller, loose loop systems achieve decoupling between inlet and outlet speeds via the loop itself and often implement vacuum chambers in order to maintain the loose loop and counter associated problems that arise from the nature of the loose loop. For example, U.S. Patent No. 3,310,249 to Bryer (“Bryer”) described a “variable loop length device for web transports, and more particularly to vacuum chamber systems[.]” *Bryer* (EX1009), 1:10-14. These vacuum chamber systems are used to maintain a loose loop in order to “mechanically isolate mechanisms having different acceleration and deceleration characteristics, such as capstans and reels.” *Id.* at 1:17-20. As a further example, U.S. Patent No. 2,921,753 to Lahti (“Lahti”) discloses a tape transport system which holds a slack loop in a vacuum column to ultimately control the movement of the material throughout the system. *Lahti* (EX1008), 1:15-19, 2:52-56. Lahti states, “Due to the inertia of the reeling system. . . it has been proposed that slack loops be interposed between the supply reel and the operational zone, and between the operational zone and the take-up reel.” *Id.* at 1:35-40. Lahti acknowledged that for a slack loop to control the “rate at which the supply reel unwinds the tape, and the rate

at which the take-up reel winds the tape,” the slack loop must be held at an optimum length with a mechanism such as a “vacuum column.” *See e.g., id.* at 1:45-52 (“Where slack loops are employed in a tape transport system, some means must be provided for controlling the rate at which the supply reel unwinds the tape, and the rate at which the take-up reel winds the tape, to keep the slack loops at an optimum length. One known method is to hold each of the slack loops in position in a separate vacuum column which is slightly evacuated below the tape.”).

49. A POSITA would understand that the components and operation of Waffner's pneumatic-based control apparatus are designed to ensure that a loose loop is maintained consistent with the state of the art. Waffner discloses a control apparatus for transporting paper or fragile sheeting from an input to an output through the formation of a “loose loop in between the inlet and the outlet” of the apparatus. *Waffner*, 1:6-10. The control apparatus aims to control the infeed and outfeed speeds of the web in order to “maintain a **loose** loop” using a pneumatic based, vacuum chamber system. *Id.* at 1:18-21 (emphasis added). As web material 10 enters the control apparatus, “[t]he web infeed speed is regulated by a variable speed feed roll 14.” *Id.* at 3:46-49. The speed of the pulley 16 is varied by “a conventional variable pitch sheave 22.” *Id.* at 3:51-54. The material web 10 then travels in the transporting direction and forms loop 35, with a descending portion 33 and an ascending portion 43. *Id.* at 3:67-4:4. The descending portion 33 of the loop

passes over “an endless belt 28 which is driven around pulleys 32 and 34.” *Id.* at 3:60-61. The endless belt 28 contains apertures 30 along the longitudinal center line that are air permeable. *Id.* at 3:61-64. The ascending portion 43 of the loop is downstream of the descending portion and is “carried by and passes over an outfeed roll 36.” *Id.* at 4:1-9. To ensure that loop 35 is maintained as a loose loop, the length of the loop is controlled by variations in the infeed speed as a result of pressure changes in the vacuum chamber. *Id.* at 5:55-60.

50. Müller, on the other hand, achieves decoupling in an entirely different manner than Waffner and other loose loop systems. *See supra* at Section VI.A.2(a). Consequently, the result of combining the teachings of Waffner with Müller’s buffer 12 would be redundancy in Müller’s overall system with no advantages. The purported benefits Petitioner relies on for its motivation to combine are either already present in Müller alone or are merely solving the problems that exist solely because of the proposed combination with a vacuum chamber. A POSITA would therefore not have been motivated to incorporate the teachings of Waffner in Müller’s buffer 12.

a) Müller Alone Teaches Ensuring Appropriate Loop Length and No Motivation Exists to Replace it with Waffner

51. Petitioner argues through its expert that a POSITA would be motivated to combine Waffner’s techniques with Müller “to ensure that an appropriate length

of loop is stored in Müller's buffer." *'013 Expert Decl.*, ¶207. However, Müller alone teaches ensuring an appropriate length of the loop in buffer 12. Müller's buffer 12 is "preferably monitored, in particular by a contacting sensor" in order to "buffer[] only as much interleaver material as is needed for the ejection of an interleaver." *Müller*, [0048]. As Mr. Jobin explains, "[a] POSA would understand that Müller's 'control system' accepts an input signal from the sensor and sends control signals to the drives (i.e. drive 11) to determine the length of paper in the loop ***in order to maintain the loop at this size.***" *Jobin '013 Decl.*, ¶176 (emphasis added). Thus, it is unclear why a POSITA would have been motivated to incorporate Waffner's teachings for the benefit of a functionality—ensuring appropriate loop length—that was already present in Müller. It's a straightforward design/engineering proposition that systems aren't changed when such changes have no functional or hardware benefits. Accordingly, absent any explanation or identification of benefits that compel modification, a POSITA would not be motivated to modify Müller with Waffner's teachings.

52. Petitioner argues that Waffner's method for determining the size of a loop offers "improvements" to Müller. *'013 Petition*, p. 40. However, beyond a couple conclusory statements, Petitioner has failed to articulate how or why Waffner's method for determining the size of a loop would improve Müller's method. Petitioner's expert similarly fails to provide any support for the broad

assertion that Waffner's method for determining the size of the loop is an improved version of Müller's. *See Jobin '013 Decl.*, ¶¶205-210. Petitioner appears to latch onto the characterization of Waffner as an "improved system" in Waffner's specification to suggest that Waffner would be an improvement to Müller. However, the phrasing of "improved" in Waffner's background, is completely isolated from a system like Müller's and simply couldn't have contemplated Müller in any way due to the fact that Waffner predated Müller by several decades. A POSITA would have understood Waffner's "improvements" to apply narrowly to large loose loop systems and not to Müller. As discussed above, Waffner's system is directed exclusively at a large loose loop system whereas Müller's buffer 12 is a small loop. Waffner explicitly identifies improvements within the context of loose webs explaining, "[m]eans to maintain a web with a desired *loose web* while operating under uniform tension has long been sought in the printing art, and many proposals have attempted to accomplish this." *Waffner*, 1:40-43. Müller was not faced with these problems because Müller does not attempt to maintain a loose loop. To the extent Petitioner argues that Waffner's method prevents against more damage to the web than Müller's method, it has provided zero support for such assertion.

b) Müller Would Not Benefit From "Additional Advantages of a Vacuum Chamber"

53. Beyond ensuring appropriate loop length—which Müller already does—the remainder of Petitioner's motivation to combine relies on a POSITA's

understanding that “Waffner’s contacting sensor could add other valuable features to Müller’s apparatus.” Petition at p. 40. Of these features, Petitioner highlights (1) improved threading; (2) tension control; and (3) loop stabilization. *’013 Petition*, pp. 40-41; *’013 Jobin Decl.*, ¶¶215-228. When looking at Müller as a whole, these touted benefits do not support a motivation to combine because such benefits are either already realized by Müller (and would not be further improved by Waffner’s teachings), or are wholly inapplicable to Müller altogether.

(1) *Adding a Vacuum System Would Not Improve Threading in Müller*

54. Both Petitioner and its expert admit that Müller already teaches reduced threading as a result of Müller’s design. *’013 Jobin Decl.*, ¶216 (“Müller teaches a number of improvements to ‘threading’ the new interleaver strip into the apparatus.”). Müller specifically highlights the improvement to threading it adds as a result of strip guide 13 being movable. Müller explains “interleaver strip guide is provided so as to be partially movable, in particular pivotable, so that the length thereof can be changed.” *Müller*, [0031]. The purpose of a pivotable strip guide is to allow the length of the guide to be shortened, during threading, and lengthened again. *Id.* A POSITA would understand the pivoting functionality of strip guide 13 to reduce threading time compared to a system in which the guide is not movable. Petitioner fails to articulate how and why adding a vacuum system to Müller’s strip guide 13 in buffer 12 would improve threading any more than Müller already does.

While Petitioner argues that the incorporation of a vacuum system would “eliminate the need for hand threading,” such assertion is unsupported. *'013 Jobin Decl.*, ¶217. When asked if Waffner's system required any threading, Mr. Jobin testified, “I don't recall it specifically talking about eliminating hand-threading...”. *Jobin Depo Tr.*, 55:13-20. A POSITA would understand that at most, having a vacuum system on the ascending side of the loop would impact threading only at that portion of the web handling device; however, hand threading would still be required at other portions of a web handling device. Implementing a vacuum chamber at the ascending side of the loop would not automatically thread the material through the first part of the machine. The user would still have to hand thread the interleaver material through this portion of the machine.

55. Further, because adding a vacuum chamber system to strip guide 13 in Müller would likely hinder the movement of the strip guide, it is likely that such combination would ultimately eliminate the benefit from Müller altogether rather than improve it. Lastly, given the small size of buffer 12, utilizing a vacuum chamber to hold the material in place as Petitioner suggests would not add the same benefit it otherwise would in a system like Waffner. A POSITA would understand that in a system with a vacuum chamber like Waffner's, the size of the contact surface before the cutting region is at a minimum large enough to accommodate an entire vacuum chamber and associated components. Thus, the total area that the interleaver material

must cover between threading points is much larger than it would be in a system like Müller's wherein the loop and strip guide have a smaller capacity. Given the small area covered by strip guide 13, there would be no benefit of "hold[ing] the interleaver material against the belt without the need for a corresponding clamp or roller." Thus, a POSITA would understand that adding Waffner's vacuum system teachings would not improve Müller's threading process.

(2) *Müller's Apparatus Teaches Sufficient Tension Control*

56. The value of utilizing a vacuum system for tension control does not exist within the context of a system like Müller's in which buffer 12 retains a small size with less interleaver material. For example, Mr. Jobin explains the need for loop control arises when there is "too much slackness" in a loose loop web handling system. '013 Jobin Decl., ¶220. Mr. Jobin describes a situation in which the loose loop, if under too low of tension, will "tend to flop and flutter." *Id.* Müller's small loop, on the other hand, is not subject to these same issues. As previously discussed, a POSITA would understand that Müller's loop is designed to have a smaller capacity, and thus regardless of not teaching a loose loop structure Müller teaches sufficient tension control. For Müller's buffer 12, sufficient tension would be required for it to operate in the manner described by Müller. Buffer 12 is designed so the interleaver material is under proper tension as it moves material to the cutting region. The tension on buffer 12 allows the material to move with ease and avoid

damage as it is provided to the cutting region and in between food slices. *See supra* Section VI.A.2(a).

57. Müller ensures that the interleaver material is buffered “only as much interleaver material as is needed for the ejection of an interleaver.” *Müller*, [0048]. Because the loop in buffer 12 is small, it is not prone to the same amount of disturbance that a larger loose loop would experience. A POSITA would understand that a smaller loop covering a shorter distance and containing less interleaver material, would inherently be subject to greater tension than a larger loop covering a longer distance and containing more interleaver material. Thus, a small loop, like Müller's, is not subject to the same “fluttering” or “flopping” described by Mr. Jobin when articulating the benefit of a vacuum system in tension control.

58. Petitioner further argues that a vacuum system would provide the benefit of braking the interleaver material to avoid an uncontrolled web that may travel out of a traditional loop store as the result of inertia caused by rapid deceleration at the cutting region. '013 *Jobin Decl.*, ¶¶221-22. Müller, however, is designed to prevent the very issue the vacuum brake is supposed to improve. Müller explains its interleaver reel is “braked automatically as soon as there is no need for the interleaver strip, for example when a product change is taking place in the cutting device.” *Mueller*, [0010]. More specifically, Müller avoids the need for braking on the ascending portion of the loop by including “deliberately so much friction that, in

the event of a consumption stop or a reduction in consumption of the interleaver strip, the reel overruns only so slightly that the excess can be s[t]ored in the buffer 8.” Thus, the issues of overrun inherent in a loose loop system that would otherwise be solved with a vacuum brake in the loop are specifically avoided in Müller. Müller is specifically designed buffer 8 so that the loop in buffer 12 does not need to be braked. Implementing a vacuum chamber in buffer 12 to brake the interleaver material would create redundancy that ultimately negates the design and purpose of Müller’s entire interleaver system. Not only are the benefits of braking not realized, but they are in contradiction to Müller’s teachings.

(3) *Müller’s Loop Would Not be Made More Stable with a Vacuum Chamber*

59. For the same reasons discussed in Section VI.A.3(b)(1), Müller’s buffer 12 would not realize the alleged improvements in stability of the web exiting the loop store due to the size and the design of Müller’s loop. Because “only as much interleaver as is needed for the ejection of an interleaver” is contained in the loop of buffer 12, a POSITA would understand that Müller would sufficiently protect against potential vibrations or twists resulting from the acceleration at the cutting edge. This is further evidenced by Müller confirming its apparatus is designed such that “it is possible to insert the interleaver strip into the cutting plane **with a very high acceleration.**” Müller, [0048] (emphasis added); *see also* [0052] (“the interleave[r] strip ejector roller is intermittently **subjected to very high**

acceleration”) (same), [0054] (“*high acceleration* is needed for the fast transport away of the portions.”) (same). A POSITA would understand Müller’s buffer 12, in light of these disclosures, to adequately overcome potential perturbances present in a loose loop system. As such, the benefits of loop stabilization would similarly not be realized in Müller.

A. Ground 2: Jordan and Fukuchi

1. Jordan Fails to Teach the Cutting Region Limitation

60. I have been asked to assume that the preambles of each independent Challenged Claim are limiting. Based on the language of these preambles, each independent Challenged Claim requires a “cutting region” in which (1) food product is sliced and (2) sheet material is cut. For example, independent claim 2 recites the following:

An apparatus for a single-track or multitrack provision of web-like interleaved sheet material at a cutting region in which products supplied on one track or on multiple tracks are cut into slices and interleaved sheets are introduced which are cut off from the provided interleaved sheet material in the cutting region, the apparatus comprising...

’013 Patent (EX1001), Claim 2 (emphases added). Similarly, independent claims 17 and 19 recite the following:

An apparatus for a single-track or multitrack slicing of food products having a product feed which supplies products to be sliced on one track or on multiple tracks to a cutting region in which a cutting blade moves in a rotating and/or revolving manner to cut the supplied products into slices, and having an apparatus for the provision of web-like interleaved

sheet material at the cutting region *in which the products supplied are cut into said slices and interleaved sheets* are introduced which *are cut* off from the provided interleaved sheet material *in the cutting region*, said apparatus comprising...

Id. at Claims 17, 19 (emphases added).

61. The Petition relies solely on Jordan to satisfy these “cutting region” limitations of the preambles. I disagree that Jordan teaches or renders obvious the claimed “cutting region.” As I discuss in detail below, Jordan describes a “sorting and stacking” apparatus that accepts pre-sliced food products, weighs the food slices, stacks slices of a correct weight, and interleaves paper in between the stacked slices. There is no food product slicing apparatus described in Jordan. Indeed, Jordan notes that its described system solves problems known to have plagued food cutting machines in the prior art such as irregular stacks and inconsistent food slice weights:

Hitherto stacks of food slices have been formed at a cutting machine. The individual slices fell one after the other on to a stacking surface in a random fashion. The stacks formed in this way were of irregular form. To overcome this[,] the invention provides a method of forming stacks of flexible food slices comprising feeding a series of flexible food slices in turn to the underside of a moving air permeable conveyor, attaching each slice in turn to the underside of the conveyor by vacuum, conveying each attached slice to a position over a stacking support, stopping said conveyor with said slice at said position, releasing the vacuum and forcibly releasing said slice to allow it to fall from the conveyor and form a stack on said stacking support. This method allows accurately defined stacks to be produced.

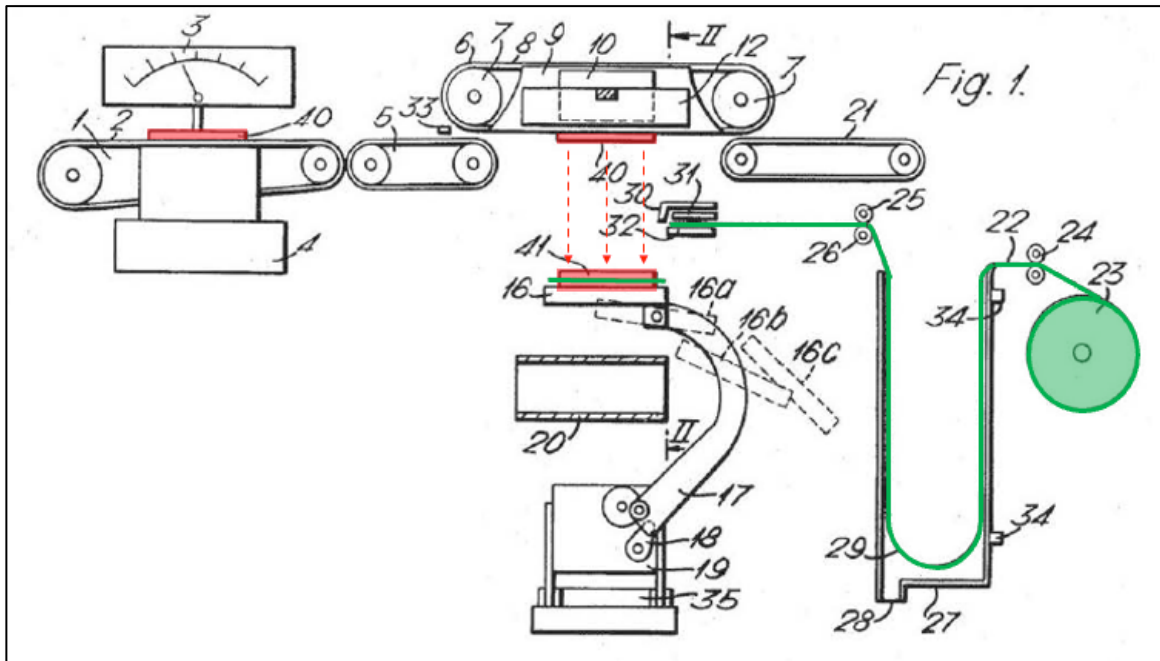
Jordan, 1:9-26.

A further problem was that the stacks were not uniform in weight. Resetting the cutting machine to correct the thickness of the slices or

the number of slices could not be done without a considerable loss of time. With foods such as cheese, sausage, ham, rock salmon etc. deviations occur fairly suddenly, however, in the dimensions of the pieces to be cut and in the consistency of the product. Portions from the ends of the pieces therefore frequently had to be repacked by hand. Sorting out the end pieces or pieces which broke off during cutting could not be done either without some work by hand. ***According to a further feature of the invention each slice is weighed before being attached to the conveyor and only slices of correct weight are released over said stacking support.*** Preferably slices of incorrect weight are conveyed beyond the position over said stacking support to a reject station and there released. Such weighing operations can be carried out with known electronic control devices with practically no restriction on the speed of the process, and can be used as a feedback control on the size of slices initially produced.

Id. at 1:27-48. In sum, Jordan seeks to avoid problems in the prior art by receiving pre-sliced food products and weighing, sorting, and stacking them separately from the cutting machine. At no point in Jordan's described process are food products and paper cut in the same region. Jordan assumes a separate system for slicing food products and is intentionally designed to weigh, sort, and stack the slices separately from the cutting machine.

62. Jordan's Fig. 1 below illustrates the main components of its described sorting and stacking apparatus:



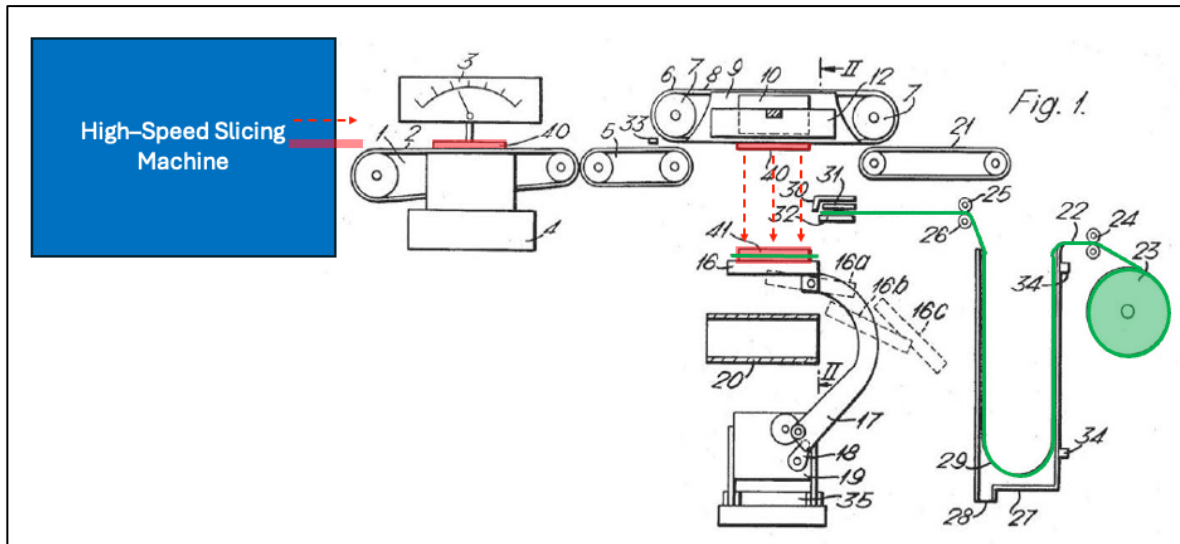
Id. at Fig. 1 (annotated to depict food product slices (red) and interleaved paper (green)). Jordan explains that food product slices “fall from a cutting apparatus (not illustrated) preferably first on to a weighing conveyer comprising a conveyer belt 2, an indicating instrument 3 and a weighing device 4[.]” *Id.* at 3:64-67. In other words, Jordan’s system begins by receiving pre-sliced food product from a separate and unillustrated food slicing/cutting apparatus. A POSITA would have understood that because the food slices “fall” from the food slicer/cutter to the weighing conveyer illustrated on the left of Fig. 1, that the food slicer/cutter assumed by Jordan’s system would be positioned to the left of the components illustrated in Fig. 1. After the weighing conveyer, food product slices are conveyed by conveyer 5. *Id.* at 4:1-2. When a “scanning device” detects a food slice approaching the right side of conveyer 5, conveying device 6 begins operating. *Id.* at 4:2-5. Conveying device 6 uses a

vacuum to hold the food product slice to its underside. *Id.* at 4:6-11. A slice of proper weight is conveyed over the product slice stack 41 and dropped by releasing the vacuum, while a slice of improper weight is passed along to belt 21. *Id.* at 4:11-21. When a slice is released to drop onto stack 41, the paper cutter 30 cuts off an individual sheet that is fed under the falling food product slice, serving to separate the food product slices comprising stack 41. *Id.* at 5:29-38.

63. I understand from the Petition and Mr. Jobin's analysis that they believe a POSITA reading Jordan in 2017—the priority date of the '013 Patent—would have understood Jordan to teach a “cutting region” where food product is sliced and where interleaved paper is cut because such “cutting region” arrangements were known as of 2017. I disagree. While it is certainly true that a POSITA would have recognized food processing systems advanced significantly in the 40+ years between Jordan's disclosure and 2017, Jordan describes a specific system designed to account for specific problems experienced in the field as of its disclosure in the early 1970s. Put simply, Jordan describes what it describes. A POSITA very likely would not have used a system as dated as Jordan's in 2017, as is the nature of technical advancements in the art of food processing. But I disagree that a POSITA reading Jordan in 2017 would have interpreted Jordan to *teach* features that were state of the art in 2017, particularly where Jordan does not describe such features and expressly

sought to separate weighing and stacking from the food product slicing/cutting process.

64. Mr. Jobin notes that “Jordan specifically describes ‘known high-speed slicing machines’” and observes that, “[a]t the time of the ’013 patent, the known high-speed slicing machines cut paper and product at the same cutting surface.” *’013 Jobin Decl.*, ¶424. From this, he concludes that “although Jordan literally discloses a “cutter 30” that only cuts paper (because product is sliced at a separate “cutting machine”), a POSA reading Jordan at the time of the patent would understand Jordan to disclose a known high-speed slicing machine where the paper cutter and food slicer were a common blade at a common cutting region.” I disagree. Jordan’s full statement is, “[t]he apparatus according to the invention can be combined with known high-speed slicing machines and automatic packaging machines.” *Jordan*, 6:14-18. As I note above, a POSITA would have understood that that Jordan’s system receives slices of food product from an un-illustrated and undescribed cutting device, which I would expect to be located at the far left of Figure 1 as depicted below:

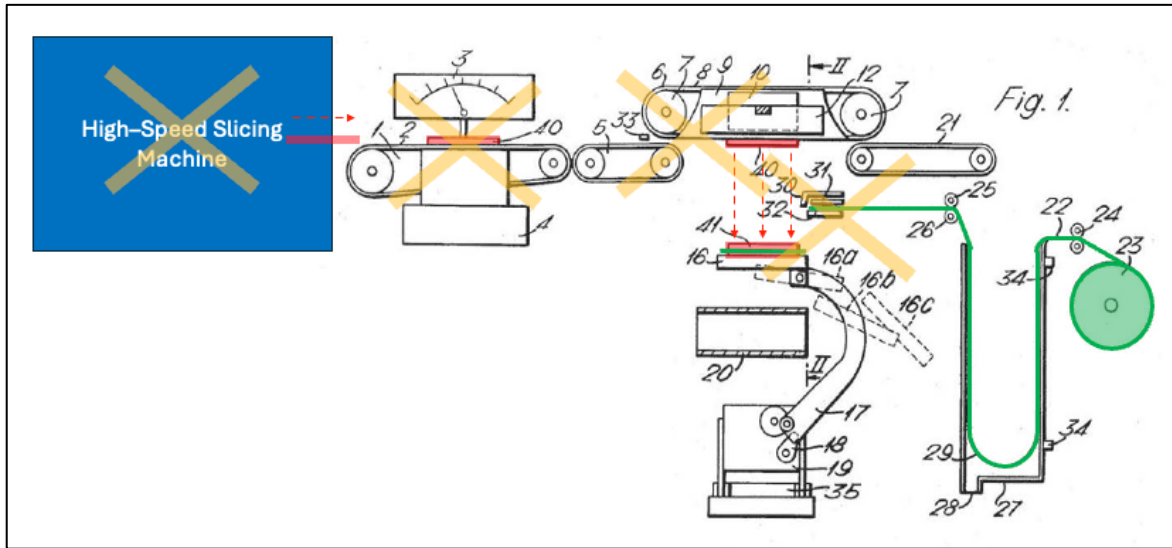


My expectation regarding the location of the slicing machine in Jordan is based, as noted above, on Jordan's teaching that sliced food products are received on weighing conveyor 1 from the slicing machine. *Id.* at 3:64-67. As illustrated, a POSITA would have understood that "combining" Jordan's system with known high-speed slicing machines" simply means that the slicing machine used to feed sliced food product to weigh conveyor 1 may operate at high speeds. Consistent with this teaching, I have labeled the slicing machine above as a "high-speed slicing machine." Consistent with this interpretation, Jordan expressly teaches that "[t]he principal features of the invention related to conveying the slices [and] forming the stacks . . . preferably at a high speed." *Id.* at 1:49-52. Accordingly, I disagree with Mr. Jobin that Jordan intended its system to be completely replaced by whatever modern high-speed slicing systems may exist at some later date. Instead, Jordan's reference to high-speed slicing is simply noting that Jordan's stacking and interleaving system

can operate at high speeds and support receiving food product slices from a high-speed slicing machine.

65. Mr. Jobin never explains what modifications to Jordan would be required were Jordan to incorporate a “cutting region” where food product is sliced and interleaved paper sheets are cut. In fact, the modifications would be substantial. Were Jordan's system modified to slice food product and cut interleaved paper in the same region, little of Jordan's system would remain because little of it is capable of supporting such a modern approach to slicing food product and cutting interleaved material together. As illustrated in Jordan's Fig. 1, there is no infrastructure capable of delivering uncut food product to the region in which Jordan's paper cutter operates, so an entirely new food conveyance apparatus would be required. This would also serve to render moot any role for the separate high-speed slicing device Jordan suggests would be positioned to the left of Fig. 1. Similarly, there is no cutting apparatus large enough to cut food product at the same time as Jordan's paper, so Jordan's native paper cutter would be replaced. Finally, Jordan's weigh conveyer 1 would serve no purpose upstream of the cutting region because it is designed to weigh food product slices, which would not exist upstream of the cutting region if Jordan were modified to slice food product and cut paper in the same region. In sum, nearly the entire structure and function of Jordan's system would be disregarded

were Jordan's system modified to slice food product and cut paper in the same cutting region:



In the above annotated Fig. 1, I have indicated with orange Xs, which components in Jordan's system would be replaced were Jordan modified with a cutting region consistent with the Challenged Claims' preambles.

VII. PETITIONER'S PROPOSED GROUNDS DO NOT RENDER OBVIOUS THE CHALLENGED CLAIMS OF THE '823 PATENT

A. Ground 1: Petitioner's Proposed Combination of Müller and GEA438 Fails for Several Reasons

1. *Petitioner Fails to Explain with Particularity the Proposed Combination*

66. The same insufficiencies in Petitioner's proposed combination with Waffner apply with respect to its proposed combination with GEA438. *See supra* Section VI.A.1. There is no specific description of how Müller and GEA438 are to be combined. From the vague description in the Petition and Mr. Jobin's supporting

declaration, I cannot ascertain which specific components from GEA438 are intended to be incorporated into the Müller or specifically how these systems are proposed to work together. In the below sections, I have analyzed the Müller and GEA438 disclosures and have identified (1) technical incompatibilities between these systems and (2) reasons no POSITA would have been motivated to combine their teachings. My discussion of these references and their hypothetical combination should not be interpreted to mean that I believe Petitioner has described a concrete and specific combination of their teachings. Nor should my analysis be interpreted as capturing all reasons why Müller and GEA438 fail to render the Challenged Claims obvious. Were Petitioner and its expert to identify a concrete and specific combination of these references, there may be additional reasons a POSITA would not have made that combination.

2. Müller is Technically Incompatible with GEA438's Vacuum System Teachings

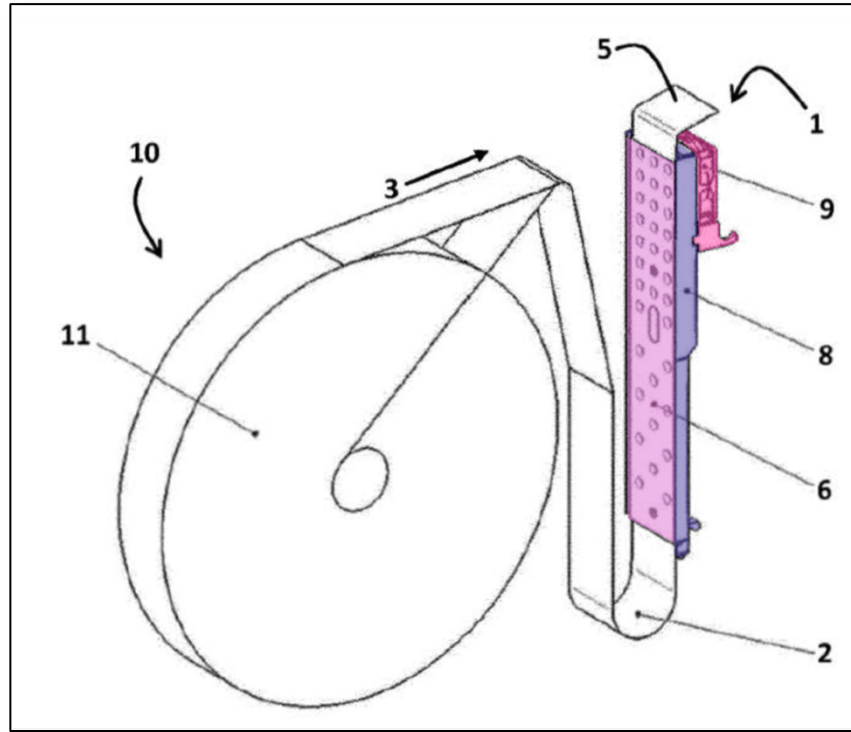
67. Petitioner's Ground 1 relies generally on combining Müller's and GEA438's teachings. Although Petitioner does not articulate its combination with sufficient particularity, Petitioner at least articulates that its proposed combination involves some modification of Müller's buffer 12 with GEA438's teachings related to its vacuum brake. In doing so, Petitioner fails to account for the contrast in Müller's buffer 12 as an intentionally small loop with GEA438's vacuum chamber system that lacks any loop at all. This oversight plagues Petitioner's obviousness

theory because the small loop of buffer 12 is fundamentally incompatible with GEA438's multi-faceted vacuum system.

a) Müller's Buffering System Cannot Support GEA438's Vacuum System

68. I discuss the details of Müller's buffer system above in paragraphs 31-37.

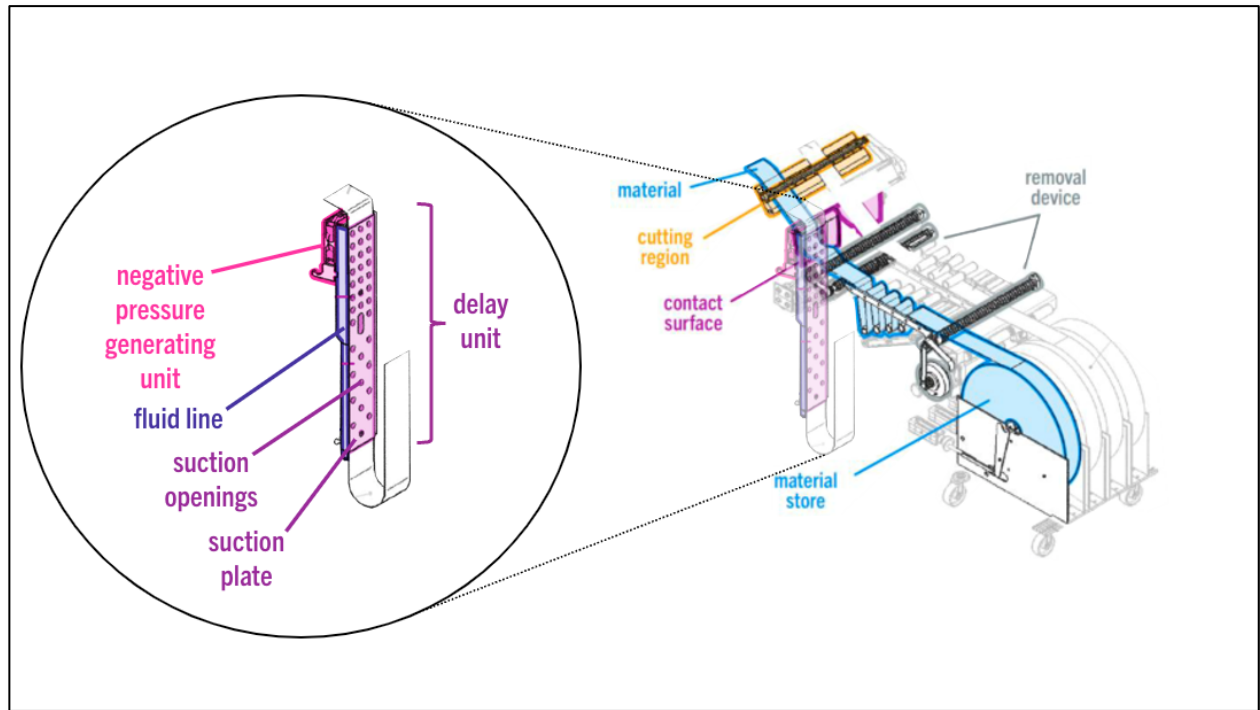
69. Petitioner generally argues that a POSITA would have been motivated to implement GEA438's vacuum brake teachings in Müller's apparatus at strip guide 13 of buffer 12. *'823 Jobin Decl.*, ¶190; *See also '823 Petition* at p. 34. GEA438's vacuum brake includes numerous components that are required for the system to operate including a suction plate 6, fluid line 8, and a negative pressure generating unit 9. *GEA438*, [0031]. These components are depicted in GEA438's Figure 3 below:



Id. at Fig. 1 (annotated). Petitioner's expert, Mr. Jobin, testified that the parts of GEA438's vacuum chamber include "the suction plate and the holes and the vacuum-generating unit and the vacuum chamber itself." *Jobin Dep. Tr.* (EX2009), 85:9-12. In addition to these components, an air-permeable surface would be required for the pressure sensor to function. Indeed, there must be air flow through the surface over which the material travels in order to detect a pressure that indicates loop length. When more apertures are exposed, airflow would increase and a shorter loop length would be indicated by a lower pressure as the material would no longer be covering as many surface apertures. Conversely, when less apertures are exposed, airflow would decrease and a longer loop length would be indicated by a higher

pressure as the material would be covering more surface apertures on the air permeable surface.

70. A POSITA would understand that these required components associated with GEA438's vacuum brake would not fit at Müller's buffer 12. As discussed previously, buffer 12 of Müller was designed to be a small, tight loop that only ever provided "as much interleaver material as is needed for the ejection of an interleaver." *Müller*, [0048]. The modifications and additional component requirements of a vacuum chamber would be incompatible with the nature of *Müller's* buffer 12 as a small loop buffer for fine loop control. As seen in the image below, the potential modifications to Müller to incorporate GEA438's vacuum brake teachings introduce significant complexity of buffer 12 in such a way that does not comport with Müller's apparatus. Thus, a POSITA would not have been motivated to combine GEA438's vacuum brake teachings at least because it would be technically infeasible with the size and capacity of Müller's buffer 12.



Id. at Fig. 1 (annotated); *GEA438*, Fig. 3 (same).

71. *GEA438*'s vacuum systems imposes substantially more complexity to Müller's system and would occupy far more real estate. Further, the nature of *GEA438*'s vacuum-based system requires a much longer supply of interleaver material than that used at Müller's buffer 12. As shown in the figure above, *GEA438*'s vacuum-based system assumes a length of material travels over a significant distance with a series of apertures that provide air flow delay unit 1. The length of the suction plate is required to provide the braking force disclosed in *GEA438*. If only a small portion of the material contacted *GEA438*'s suction plate, there would not be enough suction force to overcome the inertia of the roll.

72. Not only is GEA438 technically incompatible, but its addition would increase Müller system's cost as well as increasing the cost of maintaining and installing the system. For example, a POSITA would not expect to have a readily available vacuum source in clean environments such as those Müller's system targets. When designing food processing lines, complexity is avoided as much as possible due to the cleaning procedures that must occur to maintain a safe environment. Implementing a vacuum chamber would increase the complexity and, therefore, increase the difficulty of cleaning said environment. Accordingly, in addition to the complexity illustrated above via the addition of GEA438's vacuum-based system to Müller's apparatus, a POSITA would have understood that a system for generating the actual vacuum is also required. If a system for generating the vacuum is not present in the environment where Müller is being installed, a system for generating the vacuum would need to be installed. This would additionally increase the complexity of the installation and operation of Müller's interleaver system. Given the cost, complexity, and incompatibility, a POSITA would not have been motivated to add GEA438's vacuum system to Müller's system.

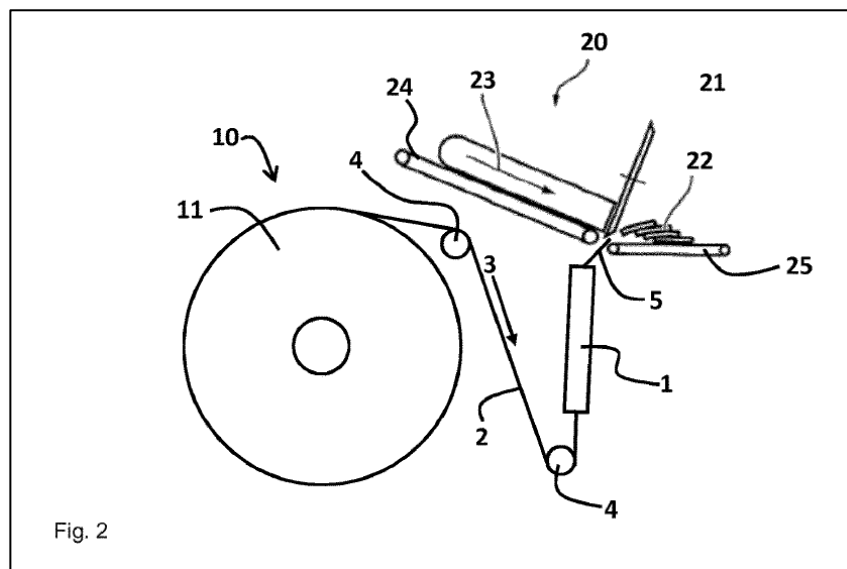
*3. GEA438 is Redundant of Müller and Petitioner's
Proposed Combination Offers No Benefit to Müller*

73. Beyond the fact that Müller's buffer 12 is technically incompatible with GEA438's teachings, a POSITA would not be motivated to combine GEA438's teachings with Müller because the alleged benefits are either (1) present in Müller's

system alone, or (2) simply inapplicable to Müller's system altogether. For the reasons discussed in Section VI.A.2(a), a POSITA would understand Müller's buffer 12 to be a *small* loop used for fine loop control. *See supra* Section VI.A.2(a). A POSITA would further understand that Müller teaches buffer 8 for coarse loop control. *Id.* at ¶¶31-34. In contrast, a POSITA would understand that GEA438 does not disclose any type of dynamic loop control of the interleaver material.

74. A POSITA would distinguish the buffering system disclosed in Müller from a system without any dynamic loop control. In contrast to Müller, a non-dynamic system absent any loop-based buffer does not achieve decoupling between inlet and outlet speeds via the loop itself nor by adjusting the length of said loop. A POSITA would understand that based on GEA438's functionality and structure, it does not disclose dynamic loop control. GEA438's pneumatic-based apparatus is designed so "only that much separating material 2 is unrolled from the tape roll 11 as is required by the cutting machine 20 for disposal between the foodstuff slices 22." *GEA438*, [0031]. GEA438 states, "the tape roll 11 is at all times tensioned" to ensure that no kinks, tears, or backup are formed. *Id.* This also ensures that the tape does not jump from the tape roll or the deflection rollers 4. *Id.* This is demonstrated in GEA438's Fig. 2 as the material is tensioned to the deflection roller 4 and then introduced to the delay unit 1. A POSITA would understand this deflection roller does not allow the material to change and lengthen dynamically. Instead, the material

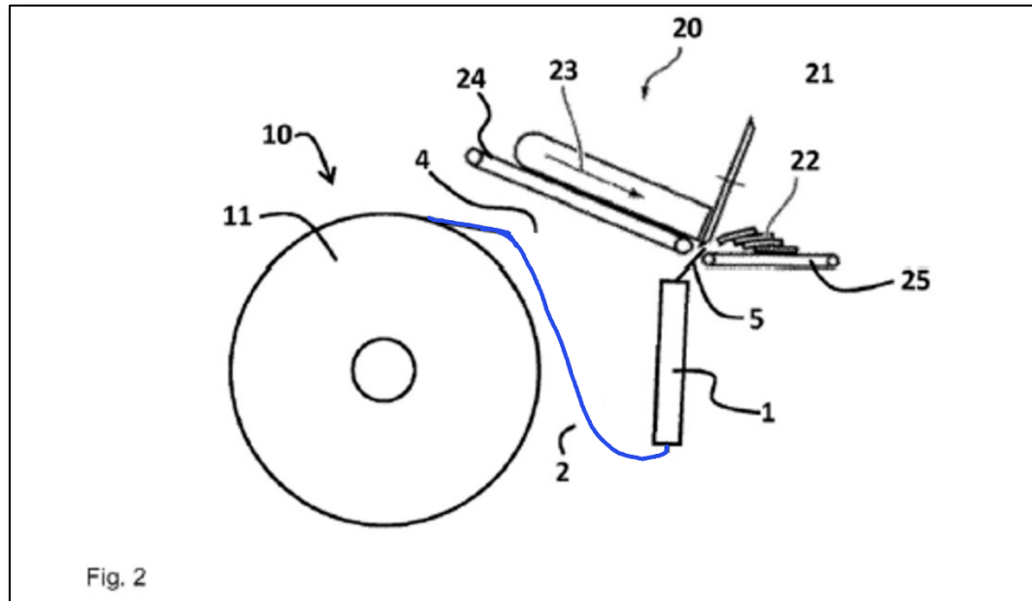
would wrap around the deflection roller 4 at the bottom of the material store. Since the deflection roller does not move up and down, the length of the material will remain constant as it passes under the roller and moves up into the delay unit 1. The deflection roller maintains the constant length of the material as it descends and then ascends into the delay unit, so the length of the material is not dynamically changing during the operation of GEA438's apparatus.



Id. at Fig. 2

75. GEA438's Fig. 1 does not demonstrate the presence of the deflection roller 4. However, even without the presence of the deflection rollers, a POSITA would understand GEA438's system would still not teach dynamic loop control. The delay unit of GEA438 is designed in a manner so that "the separating material and in particular the tape remains tensioned[.]" *Id.* at [0010]. Because the delay unit tensions the material to specifically avoid "backing up" (i.e., "forming a loop"), the

material would not be dynamically controlled even without the presence of the deflection rollers 4. It is represented in annotated Fig. 1 below, how the tensioned material would move directly from the tape roll to the delay unit without dynamic lengthening.



Id. at Fig. 2 (annotated). Therefore, the length of the material tape is not dynamically changing in GEA438's system.

76. Furthermore, as the material tape of GEA438's system is not dynamically changing, a POSITA would understand that GEA438 does not decouple the material store and the interleaver material with dynamic loop control. GEA438 does not describe sensing the length of the material or adjusting the length of the material. Rather, GEA438's system is controlled by a control unit that is "configured in such a manner that the rotating speed of the fan is controlled as a function of an

unrolling and/or transporting speed of the separating material.” *Id.* at [0012]. GEA438 describes that the “unrolling and/or transporting speed of the separating material” is measured by a sensor. *Id.* The measured speed of the unrolling of the material is a “regulating” or “feedback” variable and is “automatically maintained in a predefined nominal range.” *Id.* When the actual speed of the unrolling of the material is sensed to no longer be in the preset nominal range, the rotating speed of the fan is adjusted until the unrolling speed falls within the nominal range. *Id.* The rotating speed of the fan wheel is adjusted and determined from the “rotating speed of the electric motor by way of the shaft” which is controlled via a control unit. *Id.* Thus GEA438’s control system is independent of any characteristics of the material between the material roll and the delay unit 1.

77. Müller, on the other hand, achieves decoupling with coarse and fine control with buffers 8 and 12, respectively. Further, Müller uses dynamic loop control. *See supra* at ¶¶31-37. Consequently, the result of combining the teachings of GEA438 with Müller’s buffer 12 would be an unnecessary and complicating step in Müller’s overall system with no advantages. The purported benefits Petitioner relies on for its motivation to combine are either already present in Müller alone or are merely solving the problems that exist solely because of the proposed combination with a vacuum brake. A POSITA would therefore not have been motivated to incorporate the teachings of GEA438 in Müller’s buffer 12.

a) Müller Alone Teaches Ensuring Appropriate Loop Length and No Motivation Exists to Modify it with GEA438

78. Petitioner argues through its expert that a POSITA would be motivated to combine GEA438 techniques with Müller “to ensure that an appropriate length of loop is stored in Müller’s buffer.” ’823 *Jobin Decl.*, ¶185. However, as discussed above Müller alone teaches ensuring an appropriate length of the loop in buffer 12. *Supra* Section VI.A.3(a). Further, GEA438 does not describe sensing the length of the material or adjusting the length of the material. Rather, GEA438’s system operates such that the “rotating speed of the fan is controlled as a function of an unrolling and/or transporting speed of the separating material.” *GEA438*, [0012]. A POSITA would understand that there is no loop length determination involved in GEA438’s control unit. *See supra* at ¶¶VII.A.2(a). Thus, it is unclear why a POSITA would have been motivated to incorporate GEA438’s teachings for the benefit of a functionality—determining and ensuring appropriate loop length—that was already present in Müller, and not present in GEA438 whatsoever. It’s a straightforward design/engineering proposition that systems aren’t changed when such changes have no functional or hardware benefits. Accordingly, absent any explanation or identification of benefits that compel modification, a POSITA would not be motivated to modify Müller with GEA438’s teachings.

b) Müller Would Not Benefit From “Additional Advantages of a Vacuum Brake”

79. The remainder of Petitioner's motivation to combine relies on a POSITA's general awareness “of advantages to adding a vacuum brake to Müller.” '823 *Petition*, p. 33. Mr. Jobin's declaration sets forth a nearly identical motion to combine to the '013 Ground 1 discussed above, highlighting (1) improved threading; (2) tension control; and (3) loop stabilization. '823 *Jobin Decl.*, ¶¶215-228. Because these arguments are substantively identical to those addressed above in Sections VI.A.3(b)(1)-(3), my opinions apply equally to the combination of Müller with GEA438. Looking at Müller as a whole, the touted benefits of a vacuum brake do not support a motivation to combine because such benefits are either already realized by Müller (and would not be further improved by GEA438's teachings), or are wholly inapplicable to Müller altogether. *Id.* at ¶¶53-59

B. Ground 2: Petitioner's Proposed Combination of Müller and DePoi Fails for Several Reasons

1. Petitioner Fails to Explain with Particularity the Proposed Combination

80. The same insufficiencies in Petitioner's proposed combination with Waffner apply with respect to its proposed combination with DePoi. *See supra* Section VI.A.2(a). There is no specific description of how Müller and DePoi are to be combined. From the vague description in the Petition and Mr. Jobin's supporting declaration, I cannot ascertain which specific components from DePoi are intended

to be incorporated into the Müller or specifically how these systems are proposed to work together. In the below sections, I have analyzed the Müller and DePoi disclosures and have identified (1) technical incompatibilities between these systems and (2) reasons no POSITA would have been motivated to combine their teachings. My discussion of these references and their hypothetical combination should not be interpreted to mean that I believe Petitioner has described a concrete and specific combination of their teachings. Nor should my analysis be interpreted as capturing all reasons why Müller and DePoi fail to render the Challenged Claims obvious. Were Petitioner and its expert to identify a concrete and specific combination of these references, there may be additional reasons a POSITA would not have made that combination.

2. Müller is Technically Incompatible with DePoi's Double Vacuum System

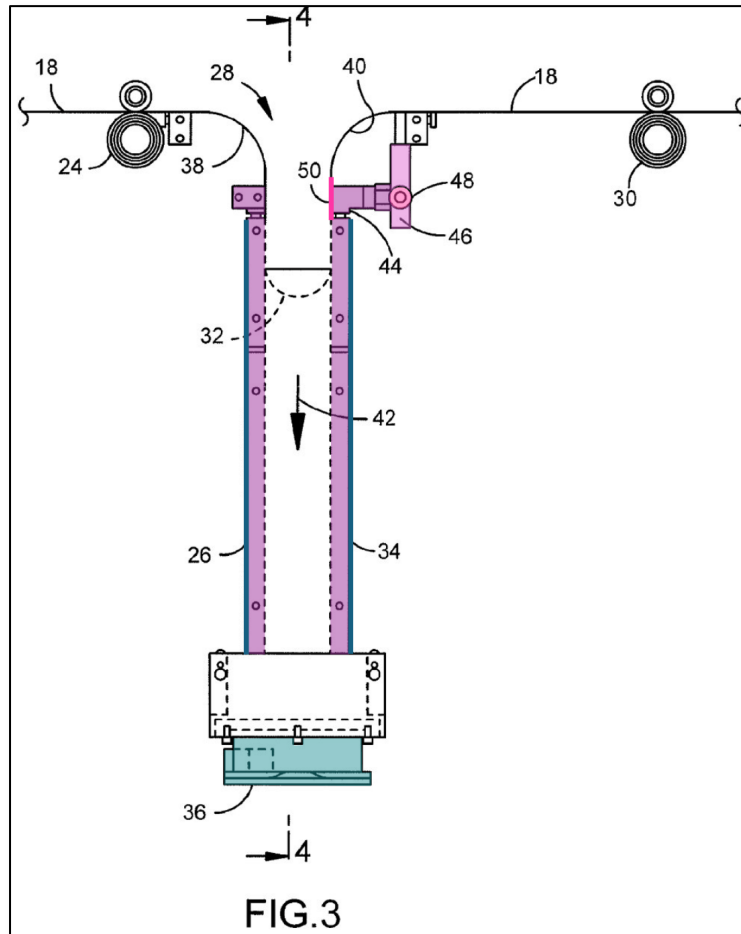
81. Petitioner's Ground 2 relies generally on combining Müller's and DePoi's teachings. Although Petitioner does not articulate its combination with sufficient particularity, Petitioner at least articulates that its proposed combination involves some modification of Müller's buffer 12 with DePoi's teachings related to its vacuum brake. In doing so, Petitioner fails to account for the contrast in Müller's buffer 12 as an intentionally small loop with DePoi's complicated dual vacuum chamber system. This oversight plagues Petitioner's obviousness theory because the

small loop of buffer 12 is fundamentally incompatible with DePoi's multi-faceted, double vacuum chamber system.

a) Müller's Buffering System Cannot Support DePoi's Vacuum System

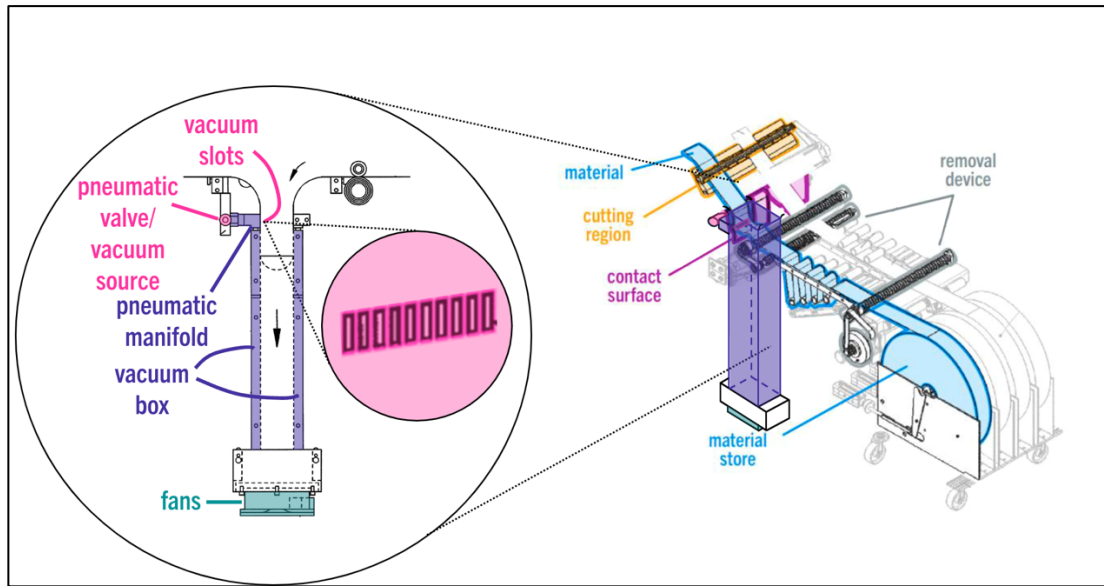
82. I discuss the details of Müller's buffer system above in paragraphs 31-37.

83. Petitioner generally argues that a POSITA would have been motivated to implement DePoi's vacuum brake teachings in Müller's apparatus at strip guide 13 of buffer 12. '823 *Jobin Decl.* ¶335; *See also* '823 *Petition*, p. 56. DePoi teaches two separate vacuum systems in vacuum box 50. The entirety of DePoi's system includes numerous components that are required for the system to operate such as vacuum box 26 with frame 34 and fans 36 in the base. *DePoi*, [0027]. The second vacuum system, brake 28, would additionally be required which comprises pneumatic manifold 44, a pneumatic valve 46, a vacuum source 48, and vacuum slots 50. *Id.* at [0029]. These components are depicted in DePoi's Fig. 3 below:



Id. at Fig. 3 (annotated). In addition to these components, an air-permeable surface would be required for the pressure sensor to function. Indeed, there must be air flow through the surface over which the material travels in order to detect a pressure that indicates loop length. When more apertures are exposed, airflow would increase and a shorter loop length would be indicated by a lower pressure as the material would no longer be covering as many surface apertures. Conversely, when less apertures are exposed, airflow would decrease and a longer loop length would be indicated by a higher pressure as the material would be covering more surface apertures on the air permeable surface.

84. A POSITA would understand that these required components associated with DePoi's vacuum brake would not fit at Müller's buffer 12. As discussed previously, buffer 12 of Müller was designed to be a small, tight loop that only ever provided "as much interleaver material as is needed for the ejection of an interleaver." *Müller*, [0048]. Buffer 12 of Müller was not designed to be a size that could accommodate components such as a vacuum chamber. Adding these components to buffer 12 would "crowd" the space that was designed to be relatively simple and small in size. Thus, the modifications and additional component requirements of a vacuum system would be incompatible with the nature of *Müller's* buffer 12 as a small loop buffer for fine loop control. As seen in the image below, the potential modifications to Müller to incorporate DePoi's vacuum brake teachings introduce significant complexity of buffer 12 in such a way that does not comport with Müller's apparatus. Thus, a POSITA would not have been motivated to combine DePoi's vacuum brake teachings at least because it would be technically infeasible with the size and capacity of Müller's buffer 12. Müller's buffer 12 was designed to accommodate a small, low-capacity loop of material. By design, given the minimal area within which it resides, the area of buffer 12 is a simple, low complexity design. In the illustration below, I've shown that incorporating DePoi's vacuum system no longer allows buffer 12 to be of low capacity or complexity.



Müller, Fig. 1 (annotated); *Depoi*, Fig. 3 (same).

85. DePoi's vacuum systems impose substantially more complexity to Müller's system and would occupy far more real estate. Further, the nature of DePoi's vacuum-based system requires a larger material store to accommodate for the use of two vacuum systems than that used of Müller's buffer 12. DePoi's vacuum-based system assumes a length of material travels to the bottom of the vacuum box due to the fans 36 at the bottom of the vacuum box, and then has to travel an increased ascending length to reach brake 28 and exit the vacuum box.

86. Not only is DePoi technically incompatible, but its addition would also increase the Müller system's cost as well as increasing the cost of maintaining and installing the system. For example, a POSITA would not expect to have a readily available vacuum source in clean environments such as those Müller's system targets. When designing food processing lines, complexity is avoided as much as

possible due to the cleaning procedures that must occur to maintain a safe environment. Implementing a vacuum chamber would increase the complexity and, therefore, increase the difficulty of cleaning said environment. Accordingly, in addition to the complexity illustrated above via the addition of DePoi's vacuum-based system to Müller's apparatus, a POSITA would have understood that a system for generating the actual vacuum is also required. This would additionally increase the complexity of the installation and operation of Müller's interleaver system. Given the cost, complexity, and incompatibility, a POSITA would not have been motivated to add DePoi's vacuum system to Müller's system.

3. DePoi is Redundant of Müller and Petitioner's Proposed Combination Offers No Benefit to Müller

87. Beyond the fact that Müller's buffer 12 is technically incompatible with DePoi's teachings, a POSITA would not be motivated to combine DePoi's teachings with Müller because the alleged benefits are either (1) present in Müller's system alone, or (2) simply inapplicable to Müller's system altogether. For the reasons discussed in Section VI.A.2(a), a POSITA would understand Müller's buffer 12 to be a *small* loop used for fine loop control. *See supra* Section VI.A.2(a). A POSITA would further understand that Müller teaches buffer 8 for coarse loop control. *Supra* at ¶¶31-34. In contrast, a POSITA would understand that DePoi engages buffering through an all-encompassing vacuum chamber that encloses the entirety of DePoi's

loop. DePoi's loop is encompassed in vacuum box 26 as it is described that "[t]he loop can lengthen and shorten inside the vacuum box 26." *DePoi*, [0027].

88. A POSITA would understand that the components and operation of DePoi's pneumatic-based apparatus allow material to be fed through a double vacuum apparatus and account for the inertia load on the web that occurs to "rapid start/stop motion." *Id.* at [0002]. The web material is fed into the vacuum box 26 by first drive 24 which "moves with relatively constant velocity" during steady state operation. *Id.* at [0026]. The web moves into the vacuum box 26 as it passes over the entrance support surface or deck 38. *Id.* at [0027]. At the bottom of the vacuum box, "fans 36 create a low-pressure zone under the loop 32 which provides web tension of the web between the two drives 24, 30." *Id.* A POSITA would understand that this first vacuum system created by the fans at the bottom of the vacuum box affects the formation of the loop 32.

89. Drive 30 is downstream of the first drive 24 and "starts and stops every cycle, advancing that portion of the web 18 equal to the document/sheet length size to be cut." *Id.* at [0026]. However, drive 30 rapidly decelerates the transport speed of web 18. This rapid deceleration results in a high inertia load on the web that is "significantly larger than the tension force provided by a vacuum box 26." *Id.* at [0028]. To accommodate this high inertia load and difference in web transport speed, brake 28 "has been added to provide a fast-responding supplement to the vacuum

force 42 during rapid deceleration to maintain sufficient web tension on the web 18 between the brake 28 and the second drive 30.” *Id.* Brake 28 comprises a pneumatic manifold 44, a pneumatic valve 46, and a vacuum source 48. *Id.* at [0029]. There are also vacuum slots 50, forming a vacuum inlet, that are in the middle of the “downstream side of the frame 34 of the vacuum box 26 in close proximity to the curved deck section 40.” *Id.* As the web decelerates, the pneumatic valve 46 opens, and a vacuum airflow through the vacuum slots 50 is generated. *Id.* at [0030]. This airflow creates “a retarding friction force on the web.” *Id.* Thus, a POSITA would have understood that brake 28 accommodates for the difference of speeds in the machine by slowing the material down as it exits the vacuum box to a peak inertia load on the web.

90. Müller, on the other hand, achieves decoupling in an entirely different manner than DePoi’s double vacuum-based system. *See supra* at VI.A.2(a). Consequently, the result of combining the teachings of DePoi with Müller’s buffer 12 would be an added unnecessary and redundant step in Müller’s overall system with no advantages. The purported benefits Petitioner relies on for its motivation to combine are either already present in Müller alone or are merely solving the problems that exist solely because of the proposed combination with a vacuum chamber. A POSITA would therefore not have been motivated to incorporate the teachings of DePoi in Müller’s buffer 12.

a) Müller Alone Teaches Ensuring Appropriate Loop Length and No Motivation Exists to Modify it with DePoi

91. Petitioner argues through its expert that a POSITA would be motivated to combine DePoi techniques with Müller “to ensure that an appropriate length of loop is stored in Müller’s buffer.” ’823 *Jobin Decl.* at ¶331. However, as discussed above Müller alone teaches ensuring an appropriate length of the loop in buffer 12. *Supra* at VI.A.3(a). Thus, it is unclear why a POSITA would have been motivated to incorporate DePoi’s teachings for the benefit of a functionality—ensuring appropriate loop length—that was already present in Müller. It’s a straightforward design/engineering proposition that systems aren’t changed when such changes have no functional or hardware benefits. Accordingly, absent any explanation or identification of benefits that compel modification, a POSITA would not be motivated to modify Müller with DePoi’s teachings. To the extent Petitioner argues that DePoi’s method prevents against more damage to the web than Müller’s method, it has provided zero support for such assertion.

b) Müller Would Not Benefit From “Additional Advantages of a Vacuum Brake”

92. The remainder of Petitioner’s motivation to combine relies on a POSITA’s general awareness “of advantages to adding a vacuum brake to Müller.” Petition at p. 55. Mr. Jobin’s declaration sets forth a nearly identical motivation to combine to the ’013 Ground 1 discussed above, highlighting (1) improved threading;

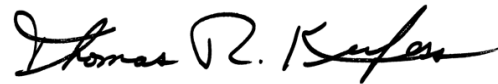
(2) tension control; and (3) loop stabilization. '823 *Jobin Decl.*, ¶¶215-228. Because these arguments are substantively identical to those addressed above in Sections VI.A.3(b)(1)-(3), my opinions apply equally to the combination of Müller with DePoi. Looking at Müller as a whole, the touted benefits of a vacuum brake do not support a motivation to combine because such benefits are either already realized by Müller (and would not be further improved by DePoi's teachings), or are wholly inapplicable to Müller altogether. *See supra* ¶¶53-59.

VIII. CONCLUSION

93. I hereby declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct, and that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I understand that willful false statements are punishable by fine or imprisonment or both. *See* 18 U.S.C. § 1001. If called to testify as to the truth of the matters stated herein, I could and would testify competently.

Date: 12 September 2024

Respectfully submitted:



Dr. Thomas Kurfess