

Inter Partes Review U.S. Patent No. 8,529,321

Oral Argument, March 5, 2025

Provisur Technologies, Inc. v. Weber Food Technology GmbH
Case No. IPR2024-00235

Patent Owner's Demonstrative Exhibits – Not Evidence

Patent Owner's PX-I
IPR2024-00235
Weber EX2012

U.S. Patent No. 8,529,321:

- ▶ **Disputed Limitations—(1) measuring fat cover thickness and (2) cutting in dependence on fat cover thickness measurement**
- ▶ Claim 1. An apparatus for separation of a fat cover of a meat product from a flesh component of the meat product, comprising:
 - ▶ a measurement device for automatic determination of the thickness of the fat cover, wherein the determination of the thickness of the fat cover takes place in a contactless manner; and
 - ▶ cutting device coupled to the measurement device for automatic separation of the fat cover from the flesh component in dependence on the thickness determined by the measurement device, wherein the cutting device comprises:
 - ▶ a cutting blade whose position is variable relative to a product support; and
 - ▶ a control unit for control of the position of the cutting blade in dependence on the thickness determined by the measurement device, wherein at least one travel profile is stored in the control unit in accordance with which the position of the cutting blade relative to the product support is to be set in dependence on a product feed.

Reality of Petitioner's Invalidity Theories

- ▶ (1) *Young* does not anticipate—its process is fat cover thickness agnostic
 - ▶ *Young* does not measure fat cover thickness
 - ▶ Legal flaw: Whether *Young* **could be** modified to measure thickness **irrelevant** to anticipation
 - ▶ Factual Flaw: *Young*'s top view cannot determine fat cover thickness
 - ▶ *Young* cuts along internal line independent of fat cover thickness

- ▶ (2) *Young/Norrie* combination lacks motivation
 - ▶ Petitioner's expert admitted:
 - ▶ There is no reason to use *Norrie*'s camera in *Young*'s system
 - ▶ He had not considered how *Young*'s process might change if modified pursuant to *Norrie*
 - ▶ *Young* teaches away from *Norrie*

- ▶ (3) *Johnson/Belk* combination:
 - ▶ Is the result of improper hindsight bias
 - ▶ Renders *Johnson* inoperable for its intended purpose
 - ▶ Incorrectly presumes *Belk* determines fat cover thickness

(I) *Young* Does Not Measure Fat Cover Thickness

Petitioner's theory based on fat/lean separation and edge lines

After the data is collected, controller 172 performs a full image analysis, including generation of a fat/lean separation line which “will be distinguished by the interface between the loin meat and the *fat covering*[.]” (EX1004, 23:11-24)(emphasis added.) Controller 172 then performs an additional step where height, width and, length of the meat product is calculated, using the “known values calculated in the aforementioned image processing steps[.]” (EX1004, 24:10-15.) Controller 172, via routine 240, also calculates the height, width, and length of other portions of the meat product such as the distance between the fat/lean separation line, and the edge of the meat product related to the thickness of the fat cover. (EX1004, 22:53-65, 22:10-22, 24:34-39, Fig. 13.)

Petition, 32.

The distance between the edge line and the fat/lean separation line corresponds to the thickness of the fat cover. EX1004, 23:20-27, 24:34-39.

Pet. Reply, 6.

(I) Young Does Not Measure Fat Cover Thickness

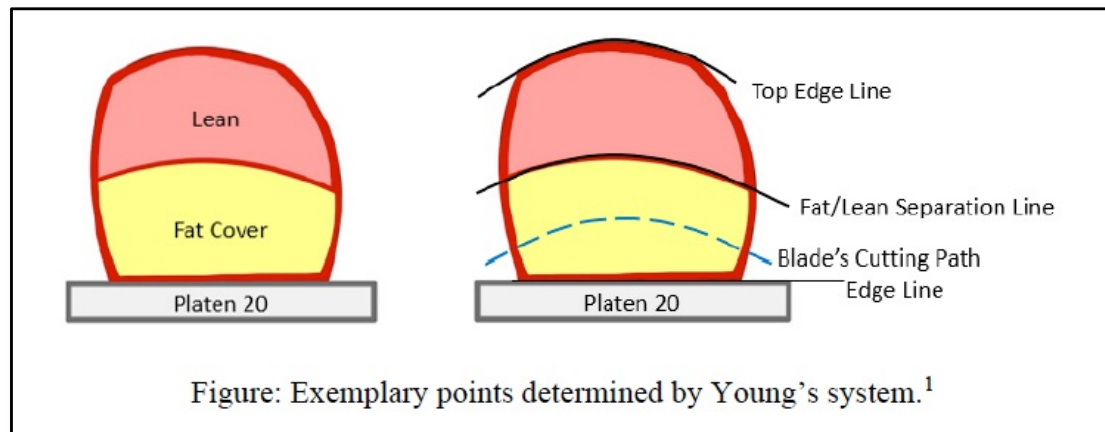
Petitioner Misunderstands Young's Teachings

► Young:

Next, in block 246, routine 240 generates a fat/lean separation line and an edge line from the non-shadowed top view image. Similar to block 242, noise reduction, thresholding and convolution are performed on the non-shadowed image to generate both lines. However, it will be appreciated that due to the different lighting, different control variables, e.g., the threshold variable, from the variables used on the shadowed image will be required to generate the fat/lean separation and edge lines from the non-shadowed image. In general, the fat/lean separation line will be distinguished by the interface between the loin meat and the fat covering, which is typically much lighter than meat. Similarly, the edge line (representing the outer surface of the pork side proximate the fat/lean line) will be distinguished by the interface between the fat covering and the platen or other supporting structure proximate the edge of the pork side.

Young, 23:12-27.

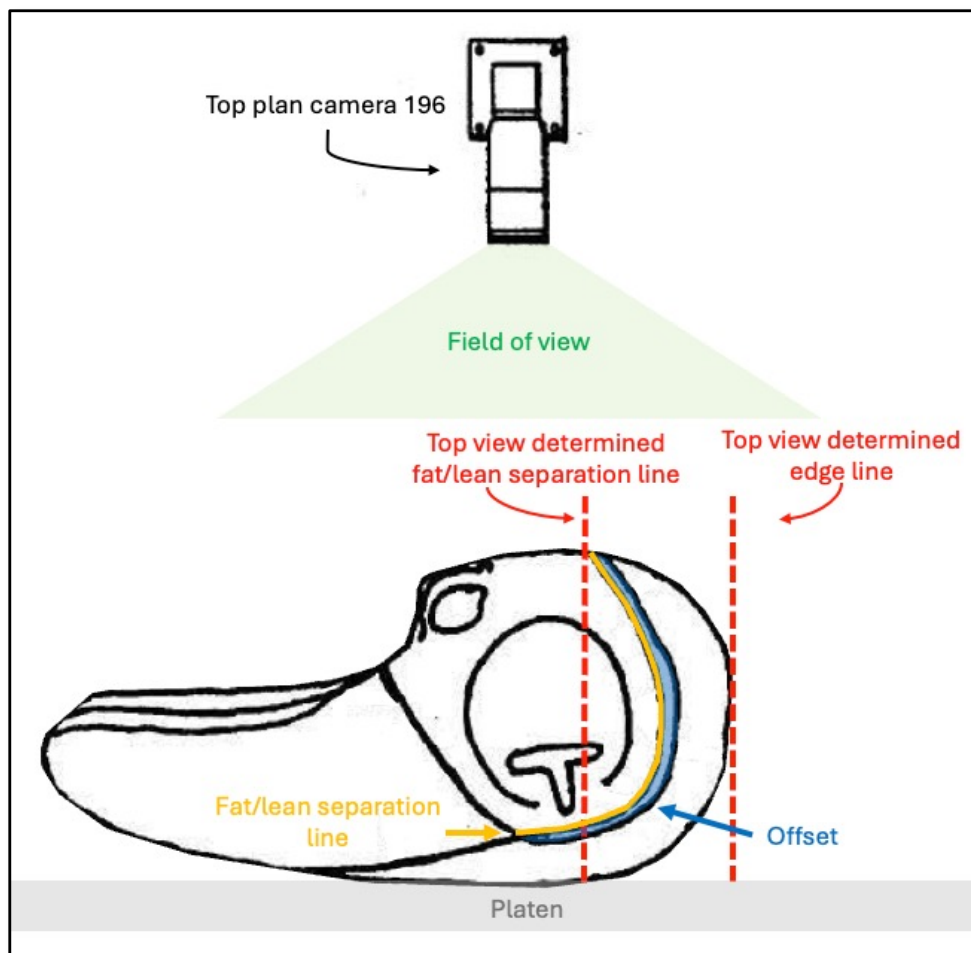
► Petitioner's interpretation:



Pet. Reply, 5.

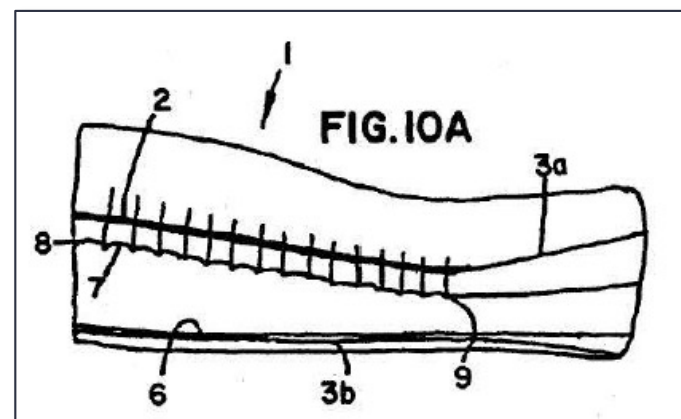
(I) Young Does Not Measure Fat Cover Thickness

Petitioner Misunderstands Young's Teachings

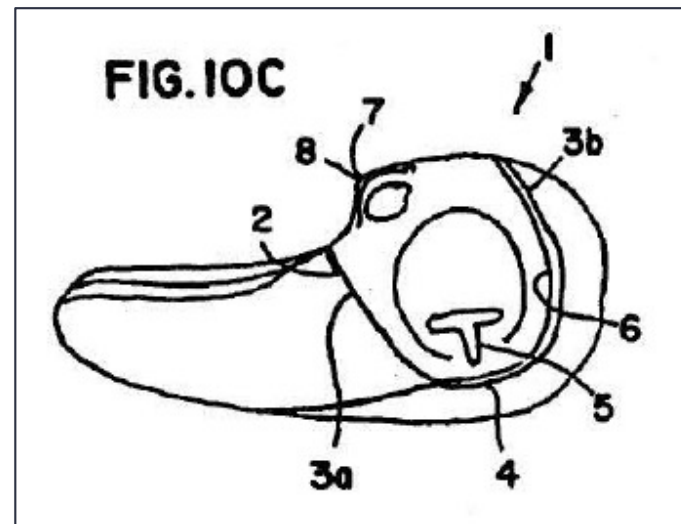


Young, Fig. 10(c)(annotated); Sur-Reply, 6.

Top view:

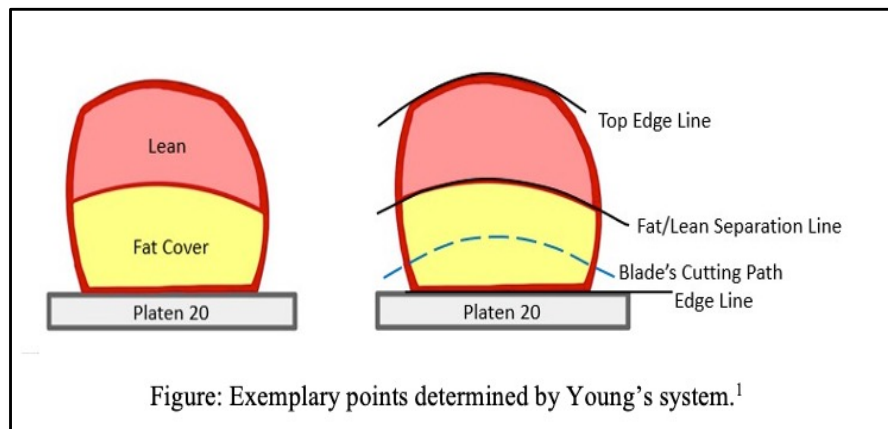


End view:

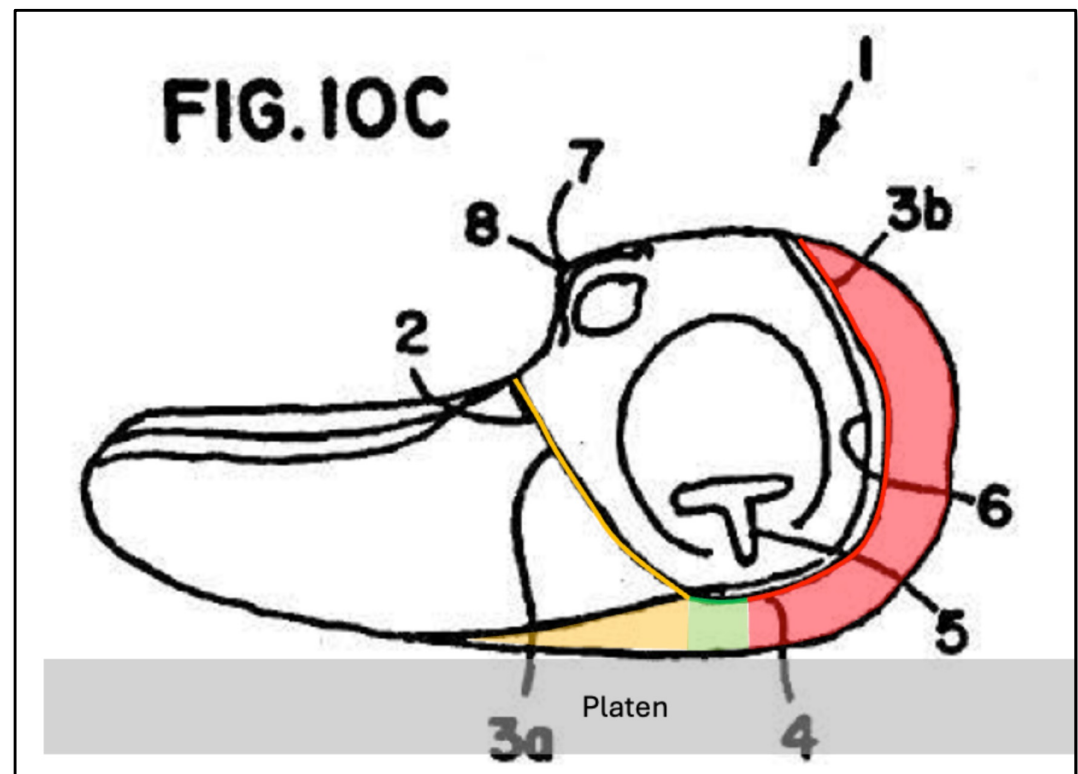


(I) Young Does Not Cut In Dependence on Fat Cover Thickness

- ▶ At best, Petitioner's theory shows a small sliver of fat cover thickness could theoretically be used to define the cut line



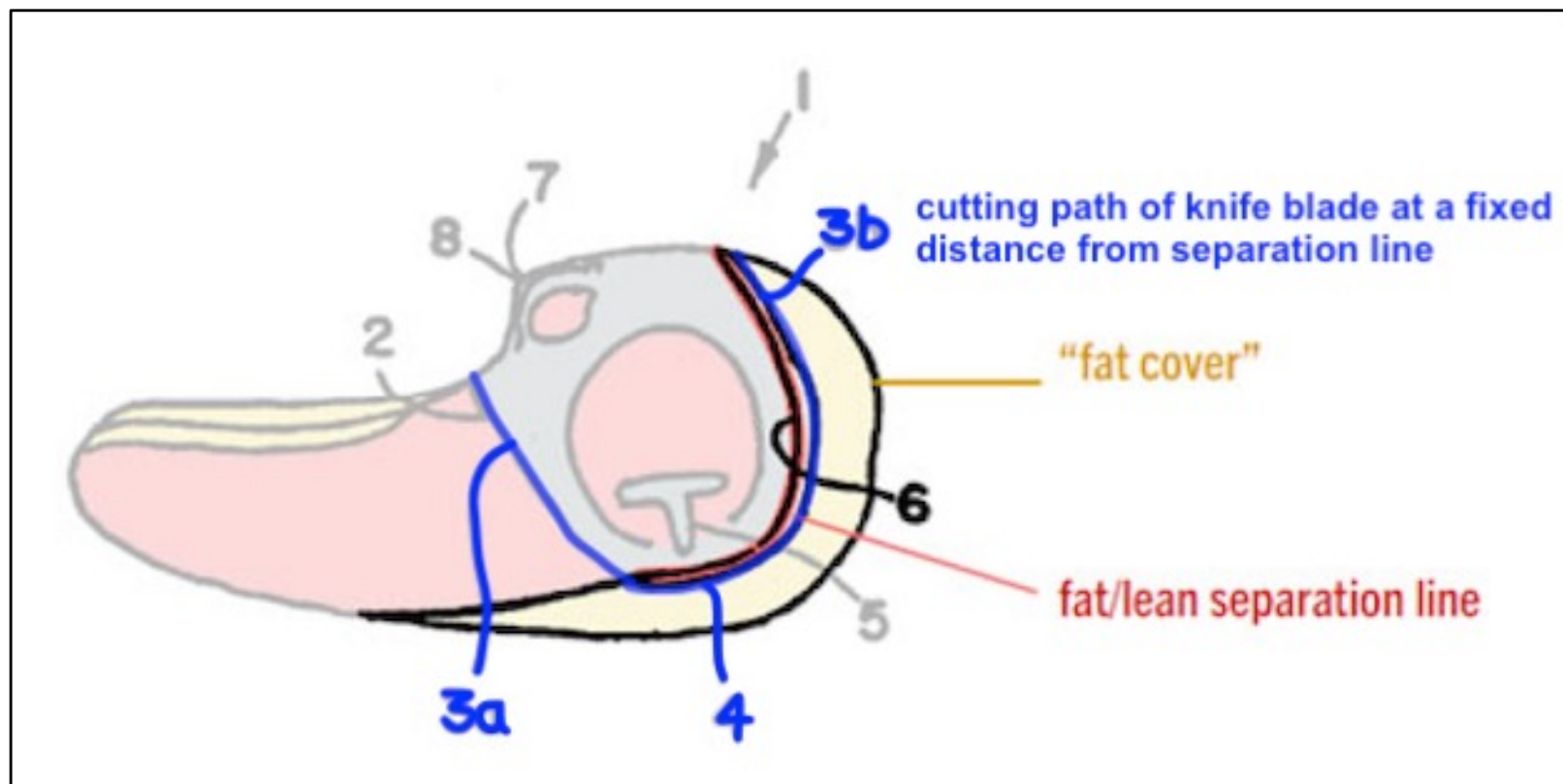
Sur-Reply, 11.



Sur-Reply, 12.

(I) *Young* Does Not Cut In Dependence on Fat Cover Thickness

- ▶ *Young*'s cutting blade "cuts a fixed distance from fat/lean separation line 6 to separate the belly, which is a fat cover in this example." Petition, 17.



Young, Fig. 10c (annotated); POR, 8.

(2) Young/Norrie Lacks Motivation to Combine

- ▶ Spanning fewer than 3 pages, Ground 2 proposed two motivations to combine *Young* and *Norrie*:
 - ▶ (1) Support more sophisticated profiles
 - ▶ (2) provide system/process improvements re control, customization, consistency, yield, etc.

Second, a POSA would have been strongly motivated to combine Young and Norrie. (See, e.g., EX1003, ¶¶175-177.) Young explicitly points to “U.S. Patent No. 4,979,269 to Norrie” as “an automated loin separation system” that addresses “the problems associated with manual loin separation processes.” (EX1004, 2:25.) Moreover, Young explicitly states “additional imaging and motion functionality may be included to provide more sophisticated profiles using the preferred scribe saw and knife assemblies. Also, the design or control system 170 can be modified to incorporate different accessory components.” (EX1004, 20:17-24.) Young gives Norrie as an example “resulting in more efficiency and more repeatable results.” (EX1004, 2:27-29.) Young also emphasizes the general needs in the art to achieve greater control, customization, and consistency, as well as to optimize yield and reduce waste. (EX1004, 2:43-51.)

A POSA looking at Young would have been directly led to Norrie to achieve additional imaging functionality, such as Norrie’s thickness sensing, in view of these well-established and explicit stated needs in the art. (EX1003, ¶¶175-176; EX1004, 2:27-29.)

Petition, 52-53.

(2) *Young/Norrie* Lacks Motivation to Combine

Norrie cannot support more sophisticated profiles

- ▶ *Young* “explicitly points to” *Norrie* in disparagement, rather than encouragement
- ▶ Petitioner does not dispute that *Norrie* allows for adjustment in only one axis of motion

To address the problems associated with manual loin separation processes, various automated loin separation systems have been proposed. Examples include U.S. Pat. No. RE 28,508 to Neebel et al., U.S. Pat. No. 3,234,591 to Vogt et al., U.S. Pat. No. 3,685,095 to Metro, U.S. Pat. No. 3,771,196 to Doerfer et al., U.S. Pat. No. 4,189,806 to Van Heyningen, U.S. Pat. Nos. 4,970,755 and 5,090,939 to Leblanc, U.S. Pat. No. 4,979,269 to *Norrie*, and U.S. Pat. Nos. 5,234,371 and 5,295,898 to Andre et al., among others.

Many of these systems attempt to replace human operators with automated loin knives and scribe saws, often resulting in more efficiency and more repeatable results. However, many prior automated systems are limited in the degree of control they provide over the loin knife and scribe saw. In particular, many systems only allow adjustment of a loin knife and/or a scribe saw in at most one or two axes of motion. It will be appreciated that every pork side is somewhat different in contour, size, weight, etc. Furthermore, it is difficult to reproduce the different subtle motions experienced human operators use to optimize end products with limited control over the loin knife and scribe saw. Thus, conventional automated systems often are not capable of separating loins from bellies at the optimum points of separation, often resulting in unacceptable waste product and lower yields.

Young, 2:18-42.

(2) Young/Norrie Lacks Motivation to Combine

Norrie does not improve Young's system

- ▶ Dr. Collins admitted *Norrie* does not practically impact *Young's system*

13 Q What role does Norrie serve in the proposed
14 combination set forth in Ground 2?
15 A Well, I think Norrie, frankly, is redundant
16 of what's already disclosed in Young, that everything
17 is disclosed in Young.

Ex. 2006, 41:13-17.

8 Is there any technical reason to add
9 Norrie's camera 54 to Young's system?
10 A I don't see why. I think they could use the
11 existing cameras of Young.
12 Q And that -- specifically, that would be
13 Young's fat line camera 198 that would be used to
14 serve the same purpose as Norrie's camera?
15 A Yeah, I'd have to go back and check. I
16 think -- I have to go back and check to see if Norrie
17 uses the overall height of the -- of the product in
18 the analysis. I'd have to go back and check.
19 Q Okay. Can you check that? I want to just
20 make sure I understand what you're -- what you're
21 theory is here.
22 A Yeah, my review of Norrie, I don't believe
1 there needs to be a different camera than the -- than
2 the Young fat line camera.

Ex. 2006, 43:8-44:2.

(2) Young/Norrie Lacks Motivation to Combine

Norrie does not improve Young's process

- ▶ Dr. Collins admitted *Norrie* does not practically impact Young's process

Q. ... I'd like to explore what changes in Young's system are made pursuant to this proposed modification of incorporating Norrie's software or algorithm. And I'd like to ask you a hypothetical. So let's assume Pork Side A is processed in an unmodified Young system and Pork Side B is processed by Young's system implementing Norrie's software as you've suggested

...

Q. Assuming the user is not intending to retain more fat than there is fat to retain, can you think of any other scenarios in which the cuts differ between Pork Side A and Pork Side B?

A. I really haven't given it much thought; so I'd -- I'd have to think about it.

Q. How about the process of determining the cutlines? How would the process of determining the cutlines differ between Pork Side A and Pork Side B?

A. I don't believe there's a -- there's a fundamental difference. So, again, the -- the

Ex. 2011, 31:19-34:6.

(3) *Johnson/Belk* Relies on Improper Hindsight Roadmapping

- ▶ Challenged Patent proposes non-contact fat cover thickness measurements to avoid the downsides of probe-based systems

To be able to separate the rind and the fat, i.e. the fat cover, from the flesh component of a meat product in an automated process, it is necessary to know the thickness of the fat cover, in other words its size or height. Known measurement devices provide a sensor for the determination of the thickness of a fat cover of a meat product which is inserted into the product and detects the environmental brightness during the insertion. A conclusion can be drawn on the consistency of the material pierced by the sensor or at least a change in the consistency can be detected by an evaluation of the different brightness values occurring during the insertion and detected by the sensor, from which ultimately the thickness of a fat cover can be determined.

It is disadvantageous in this connection that the meat product is damaged by the insertion of the sensor, in particular since the sensor has to be inserted at multiple sites of the product for a reliable determination of the thickness of the fat cover or a plurality of sensors arranged in a distributed manner have to be inserted into the product simultaneously.

It is the underlying object of the invention to provide a measurement device which allows a determination of the thickness of a fat cover of a meat product without damaging the meat product in so doing.

Ex. 1001, 1:18-40.

(3) *Johnson/Belk* Relies on Improper Hindsight Roadmapping

- ▶ Ground 3 combines:
 - ▶ *Johnson*—a probe-based system of the type disparaged by Challenged Patent
 - ▶ *Belk*—an imaging system for grading meat that does not measure fat cover thickness
- ▶ Petitioner and its expert repeatedly point to the Challenged Patent’s disparagement of probe-based systems as motivation for combination

47. Johnson’s probe assembly sensor system reduces quality because it punctures the meat, reducing its value. *See* EX1001, 1:31-36. Therefore, as explained with hygiene, a POSA would consider it advantageous to replace Johnson’s probe assembly sensor system with a contactless sensor system, such as disclosed in *Belk*, to eliminate these punctures and increase the value of the end product. Accordingly, a POSA would be motivated for that reason to arrive at the proposed combination.

Ex. 1035, ¶47.

(3) *Johnson/Belk* Destroys *Johnson's* Primary Purpose

- ▶ *Johnson* accommodates unpredictable fat covers by creating 3D map

2. Background Art

The contour of the fat/lean on a beef strip as well as on other meat cuts is erratic and testing has shown no correlation. Therefore humans need to physically remove the thick

...

The greatest disadvantage of using other machines is the variable profile of the fat/lean interface for a meat cut particularly that of the beef strip meat cut. Further, human cutting cannot determine the fat/lean interface until after the lean has been cut which may down grade the product.

SUMMARY OF INVENTION

The present invention is a meat cut classification and fat trimming method and apparatus for sensing or classifying the thickness of a layer of fat of a cut of meat and the various contours thereof as it travels along a conveyance path and providing the fat thickness or classification information to a downstream system for performing a fat trimming operation.

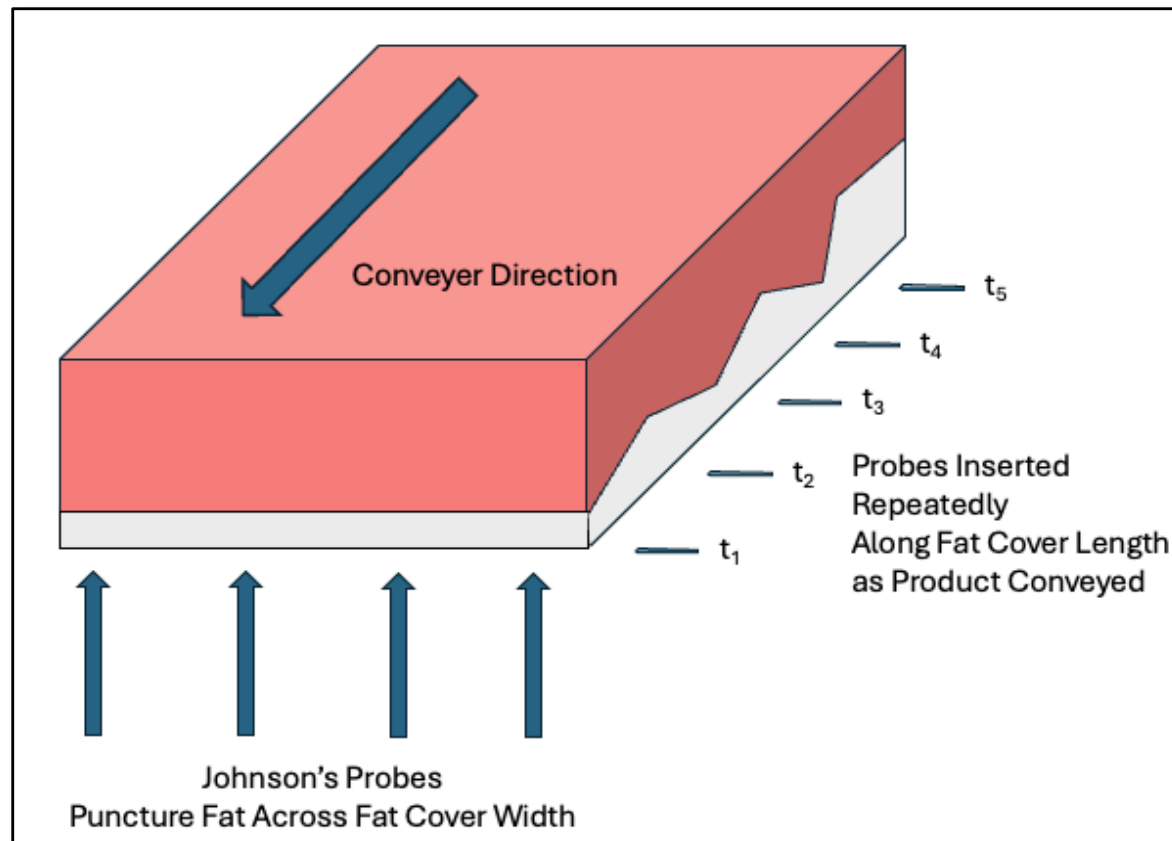
Johnson, 1:17-55.

There are several advantages to the present invention. One advantage is that the beef strip meat cuts are fed into the machine continuously and the probing devices are multiple in effect. Multiple probes ensure a better “mapping” of the profile since there is little consistency or correlation for the fat/lean contour from one beef strip to another beef strip. Another advantage is that the meat cut is mechanically secured and fed through the machine with a conveyor on the bottom side and an overhead hold-down conveyor on top. This method of movement provides constant movement of the product in a secured manner. A third advantage is controlled blades that are capable of following a three-dimensional fat/lean interface map. The present method and apparatus can be utilized for meat cuts other than the beef strip to determine the contour of a fat/lean interface.

Johnson, 2:37-51.

(3) *Johnson/Belk Destroys Johnson's Primary Purpose*

- ▶ *Johnson's* 3D mapping is created using multiple probes across the width of the product, repeatedly inserted as product conveyed



POR, 33; Ex. 2007, ¶57.

(3) *Belk* Renders *Johnson* Inoperable for its Intended Purpose

- ▶ Ground 3 is limited to *Belk*'s camera-based embodiments
 - ▶ No other imaging systems are discussed in Ground 3 challenge
 - ▶ Certain challenged dependent claims require limiting Ground 3 to cameras
- ▶ *Belk*'s camera-based embodiments cannot support *Johnson*'s 3D mapping functionality—they obtain surface information only
- ▶ Petitioner does not dispute that *Belk*'s camera-based embodiment is incapable of generating *Johnson*'s 3D map

Additionally, even if *Belk* were limited to a conventional camera unable to measure interior fat, Patent Owner ignores the clear and significant benefits of the proposed combination provides, which would motivate a POSA to arrive at the combination regardless.

Pet. Reply, 22.

(3) *Belk's* Imaging System Grades Meat

It does not measure fat cover thickness

- ▶ *Belk* determines palatability of meat (e.g., marbling) by visually analyzing “areas of interest,” which can be a muscle of interest
- ▶ *Belk* expressly recommends **ignoring** areas outside muscle of interest:

Within the portion of the image taken from the muscle of interest, the lean tissue and fat tissue of the muscle can be distinguished and raw L*, a*, and b* scores, and variation in L*, a* and b* scores across the area of interest, for the lean tissues of the muscle can be determined. These scores can then be sent to the output device 24 to be displayed in numerical format and/or retained to calculate quality- and yield-determining characteristics as described below. It is known that, among other characteristics, higher values of b* for lean tissues of muscle correlate with greater tenderness (Wulf et. al., 1996). In addition, the fat color and color variability of intermuscular fat can also be determined.

Also within the portion of the image taken from the muscle of interest, determinations can be made of the quantity, distribution, dispersion, texture, and firmness of marbling (intramuscular fat deposited within the muscle). The quantity of marbling can be determined by calculating the percentage of muscle surface area with L*, a*, and b* scores compatible with fat tissue.

Belk, 9:7-25.

scores for verification and rejection of surrounding tissues invading the outline of the muscle of interest. Further examination need not be performed on areas with L*, a*, and b* scores suggestive of bone, connective tissue, and fat.

Belk, 9:1-4.