United States District Court,
D. New Jersey.

METROLOGIC INSTRUMENTS, INC,
Plaintiff.
v.
PSC INC,
Defendant.

No. Civ. 99-4876(JBS)

Aug. 26, 2003.

Edwin Chociey, Riker, Danzig, Scherer, Hyland & Perretti, LLP, Morristown, New Jersey, and Dennis J. Mondolino, Douglas R. Weider, Peter Schuyler, Morgan, Lewis & Bockius, LLP, New York, New York, for Plaintiff Metrologic Instruments, Inc.

Joel Schneider, Archer & Greiner, P.C., Haddonfield, New Jersey, and James H. Shalek, Robert S. Mayer, Baldassare Vinti, Proskauer Rose LLP, New York, New York, for Defendant PSC Inc.

OPINION

SIMANDLE**, J.**

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Plaintiff Metrologic Instruments, Inc. ("Metrologic") filed this complaint against defendant PSC Inc. ("PSC") on October 12, 1999, alleging that defendant's products infringed Metrologic's United States Patent Nos. 5,637,852 (the '852 patent), 5,627,359 (the '359 patent), 5,789,731 (the '731 patent), 5,260,553 (the '553 patent), 5,343,027 (the '027 patent), 5,686,717 (the '717 patent), 5,828,049 (the '049 patent), and 5,081,342 (the '342 patent). PSC filed a counterclaim, seeking a declaratory judgment of non-infringement and alleging unfair competition under s. 43 of the Lanham Act.

The issue currently before the Court is the claim construction of certain claim limitations of patents '359, '731, '852, '027, and '342. This Court held a *Markman* hearing on August 6 and 7, 2002. After defendant filed bankruptcy in December 2002, the case was administratively terminated on December 17, 2002. The case was reopened on July 18, 2003, after defendant emerged from bankruptcy. This Opinion sets forth the Court's construction of the disputed claim limitations in Metrologic's '359, '731, '852, '027, and '342 patents.

I. *BACKGROUND*

A. *The '359 and* '731 Patents

The Court draws the following facts from the evidence presented at the claim construction hearing on August 6 and 7, 2002, and the exhibits attached to the parties' claim construction submissions. The application that led to the '359 and '731 patents, FN1 relates to bar code scanners used in supermarkets and addresses problems concerning the ability of customers to view the interior of scanners, and the previous prohibitiveness of cost in designing an effective optical filtering technique. As noted in the Background section of the '359 patent, the electro-optical components, including swirling laser beams and scanning windows, of previous scanners were revealed to customers, detracting from the appearance of store displays and check-out counter environments. In addition, different optical filtering techniques had been developed in prior art scanners for combating the adverse effects of ambient lighting levels on scanning performance and to improve the signal-to-noise ratio (SNR) of laser scan data signals, without much success. *See* '359 Patent, col. 1, l. 20-col. 2, l. 34, Pl.'s '359 & '731 Markman Br.App. Ex. 2. Furthermore, prior art band-pass filters are "very expensive and difficult to manufacture," in view of the necessity of using special optical cements and bonding techniques to form an integral filter structure. '359 Patent, col. 9, ll. 42, 54-58.

FN1. Metrologic's '359 patent was filed on May 11, 1995 and issued on May 6, 1997, and the '731 patent was filed on April 24, 1997, and issued on August 4, 1998. Both patents claim priority as a continuation in part from U.S. Patent No. 5,340,971, filed on September 17, 1991. Both the '359 and '731 patents share the same specification.

The '359 and '731 patents are directed to a laser bar code symbol scanner with a narrow band-pass optical filtering system. Specifically, the patents include a filtering system composed of two optical filter elements, the first element having wavelength selective filtering characteristics installed at the front scanning window of the scanner housing, and the other located at the photodetector that cooperates with the first filter to form a narrow bandpass optical filtering system. The bandpass absorbs light above a certain wavelength and below a certain wavelength so as to pass only laser light and filter out ambient light outside the wavelengths of the bandpass. The first optical element has selective optical filtering characteristics in the band that make the filter appear red. The invention attempts to solve previously identified problems with prior art scanners, which used a band-pass filter placed before the photodetector having clear windows covering the aperture opening. This invention masks the unsightly electrical optical components mounted within the scanner using the red filter that results, and by combining two inexpensively manufactured half-filter components to create a functional, narrow band-pass filtering component. FN2

FN2. The objects of the invention are as follows: (1) to provide a laser bar code symbol scanning system that is capable of reading bar codes without the shortcomings and drawbacks of prior art devices; (2) to provide a scanner with a novel optical filtering system providing scanner performance, appearance, and manufacturability; (3) to provide a scanner with strategically installed and spatially-separated wavelength-selective components of the optical filter systems; (4) to provide a scanner wherein the optical filtering system is hidden from view; and (5) to provide a scanner that satisfies the concerns of store owners troubled by the scanner's transparency, and to overcome the problems caused by high intensity ambient lighting. *See* '359 Patent, col. 2, 11. 36-61, Pl.'s '359 & '731 Markman Br.App. Ex. 2.

1. *Basic Mechanics of Bar Code Scanners*

Exhibit 1 from plaintiff's *Markman* presentation provides an important illustration of the basic mechanics of

bar code scanners. *See* Pl.'s Markman Hrg. Ex. 1 (attached hereto as Appendix E). The purpose of the bar code scanner is to scan bar codes using a laser light, which scans the bar code and reflects light, picking up information corresponding to the spaces between the black lines of the bar code symbol, back into the scanner, to be processed to convey pricing information back to the cashier. The scanner does this by projecting a laser light beam onto a scanning polygon which directs the laser light upon the surface of the bar code being scanned, creating the effect of a line. Because laser light is usually measured in the range of 640-670 nanometers, which is the approximate wavelength of the color red, this line of laser beam light will often be seen as red.

The laser light is reflected back into the scanner through the collection optics system, which is much like a concave mirror, and into the photodetector, an electrical device which produces electricity when hit by light. A current is produced from the photodetector and runs through the amplifier, creating an amplified analog waveform. This analog waveform goes through the digitizer, which changes it to a digitized waveform that has square waveform characteristics. After the square waveform is created, it enters the decoding phase, in which the decoded waveform is used to acquire pricing information to be relayed to the cashier display.

2. ***Band-Pass Technology***

An important component of the '359 and '731 patents is the band-pass filter. The main purpose of the filtering system is to optimally take in only laser light, which is detected by internal components and from which pricing information about the store product is conveyed from the internal computer to the cashier display. Laser light is usually of the length of or around 670 nanometers, and blocks out ambient light, *i.e.,* all other light with wavelengths above or below that measurement. The laser wavelength of Metrologic's invention lies at 670 nanometers, in the visible region of the electromagnetic spectrum, at or near the color red.

Prior art devices had used one internal band-pass filter, which combined the blocking out of light of both high and low wavelengths. The manufacturability of this design proved expensive. Metrologic's patents specifically improve upon this by combining two filters which filter out ambient light of short wavelengths, including ultraviolet and x-ray light, and long wavelengths, such as infrared and microwave light. The low band-pass, which filters out ambient light of less than 640 nanometers, is also called the blue pass filter. The high band-pass filter, which blocks ambient light with wavelengths above 640 nanometers, is also called the red pass filter. Figure 3 of the patent shows the area of wavelengths that is transmitted, subsequent to filtering of ambient light both above and below the effective wavelength. *See* '731 Patent Fig. 3, reproduced at Pl.'s Markman Hrg. Ex. 9 (attached hereto as Appendix F).

B. '852 Patent

Plaintiff Metrologic's '852 patent was filed on June 7, 1995, and issued on June 10, 1997. The patent claims priority as a continuation of U.S. Patent No. 5,216,232, which was filed on September 10, 1990. The '852 Patent is directed to a bar code scanner that sits above a counter and projects a narrow, dense pattern of light, the cross-section of which is patterned. The scanner is designed to read the bar code of objects placed within this dense pattern, regardless of its orientation. This is achieved by projecting many lines of laser light at different angles in front of the scanner. The ability to scan bar codes no matter what angle they face the scanner is beneficial because it allows a clerk at a high-volume check-out counter to scan items quickly, irrespective of their orientation. In addition, counter space, particularly at smaller and lower-volume retail establishments, is preserved by the scanner's placement above the counter. Although placement above the counter had previously caused scanners to inadvertently read bar codes of items located nearby, an

additional benefit with this device is that items placed nearby are not scanned, due to the narrowness of the laser light. Thus, Metrologic's '852 patent discloses and claims an optical design capable of generating a scan pattern which is rich in scan lines and which has a scan pattern of narrow volume. Figure 1 of the patent provides a useful schematic in visualizing the scan pattern and the efficient use of counter space it presents. *See* '852 Patent Fig. 1, reproduced at Def.'s '852 Markman Presentation, Slide 11 (attached hereto as Appendix G).

C. '342 Patent ***and*** '027 Patent

The '342 Patent and '027 Patent FN3 are directed to a device that receives and decodes electrical input signals from multiple scanners operating at different speeds wherein the electrical input signals are the digital representations of bar codes. These patents purportedly cover a decoding device that can connect with both a high speed scanner and a slower speed scanner including slot or hand held scanners and light pens and wands. According to plaintiff, this occurs due to the device's ability to generate a large number of frequencies and to automatically set the frequency. Such compatibility provides for flexibility in scanning oversized, bulky items that are difficult to maneuver and place on the counter. The advantage of these "Multi-Port Patents" or "Dual Port Patents" over the prior art, as plaintiff alleges, is that the previous devices could not be operated with all types of scanning devices and had no ability to select the frequency appropriate for each scanner type. In addition, the scanners attached to the '342 and '027 patents purportedly do not require their own decoding device, thereby achieving significant cost savings.

FN3. Metrologic filed its first U.S. Patent application related to multi-port processing on June 6, 1989. The initial U.S. application led to a U.S. Patent No. 5,081,342 ('342 patent) which issued on January 14, 1992. Metrologic filed several continuations of the initial application, which issued into the following additional three patents: U.S. Patent No. 5,343,027 ('027 patent), issued on August 30, 1994; U.S. Patent No. 5,828,049 ('049 patent), issued on October 27, 1998. Since all four patents are continuations of the first application, they all share the same patent specification and priority date.

II. ***DISCUSSION***

A. ***Legal Principles of Claim Construction***

" 'Claim construction' is the judicial statement of what is and is not covered by the technical terms and other words of the claim." Network, LLC v. Central Corp., 242 F.3d 1347, 1352 (Fed.Cir.2001). The Court may construe only those terms that are in controversy, not every term of a claim, and only to the extent necessary to resolve that controversy. *See* United States Surgical Corp. v. Ethicon, Inc., 103 F.3d 1554, 1568 (Fed.Cir.), *cert. denied,* 522 U.S. 950 (1997).

In determining the proper meaning of claims, courts must consider the "intrinsic evidence," *i.e.,* the claim language itself, the specification, and the prosecution history. *See* Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed.Cir.1995) (*en banc*), *aff'd,* 517 U.S. 370 (1996); Victronics Corp. v. Conceptronics Inc., 90 F.3d 1576, 1582, 1584 (Fed.Cir.1996). The Federal Circuit has explained these principles governing claim construction:

Courts have the "power and obligation to construe as a matter of law the meaning of language used in patent claims." To determine the proper meaning of claims we first consider the so-called intrinsic evidence, *i.e.,* the claims, the written description, and, if in evidence, the prosecution history. Even within the intrinsic

evidence, however, there is a hierarchy of analytical tools. The actual words of the claim are the controlling focus. The written description is considered, in particular to determine if the patentee acted as his own lexicographer, as our law permits, and ascribed a certain meaning to those claim terms. If not, the ordinary meaning, to one skilled in the art, of the claim language controls. The prosecution history is relevant because it may contain contemporaneous exchanges between the patent applicant and the PTO about what the claims mean. If upon examination of this intrinsic evidence the meaning of the claim language is sufficiently clear, resort to "extrinsic" evidence, such as treatises and technical references, as well as expert testimony when appropriate, should not be necessary.

Digital Biometrics, Inc. v. Identix, Inc., 149 F.3d 1335, 1343-44 (Fed.Cir.1998) (citations omitted). A patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning "as long as the special definition of the term is clearly stated in the patent specification or file history." Victronics, 90 F.3d at 1582 (citing Hoechst Celanese Corp. v. BP Chems. Ltd., 78 F.3d 1575, 1578 (Fed.Cir.), *cert. denied,* 519 U.S. 911 (1996)).

"[T]he written description [in the specification] can provide guidance as to the meaning of the claims, thereby dictating the manner in which the claims are construed, even if guidance is not provided in explicit definitional format." SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1344 (Fed.Cir.2001). "The general rule ... is that the claims of a patent are not limited to the preferred embodiment" described in the specification. Karlin Tech. Inc. v. Surgical Dynamics, Inc., 177 F.3d 968, 973 (Fed.Cir.1999), *appeal after remand dismissed,* 217 F.3d 859 (Fed.Cir.1999). "Where the specification makes clear that the invention does not include a particular feature, that feature is deemed to be outside the reach of the claims of the patent, even though the language of the claims, read without reference to the specification, might be considered broad enough to encompass the feature in question." SciMed Life Sys., 242 F.3d at 1341.

The prosecution history contains the complete record of all proceedings before the Patent and Trademark Office, including express representations made by the applicant regarding the scope of the claims, and any amendments and statements made by the applicant during prosecution often are of "critical significance" to the interpretation of a claim. *See* Vitronics, 90 F.3d at 1582-83. Thus, "the prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution." Rheox, Inc. v. Entact, Inc., 276 F.3d 1319, 1325 (Fed.Cir.2002) (citation omitted).

If the terms of the claim remain ambiguous, courts may look to "extrinsic evidence," which includes expert testimony, inventor testimony, dictionaries, and treatises and articles. Vitronics, 90 F.3d at 1583. However, extrinsic evidence can never be used to contradict the meaning of claims discernable from examination of the intrinsic evidence. *See* id. at 1583-84 ("[I]t is improper to rely on extrinsic evidence" where the intrinsic evidence alone resolves ambiguity of disputed term.).

One issue raised by the parties is estoppel based on prosecution history. Prosecution history estoppel is a "rule of patent construction" that requires that the claims of a patent be interpreted in reference to claims cancelled or rejected in proceedings held in the Patent and Trademark Office (PTO) during the application process. *See* Festo v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 122 S.Ct. 1831, 1838 (2002) (quoting Schriber-Schroth Co. v. Cleveland Trust Co., 311 U.S. 211, 220-21 (1940)). "When ... the patentee originally claimed the subject matter alleged to infringe but then narrowed the claim in response to a rejection, he may not argue that the surrendered territory comprised unforeseen subject matter that should be deemed equivalent to the literal claims of the issued patent." Festo, 122 S.Ct. at 1838; *see also* Wang Labs.,

Inc. v. Mitsubishi Elecs. America, Inc., 103 F.3d 1571, 1577-78 (Fed.Cir.) ("Prosecution history estoppel ... preclud[es] a patentee from regaining, through litigation, coverage of subject matter relinquished during prosecution of the application of the patent."), *cert. denied,* 522 U.S. 818 (1997).

B. '*359 and* '731 Patents

Plaintiff asserts that the PSC's Duet and VS800 infringe claims 1, 2, 5, 6, 7, 9, 11, 12, 13, 14, 15 and 16 of the '731 patent. The parties concede that claim 1 of the two patents is the only independent claim, and that all of the other claims of the patent are dependent upon claim 1.FN4 With respect to claim 1, there is no dispute that defendant PSC's devices meet limitations 1-11. *See* Pl.'s '359/'731 Markman Br. at 13-17, n. 5-14 (citing Ahten Depo. 10/15/01 & 10/18/01, Pl.'s App. Ex. 7, at 68-128). Thus, for purposes of claim construction, only the disputed limitations of independent claim 1 will be discussed.

FN4. A dependent claim incorporates all the limitations of the independent claim from which it depends, and a dependent claim will be literally infringed only if every limitation in the independent claim is found in the accused product. *See, e.g.,* Wolverine World Wide, Inc. v. Nike, Inc., 38 F.3d 1192, 1199 (Fed.Cir.1994) ("[I]n order for a court to find infringement, the plaintiff must show the presence of every element or its substantial equivalent in the accused device.").

The issues of claim construction that are in dispute as to claim 1 involve Limitation 12 and Limitation 13, with particular emphasis on the underlined phrases, as follows: FN5

FN5. Number references to limitations coincide with those used by plaintiff in its moving papers, while defendant has referred mainly to the language of the claims.

Limitation 12: Said second optical filter element *cooperating with said first optical filter element so as to form a band-pass optical filtering system* having a narrow wavelength bandwidth positioned about said predetermined wavelength, and passing laser light reflected off said code symbol and having wavelengths only within said narrow wavelength bandwidth;
Limitation 13: And a *scan data processing means* for processing produced scan data indicative of said detected light intensity.

'359 Patent, col. 10-11.FN6
FN6. Reference to the claim or specification language of patents '359 and '731 will be made to the '359 Patent, Pl.'s App. Ex. 2, for the sake of expediency. Patent '731 contains the term "only" in the phrase "passing laser light reflected off said code symbol and having wavelengths only within said narrow wavelength bandwidth" of limitation 12, whereas patent '359 does not contain the term; this difference in wording is not at issue, however. In addition, the other limitations, numbering 1 through 11, of claim 1 are included at the end of this Opinion as Appendix A.

1. "*Cooperating with said first optical filter element so as to form a band-pass optical filtering system*"

Limitation 12 of claim 1, with the disputed terms underlined, provides:

Said second optical filter element *cooperating with said first optical filter element so as to form a band-pass*

optical filtering system having a narrow wavelength bandwidth positioned about said predetermined wavelength, and passing laser light reflected off said code symbol and having wavelengths only within said narrow wavelength bandwidth;

'359 Patent, col. 11, l. 1-8. The parties dispute whether either of the two filters of patents '359 and '751 may exist as a bandpass filter by itself before cooperating with the second filter, as plaintiff argues, or whether neither of the two filters may exist separately and apart from each other before the cooperation gives rise to a narrow bandpass filter, as defendant argues. Plaintiff Metrologic argues that the "cooperating ... so as to form a band pass optical filtering system" term of Limitation 12 should be construed in the following way:

Cooperate here means that the net bandpass optical filtering system should be the combination or cooperation of the light transmission characteristics of the two spatially separated optical filtering elements. Further, this cooperation must result in a narrow bandpass optical filtering system.

Pl.'s '359 & '731 Markman Br. at 18. Thus, plaintiff advances the position that the two filters may consist of band-pass filters which can exist independently prior to cooperation.

Defendant argues that the second filter cannot be a band-pass filter before the cooperation with the first filter. Defendant PSC counters that the term

"[C]ooperating ... so as to form a band pass optical filtering system" should be construed to mean that the first and second filters act together to give rise to a narrow bandpass filter. The two filters must cooperate to create a narrow bandpass filter, which does not exist before this cooperation occurs.

Def.'s '359 & '731 Br. Mot. Partial Summ. J. at 25.FN7 Thus, defendant urges the Court to construe this limitation to mean that neither of the two components may act as a band-pass optical filter independently of the other, prior to the cooperation in forming the filter system. For the following reasons, the Court finds defendant's construction to be correct.

FN7. In the context of its summary judgment motion, defendant PSC contends that the Duet and VS800 devices contain an internal bandpass filter that is capable of existing with or without the first optical filter element (the window), and that the presence of the window has no practical effect on the operation of the internal bandpass filter. *See* Def.'s '359 & '731 Br. Mot. Partial Summ. J. at 36.

Looking at the claim language, the language of claim 1, as it relates to the filters that "cooperate," includes the following limitations which refer to the first and second optical filter elements: FN8

FN8. PSC has disputed neither plaintiff's claim construction of these limitations 2-4 and 10-11, nor that the accused devices meet this limitation.

[A] first optical filter element installed over said light transmission aperture disposed along a laser light return path extending through said light transmission aperture, and having wavelength-selective filtering characteristics in the visible band, said first optical filter, element functioning as a scanning window in said compact housing, and preventing light having wavelengths up to slightly below a predetermined wavelength in said visible band from passing from the outside of said compact housing, through said scanning window,

and into said compact housing; ...
'359 Patent, col. 10, 11. 30-40. The claim additionally describes the second filtering element as:
[A] second optical filter element, spatially separated from said first optical filter element, disposed along said laser light return path between said first optical filter element and said laser light detection means, and having wavelength-selective filtering characteristics in said visible band....

'359 Patent, col. 10, 1. 64-col. 11, 1. 12. The claim language provides for the first filter to prevent light having wavelengths up to a predetermined wavelength, which indicates that the first filter may be a band-pass filter which blocks out ambient light on only one side of the visible spectrum. That the second filter is spatially separated from the first filter and has wavelength-selective characteristics in the visible band is not determinative of the issue whether the two filters must cooperate together before they can form a narrow band-pass filter.
Turning to the claim's specification, and focusing on it within the context of the invention, the Summary of the Present Invention provides for the first optical filter to transmit only light having wavelengths from below a predetermined wavelength and greater, whereas the second element is capable of transmitting light having wavelength from slightly above a predetermined wavelength and below:

[T]he first optical filter element is installed over the light transmission aperture of the scanner housing, and has wavelength selective properties which transmit only light having wavelengths from slightly below a predetermined wavelength in the visible band of the electromagnetic spectrum (*e.g.,* slightly below 670 nanometers and greater). The second optical filter element is installed within the housing, ..., and transmits only light having wavelengths from slightly above the predetermined wavelength (*e.g.,* slightly above 670 nanometers and greater [sic]). Collectively, the first and second optical filter elements cooperate to form a narrow wavelength band-pass filtering system centered about the predetermined wavelength....

'359/'731 Patent, col. 3, 11. 17-28.

Other parts of the specification language also refer to the ability of the first filter element transmitting wavelengths of only slightly below 670 nanometers and greater, and the ability of the second filter element to transmit only wavelengths only slightly above 670 nanometers and below, to cooperate to form a narrow wavelength band-pass filtering system that rejects wavelengths outside this spectral band of scanned laser beam. Id. col. 3, 11. 25-35; id. col. 6, 11. 50-52; id. col. 8, 11. 49-53, id. col. 9, 11. 23-27.

Defendant relies upon Figure 3 of the patent, *see* '359 patent, Pl.'s App. Ex. 2,FN9 which displays a transmission curve. This transmission curve, according to defendant, shows the cooperation between a high pass and a low pass filter. The graph indicates transmission of wavelengths of a high pass and low pass filter separate and apart from the combination of the two filters. The specification states that the graph is a schematic representation graphically illustrating how the spectral transmission characteristics of these spatially-separated optical filter system elements cooperate to produce a narrow-band optical filter system centered about the characteristic wavelength of the visible laser scanning beam. '359 Patent, col. 4, 11. 9-16. The description provided here, as in the other language of the specification, supports PSC's construction that the two filters are not each a band-pass filter, but that the two filters are comprised of a high pass filter and a low pass filter, centered about a predetermined wavelength near a predetermined wavelength, each filter filtering out light of wavelengths on either side of the spectrum.

FN9. This graphic was referred to earlier as Pl.'s Markman Hrg. Ex. 1 (attached hereto as Appendix E).

Consideration of the prior art supports the conclusion that neither of the two filters is a band-pass filter independently. Defendant PSC argues that the references to the internal one-piece band-pass filter throughout the specification of the patents is clear acknowledgment of the prior art, and that the patent cannot be construed so broadly as to encompass this disclosed prior art, citing to *Wang Labs*., 197 F.3d at 1382 (concluding that references to prior art was not considered an enlargement of the patent's invention). Here, the specification repeatedly contrasts the combination of the first and second filter elements, in the present invention, from the system used in prior art devices, emphasizing the "novel laser scanner construction" in which the second filter element is spatially separated from the larger first filter element, which is located at the light transmission aperture and is semi-transparent in order to hide the components from plain view. That the first filter transmits red light, at approximately 640 nanometers, allowing higher wavelength lights to pass through and thereby appearing red itself, supports this conclusion. Markman Hrg. Tr. 8/6/02, at 19. The specification refers to these two filter elements as an improvement upon the problems of prior art, in terms of manufacturability, and in terms of its ability to shield its components from plain view:

A further object of the present invention is to provide such a laser bar code symbol scanner, in which the wavelength selective components of the optical filter system are strategically installed in a spatially-separated manner in order to achieve improved scanner performance, appearance, and manufacturability, in a simple low-cost manner.

A further object of the present invention is to provide such a laser bar code symbol scanner in which the optical filtering system employed therein inherently hides from view, unappealing electro-optical components mounted within the laser scanning housing, while rejecting unwanted spectral noise outside the narrow spectral band of the laser scanning beam.

'359/'731 Patent, col. 2, 11. 45-56. Furthermore, the specification refers to the first filter, transmitting red light and light of higher wavelengths, and the second filter, referred to as "relatively small," as representing a "significant advance in the state of the art in laser scanner design and construction." '359/'731 Patent, col. 3, 11. 45-53. The continuous references to the invention as an improvement upon prior art devices in terms of manufacturability, and the spatial separation of the two filters, one of which is relatively smaller, the other which hides internal components from view due to its transmission of wavelengths of red light, support the construction that neither of the two filters is independently a band-pass filter that encompasses the characteristics of both a high-pass and a low-pass filter.

The prosecution history supports the finding that the limitation of this scope refers to filters with the selective wavelength capability, and that each is not a one-piece internal band-pass filter. The Supplemental Preliminary Amendment refers to the "simple and inexpensive" way of making a laser bar code scanner that resolves some of the problems encountered by prior art devices. *See* Supp. Prelim. Amendment, Palmer Decl., Pl.'s '359/'731 Br. Ex. K, at 1, 20. The Response to Office Action and Amendment also refers to an interview with inventors Thomas Amundsen and George Rockstein, who "demonstrated how the laser scanning system of the claimed invention effectively solves such problems in an inexpensive manner." Resp. to Office Action & Amendment, Palmer Decl., Pl.'s '359/'731 Br. Ex. K, at 1, 4-5. The two amendments thus refer to the improved cost of manufacturability of the patent, compared to the prior art devices which encountered high costs due to the singularity of the internal band-pass filter pieces. It can again be inferred that the purpose of the invention is to combat previous problems with prior art devices, which utilized the more expensive one-piece filter system design.

In conclusion, the specification language throughout the patent indicates that each of the two filters covers only part of the visual spectrum of colors, either just under and greater than 670 nanometers, or just above and less than 670 nanometers. Nowhere in the specification does the language discuss the ability of either filter component to block out ambient light measuring *both* above and below the 670 nanometer range. The specification readily distinguishes plaintiff's invention from internal band-pass filters of prior art devices in discussing the patent's novelty and in its overcoming the problems of laser scanners with its aesthetic appearance and the invention's use of the first optical filter element which is in the form of a red window.

This case does not resemble one in which the parties dispute the meaning of a term. Rather, this case involves the imputation of a requirement upon the terms of the claim. Much like *Bell Atlantic,* which construed the term "mode" to refer only to three possible modes as referred to throughout the specification, the patentee has defined the term "by implication, through the term's consistent use throughout the [ ] patent specification." Bell Atlantic Network Servs., Inc. v. Covad Communications Group, 262 F .3d 1258, 1273 (Fed.Cir.2001) (citing Vitronics, 90 F.3d at 1582). The consistent use of the two filter elements as pertaining to filters with the capability of transmitting certain wavelengths of light, either above or below the predetermined wavelength of the laser light, indicates that neither of these two elements constitutes an internal band-pass filter that is capable of blocking out ambient light with wavelengths both above and below the predetermined level. Plaintiff's novel invention of spatially-separated filters, which was meant to solve the problems encountered by one-piece band-pass filters in the prior art, would be turned on its head if it were allowed to disregard the exact distinction it meant to create by the novel invention presented in its patent. This Court recognizes that "there is sometimes 'a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification." ' Bell Atlantic, 262 F.3d 1258, 1270 (Fed.Cir.2001) (quoting Comark Communications, Inc. v. Harris Corp., 156 F.3d 1182, 1187 (Fed.Cir.1998)). However, in light of the consistent language of the claim and the specification, and the prosecution history, indicating the intent of the patent holder to improve upon the poor manufacturability and transparency of the prior art, the term " *cooperating with said first optical filter element so as to form a band-pass optical filtering system* " is construed to mean *the cooperation of the two band-pass filters, neither of which is itself a narrow bandpass filter. The two filters, one of which transmits light of wavelengths just below and above a predetermined wavelength, the other transmitting light of wavelengths just above and below the predetermined wavelength, cooperate to form a narrow band-pass optical filter which does not exist before the cooperation between the two filters*. The claim is not entitled to a broader scope.

2. "*Scan data processing means*"

Limitation 13 of claim 1, with the disputed term underlined, provides as follows:

And a *scan data processing means* for processing produced scan data indicative of said detected light intensity.FN10

FN10. Patent '359 inserts the word "code" in its claim limitation: "a scan data processing means for processing produced scan data code indicative of said detected light intensity." Patent '359, col. 10, 11. 24-25. The addition of this word is not at issue in this case.

Pl.'s '359 & '731 Markman Br. at 13. The disputed issue as to Limitation 13 is whether the "scan data

processing means" consists of only an amplifier and A/D conversion circuit, as plaintiff maintains, or whether it includes the amplifier, the A/D conversion circuit, a bar code detection module, a bar code scan range detection module, symbol decoding module, and data format conversion module, as defendant asserts. Plaintiff Metrologic construes "scan data processing means" of Limitation 13 in the following way:

The Spatially Separated Filter Patents describe two different sets of structures that process the scan data. An amplifier 55 performs the processing function of amplifying the analog signal from the photodetector and the A/D conversion circuit 13 converts the analog signal to a digital signal. Accordingly, an infringing device[ ] must perform the processing function recited by this limitation using structures that are the same as or equivalent to these structures.

Pl.'s '359 & '731 Markman Br. at 21.

According to PSC, the "scan data processing means" should be construed as follows:

Microprocessor and software code with the functionality of blocks 13, 14 and 15 of Figure 4 together with the system controller 22. Consequently, the scan data processing means includes structure that detects the presence of a bar code (block 14) before decoding the bar code.

Def.'s Markman Presentation, Slide 98.

Here, because the "scan data processing means" limitation is written in a means-plus-function language, the first step in construing such a limitation is to identify the function of the means-plus-function limitation, and then to identify the corresponding structure in the written description necessary to perform that function.FN11 *See* Texas Digital Sys., Inc. v. Telegenix, Inc., 308 F.3d 1193, 1208 (Fed.Cir.2002), *cert. denied,* 123 S.Ct. 2230 (2003).

FN11. In the context of its motion for partial summary judgment, PSC asserts its devices do not perform the identical function because they do not contain a bar code presence detection module.

In this case, the language of the claim provides for a "*scan data processing means* for processing produced scan data indicative of said detected light intensity." According to the claim language, the function of the "scan data processing means" is to process produced scan data indicative of detected light intensity. This implies that the scan data that is processed is produced and indicates the light intensity of the wavelength being scanned.

Two types of scan data, analog and digital, are found in Figure 4 of the patent, which provides an illustration of the principal components of the device. '359/'731 Patent, col. 4, ll. 18-22; '359/'731 Patent, Fig. 4 (attached hereto as Appendix H). The specification provides for the converter 13 to convert the analog signal to digital signal: "As illustrated in FIG. 4, analog scan data signal D_1 is provided as input to A/D conversion circuit 13 ." Id. at col. 6, ll. 62-63. As indicated by Figure 4, the line D_1 which extends from the amplifier to the A/D Conversion Circuit 13, is a signal containing analog scan data. This analog scan data is then processed in the conversion circuit, as mentioned above: "As is well known in the art, A/D conversion circuit processes analog scan data signal D1 to provide a digital scan data signal D2...." '359 Patent, col. 6, 1. 62-col. 7, 1. 2. The specification further indicates that signal D1 is "indicative of detected light intensity" in explaining the procedure for laser light reflected from a bar code signal to be inputted into the photo

receiver circuit: "Upon detection of this scan data signal, photo-receiving circuit 12 produces an analog scan data signal D1 indicative of the detected light intensity." '359 Patent, col. 6, ll. 43-45. Thus, because scan data is processed here, a structure that is the same as or equivalent to the A/D conversion circuit 13 is included within the means of such a function, and neither party disputes its inclusion within the means.

Plaintiff further argues that the Amplifier 55 is included within the structure for the means because amplifier 55 performs the processing function of amplifying the analog signal from the photodetector, citing to the specification language, which provides that "[p]hotoreceiver 54, in turn, produces an analog signal which is subsequently amplified by preamplifier 55 to produce the analog scan data signal D1." '359/'731 Patent, col. 6, ll. 52-55. Because amplifier 55 assists in producing the scan data signal D1 by amplifying the analog signal, which is indicative of light intensity, plaintiff asserts that a structure that is the same as or equivalent to the amplifier 55 and A/D conversion circuit 13 is claimed.

Defendant argues that the "scan data processing means" consists of A/D conversion circuit 13, Bar Code Presence Detection Module 14, Bar Code Scan Range Detection Module 15, and System Controller 22. The specification language explains that "scan data" occurs from the following:

[S]canning is achieved with a laser light beam so that scan data can be collected for detecting the presence of a bar code within the scan field, and subsequently reading (i.e., scanning and decoding) the detected bar symbol.

'359/'731 Patent, col. 5, ll. 1-5. As indicated by the specification, the laser light reflected off the bar code is described in the patent as a "scan data signal" that is first received by the photoreceiver, i.e., the photodetector. Id. col. 6, ll. 37-43. "Upon detection of this scan data signal, photoreceiving circuit 12 produces an analog scan data signal D1 indicative of the detected light intensity." Id. at ll. 43-45. This signal D1 is then converted into digital scan data signal D2. Id. at ll. 62-67.

Defendant argues that all the modules to which the digital scan data D2 is provided, including the bar code presence detection module, bar code scan range detection module and symbol decoding module, process this scan data. As shown by Figure 4, D_2 is digitized scan data from the A/D Conversion Circuit 13 that is provided directly to the Symbol Decoding Module 16 and the Bar Code Detection Module 14, from which the data is then provided to Bar Code Scan Range Detection Module 15. The specification states, "As illustrated hereinafter, these scan data signals *are used* by bar code presence detection module 14, bar code scan range detection module 15 and symbol decoding module 16." '359 Patent, col. 6, ll. 58-61 (emphasis added). The specification refers to D2 as the input signal provided to these components: "Digitized scan data signal D2 is provided as input to bar code presence detection module 14, bar code scan range detection module 15 and symbol decoding module 16." Id. at col. 7, ll. 3-6.

With respect to the functions of these components, the specification provides that module 16 processes D2:

The function of symbol decoding module 16 is to process scan line by scan line, the stream of digitized scan data D2, in an attempt to decode a valid bar code symbol within a predetermined time period allowed by the system controller.

'359/'731 Patent, col. 7, ll. 32-33. Decoding module 16 processes scan data D2 to produce symbol character D3: "When the symbol decoding module successfully decode a bar code symbol within the predetermined time period, symbol character data D3 (typically in ASCIII code format) is produced corresponding to the

decoded bar code symbol." Patent, col. 7, ll. 38-39. D3 thus corresponds to symbol character data which is produced by the Symbol Decoding Module 16, and is inputted into the Data Format Conversion Module 17. Module 16 thus processes scan data by intaking D2 and thereafter produces symbol character D3.

On the other hand, although defendant asserts bar code presence detection module 14 processes produced scan data, the specification demonstrates that the purpose of module 14 is to detect a bar code, not to carry out a decoding process:

[T]he purpose and function of bar code presence detection module 14 is to determine whether a bar code is present or absent from the scan field over time intervals specified by the system controller....

The function of the bar code presence detection module is not to carry out a decoding process but rather to simply and rapidly determine whether the received scan data signals produced during bar code presence detection, represent a bar code symbol residing within the scan field.

'359/'731 Patent, col. 7, ll. 7-22 (emphasis added).

Defendant asserts that dependent claim 17 of the '359 Patent and the dependent claim 16 of the '731 Patent each claim the laser code scanning system of claim 1, in which the scan data processing means "further comprises" the symbol decoding module 16, thereby meaning that the scan data processing means of claim 1 includes Bar Code Presence Detection Module 14, Bar Code Scan Range Detection Module 15, together with the System Controller 22. That dependent claim provides for:

The laser code symbol scanning system of claim 1 wherein said data processing means[s] further comprises means for producing symbol character dat[a] representative of said scanned code symbol.

'359 Patent, claim 17; '731 Patent, claim 16. Thus, although defendant relies on module 16 as structure that processes the scan data, it argues that the corresponding structure of the means-plus-function limitation refers to all components involved in the scan data processing leading up to module 16, that is, blocks 13, 14, 15 and system controller 22. Def.'s '359/'731 Summ. J. Br. at 17.

Thus, PSC argues that the necessary structure includes a microprocessor and associated programming, because the specification provides:

[S]ystem controller 22, bar code present detection module 14, bar code scan range detection module 15, symbol decoding module 16, and data format conversion module 17 are realized using a single programmable device, such as a microprocessor having accessible programming and buffer memory, and external timing means.

'359/'731 Patent, col. 5, ll. 55-60. PSC neither advances nor explains the relevance of module 17 to the function of the means-plus-function limitation to process produced scan data indicative of light intensity. The only reference to module 17 in the specification is that it converts D3 into two differently formatted types of symbol character data D4 and D5. Id. col. 7, ll. 48-51. There are further references to D3, D4, and D5 as "symbol character data," *see* col. 7, ll. 37, 49, 50-54. If defendant's theory is extrapolated, all data D2, D3, D4, and D5, which derive from D1, would constitute "scan data indicative of said detected light intensity," and all components which process such data, including the conversion circuit 13, the bar code presence detection module 14, the bar code scan range detection module 15, symbol decoding module 16,

data format conversion module 17, data storage unit 18, data transmission circuit 19, and system controller 22 would comprise the "scan data processing means." While PSC initially relies on the digital scan data D2 as the produced scan data indicative of light intensity that is processed by these components, defendant attempts to rely on D3 as scan data processed by the corresponding structure, yet makes no distinction between the symbol character data D3, D4, and D5. PSC's argument that the structure corresponds to the microprocessor including all of the above identified components (exclusive of module 16), which apparently process D1, D2 and D3, yet not D4 and D5, is not supported by the claim or specification language.

The prosecution history supports a construction in which A/D conversion circuit 13 and amplifier 55 constitute the means. Prior to amendment on December 20, 1996, claim 1 of the patent read, in pertinent part, as follows: "a scan data processing means for processing produced scan data so as to decode said scanned code symbol and produce symbol character data representative of the decoded code symbol." Response to Office Action Amendment, Palmer Decl. Ex. L, at 3. By amendment dated December 20, 1996, plaintiff deleted the quoted language reading "so as to decode said scanned code symbol and produce symbol character data representative of the decoded code symbol" and added language so that the claim read: "as scan data processing means for processing produced scan data indicative of said detected light intensity." Id. Metrologic then added a separate dependent claim, now claim 17, with language similar to that which had been deleted from claim 1, reading: "The laser code symbol scanning system of claim 1 wherein said scan data processing means further comprises means for producing symbol character data representative of said scanned code symbol." Id. at 4. Plaintiff thus argues that the file history indicates plaintiff did not consider the function of decoding the digital signal to be a key or necessary part of the invention.

Although defendant cites *Wang Laboratories,* 197 F.3d at 1384, for the contention that the claim 1 must be construed to include everything that was in the claim before the last element was deleted, *Wang Laboratories* discusses, rather, that a distinction made on a parent application properly applied to the common subject matter of the instant invention. Whether plaintiff must be held to language it had omitted in the prosecution history of the patent is not resolved by *Wang Laboratories*. Plaintiff asserts that by amending claim 1 as referenced above to reflect the "scan data processing means" was processing scan data indicative of light intensity, the processing in claim 1 is directed to the analog processing rather than decoding the digital signal. As the Supreme Court recently stated, with respect to amendments, that "[w]hile the patentee has the right to appeal, his decision to forego an appeal and submit an amended claim is taken as a concession that the invention as patented does not reach as far as the original claim." Festo Corp. v. Shoketsu, Kinzoku Kogyo Kabushiki Co., Ltd., 535 U.S. 722, 734 (2002). "[B]y the amendment [the patentee] recognized and emphasized the difference between the two phrases [,] ... and the difference which [the patentee] thus disclaimed must be regarded as material." Festo, 535 U.S. at 734 (quoting Exhibit Supply Co. v. Ace Patents Corp., 315 U.S. 126, 136-37 (1942)).

To the extent that plaintiff amended claim 1, deleting language that appears in the added claim 17, that which is disclaimed cannot be considered part of claim 1. The patentee's amendment thus indicates a concession that the patent as amended does not reach as far as the original claim. This provides support that claim 1 did not include a means which function is to "produc[e] symbol character data representative of said scanned code symbol." Furthermore, the language of claim 17 claims a structure that provides "means for producing symbol character data representative of said scanned code symbol." The language in the specification supports the conclusion that a structure corresponding to claim 17 would necessarily produce character data D2, D3, D4 and D5.

Although defendant claims that the specification, prosecution history and extrinsic evidence support its construction, relying on the history of plaintiff's expert Dr. Daut's opinions, as indicated in his expert report, deposition, and in counsel's attempt to clarify plaintiff's interpretation in a subsequent letter, *see* Daut Report, Palmer Decl. Ex. Z; Daut Dep. Tr. 4/24/02, Palmer Decl. Ex. AA, at 239 ("Scan data processing means would be the photoreceiver, the amplifier and A to D conversion component producing scan data indicative of said light intensity."); Daut Depo. 4/25/02, Palmer Decl. Ex. BB, at 253 ("The scan data processing menas identify the preamplifier 55 and A to D conversion circuit item 13."); Weider Letter, 5/7/02, Palmer Decl. Ex. CC ("The scan data processing means ... refers to any structure that is the same as or equivalent to the amplifier 55 and/or the A/D conversion circuit 13."), it is well established that the Court first looks to the intrinsic record, that is, the claims, specification and file history, in construing the claim. Extrinsic evidence, including expert testimony and inventor testimony, may only be used where an ambiguity exists, and may be used only to help the Court come to a proper understanding of the claims, but may not be used to vary or contradict the claim language. Victronics, 90 F.3d at 1584 (citing Markman, 52 F.3d at 981). As the Federal Circuit stated,

The claims, specification, and file history, rather than extrinsic evidence, constitute the public record of the patentee's claim, a record on which the public is entitled to rely.... Allowing the public record to be altered or changed by extrinsic evidence introduced at trial, such as expert testimony, would make this right meaningless.

Victronics, 90 F.3d at 1583 (citing Markman, 52 F.3d at 978-79; *Southwall,* 54 F.3d at 1578). In this case, absent an ambiguity, the Court relies upon the claim language, specification, and prosecution history for the construction of the claims, and need not resort to alleged inconsistencies in Dr. Daut's deposition testimony.FN12

FN12. The Court is also counseled by plaintiff's position that "functional limitations that are not recited in the claim, or structural limitations from the written description that are unnecessary to perform the claimed function are not to be imported into the claim." Wenger Mfg., Inc. v. Coating Mach. Sys., Inc., 239 F.3d 1225, 1233 (Fed.Cir.2001). In *Wenger,* the district court had interpreted the "air circulation means" limitation as requiring structure capable of recirculating air. The Federal Circuit stated that, under s. 112, para. 6, "a court may not import functional limitations that are not recited in the claim, or structural limitations from the written description that are unnecessary to perform the claimed function." Wenger, 239 F.3d at 1233 (citing Micro Chem., Inc. v. Great Plains Chem., Co., 194 F.3d 1250, 1258 (Fed.Cir.1999)). Although the district court correctly identified the function as "circulating air," the Federal Circuit found that it erred by improperly restricting the "air circulation means" limitation to a structure that was disclosed in the preferred embodiment, but was not necessary to perform the recited function of circulating air. In this case, where the function is "processing produced scan data indicative of light intensity," the Court is mindful to construe the structure with respect to performing the recited function, not limiting it according to the preferred embodiment.

After consideration of the claim language, specification and the prosecution history, the Court construes the claim "scan data processing means" to mean that *its function is to process scan data indicative of said detected light intensity, and that the corresponding structures are A/D Conversion Circuit 13 and Amplifier 55.*

C. '852 Patent

The '852 patent is directed to a bar code scanner that sits atop a counter and projects a pattern of light, the cross-section of which is patterned. The light projected from the scanner is omnidirectional, *i.e.,* there are many lines of light projected from many angles within that volume of light. The light projecting outward is composed of dense, omnidirectional crisscrossed scan lines. The result is that bar code symbols placed in front of the scanner will be read by the scanner irrespective of how the bar code symbol facing the scanner is positioned, whether vertically, horizontally, or somewhere in between.

Claim 1 is the only independent claim of patent '852. Claim 1 contains 17 limitations; however, only limitations 2, 13, and 15 are at issue in this claim construction.FN13 The limitations of claim 1 at issue are the following phrases, with the disputed terms underlined:

FN13. The limitations of Claim 1 of Patent '852 are included in Appendix B, attached herein.

Limitation 2: *an optical bench mounted in [a] compact housing* and extending along a central reference axis.
Limitation 13: a "*highly collimated projected scanning pattern*" as used in, e.g., a "highly collimated projected scanning pattern within [a] narrowly confined scanning volume";

Limitation 15: a " narrowly confined scanning volume" as used in, e.g., "a narrowly confined scanning volume extending from adjacent said light transmission window to at least about six inches therefrom";

1. ***An optical bench mounted in said compact housing and extending along a central reference axis***

As for the above term, the parties agree on what constitutes a compact housing, *see* Pl.'s '852 Markman Br. at 9, as well as what constitutes an optical bench. *See* id.; *see also* Palmer Rebuttal, at 23. The issue in dispute is whether the optical components must be mounted on a separate structure that is attached to the housing by some fastening means, as defendant asserts, or whether the optical bench can be a rigid structure within the housing of the scanner to which the optical components are mounted on the housing itself to prevent movement of the individual optical components relative to each other, as plaintiff argues. Plaintiff's construction is found to be correct for the following reasons.

Plaintiff construes the term "optical bench" as requiring that "the device have a rigid fixed structure to which the optical components are mounted. An optical bench is generally understood to be one of ordinary skill in the art as a rigid structure to which optical components are mounted." Pl.'s '852 Markman Br. at 9. Plaintiff argues that the limitation simply requires that "there be a rigid structure within the housing of the scanner to which the optical components are mounted to prevent movement of the individual optical components relative to each other." Id. at 10. Plaintiff further identifies the back wall of the housing as a rigid structure to which the optical components can be mounted.

Defendant PSC construes this term as requiring two structures: an optical bench and a housing that are interconnected in a particular way. Def.'s '852 Br. Mot. Partial Sum. J. at 32. Defendant construes the claim as specifying a further structural relationship between these two elements, namely, that the optical bench must be mounted in a specific way to the housing. *See* id. Specifically, defendant provides the following definition of "optical bench mounted in a compact housing":

[T]here are two distinct structures-an optical bench and a compact housing-that are interconnected in

particular manner, through mounting. The optical bench is mounted in the compact housing. The optical bench itself is a flat, rigid piece of metal (or similarly dimensionally-stable material) to which optical components are mounted.

PSC Markman Presentation, Ex. 65. Defendant maintains that the optical components must be mounted on a separate structure that is attached to the housing by some fastening means, citing the specification, which provides that "optical bench 74[is] mounted via fasteners 76, on the inside surface of the rear wall 50 of the housing section 64 (see FIG. 3.)" '852 Patent, col. 7, 11. 13-14.

Plaintiff argues that those of ordinary skill in the art recognize that an optical bench is any rigid structure for mounting optical components. In response to defendant's argument with respect to the specification language, plaintiff asserts that the embodiment depicted in the patent simply represents one way of fixing optical components within the housing, and thus the embodiment shown in the '852 patent should not be read into the claims as requiring that the optical bench be a separate structure attached to the housing using fasteners.

The claim language of Limitation 2 provides for "an optical bench mounted in said compact housing and extending along a central reference axis[.]" '852 Patent, col. 11, 11. 43-45. The specification language regarding the optical bench provides:

The optical bench 74 as clearly seen in FIGS. 2-4 is a generally *rectangular, plate-like member* which includes a flange extending along its two side edges and along its bottom edge.

'852 Patent, col. 7, 11. 36-39 (emphasis added). The specification also refers to the optical bench in discussing the method by which a laser beam is produced and swept across the optical components in the housing:

The means for producing the beam, focusing it, sweeping it through the housing, folding it and directing it out of the housing window are all mounted on *an optical bench mounted via fasteners 76* on the inside surface of the rear wall 60 of housing section 64 (see FIG. 3).

See id. at col. 7, 11. 11-16 (emphasis added). This language raises a question as to whether the optical bench is attached to the housing via fasteners, or whether the "means for producing the beam" are mounted to the optical bench via fasteners, due to the positioning of the words in the specification. Additional specification language provides the following:

All of the mirrors are of generally planar and are mounted on the optical bench 74 adjacent the polygon 42 and under the window 30. In particular the mirrors 82-90 are mounted via a spider member 116 having five angled brackets 118, one for each mirror. *The spider 116 secured to the optical bench 74 via the fasteners 76*. Preferably the mirrors 82-90 are glued in place on the spider's brackets 118.

'852 Patent, col. 8, 11. 21-29 (emphasis added). This language creates the implication that the mirrors 82-90 are included within the "means for producing the beam, focusing it, sweeping it through the housing, folding it and directing it out of the housing window." The specification language indicating that the fasteners 76 fasten these mirrors to the optical bench 74 necessarily implies that the fasteners 76 in the earlier passage of the specification functioned to fasten the "means for producing the beam" to the optical bench, not to fasten the optical bench to the housing.

As defendant pointed out at the *Markman* hearing, the specification further describes that certain components are mounted or fixedly mounted onto the optical bench:

The details of the reflecting means made up of mirrors 82-90 will now be described. All of the mirrors are of generally planar and are *mounted* on the optical bench 74 adjacent the polygon 42 and under the window 30.

'852 Patent, col. 8, 11. 20-24 (emphasis added).

The laser diode 78 is *fixedly mounted* on the optical bench adjacent the bottom edge flange and is oriented parallel to the bench so that it projects a laser beam 48 parallel to the optic bench and in a transverse direction, that is parallel to the transverse axis 34 of the window 30.

Id. col. 7, 11. 40-44 (emphasis added).

The polygon is mounted on the rotary output shaft of a motor 112 which is *fixedly mounted* on the optical bench so that its rotation axis 44 intersects an axis 114.

Id. col. 7, 11. 55-57 (emphasis added).

The focusing lens 96, as can be seen in FIGS. 2-4 is mounted opposite the collecting mirror along central longitudinal axis 114 and above the polygon 42. *The means for mounting the focusing lens at that position comprises a bracket 124 fixedly secured to the front portion of the optical bench 74.*

Id. col. 9, 11. 38-44 (emphasis added). The specification language referring to optical components being mounted, fixedly mounted, or fixedly mounted to the optical bench by use of a bracket, supports the conclusion that the preferred embodiment of the patent clearly envisioned the use of brackets or fasteners to mount certain components to the optical bench. This language in no way, however, refers to the mounting of the optical bench to the compact housing. Contrary to defendant's argument, the specification language further supports the reference of fasteners or brackets in the patent to mounting the components involved in producing and focusing the beam onto the optical bench, not for mounting the optical bench inside the compact housing.

In considering the claim language and specification language, there being no relevant prosecution history either raised by the parties or found in the parties' submissions, the term "optical bench mounted in said compact housing" is construed as *a rigid structure within the housing of the scanner to which optical components are mounted to prevent movement of the individual optical components relative to each other.* There is no requirement that the optical bench be mounted to the compact housing by fasteners or brackets.

2. "*Highly collimated projected scanning pattern*"

Plaintiff Metrologic argues that "highly collimated" refers to the requirement that the infringing device must have a rich pattern into which bar coded items can be presented for reading irrespective of orientation. *See* Pl.'s '852 Markman Br. at 13. Plaintiff asserts that this construction follows directly from the language in Limitation 15 which reads "the code symbol is scanned omnidirectionally by said highly collimated scanning pattern...." '852 Patent, col. 12, 11. 53-54. In addition, as discussed below, plaintiff relies upon the

file history of the '232 patent, a parent application to the '852 patent.

PSC construes "highly collimated" to mean that the rays of light must be made as close to parallel as possible. Defendant asserts that this limitation should be construed to mean that the "scan pattern [ ] changes as little as is practically possible in size and shape over the entire range of distances from the window of the scanner over which a bar code may be read." Def.'s '852 Br. Mot. Summ. J. at 18. Thus, defendant contends, the size and shape of the pattern varies very little throughout the entire operating range of the scanner, thereby creating a column-like pattern as it is projected out of the scanner. Id. at 18-19. Plaintiff specifically contests PSC's construction that the rays of light be "as close to parallel as possible," stating that the "highly collimated" phrase refers to a "rich set of lines in which a bar code can be read omnidirectionally." Pl.'s '852 Markman Br. at 14.

The Court herein reviews the claim language, the specification, and the prosecution history. The claim language of patent '852 states:

(h) control means within said compact housing for controlling the operation of said counter-top projection laser scanner so that, during scanner operation, the laser beam produced from said laser beam producing means passes along a portion of said central reference plane, to the first, second and third rotating light reflective surfaces of said laser beam sweeping means, and as the laser beam sequentially reflects off said first, second and third rotating light reflective surfaces, the laser beam is repeatedly swept across said first, second, third, and fourth and fifth stationary light reflective surfaces thereby producing first, second, third, and fourth and fifth groups of plural scan lines, respectively, which are projected out through said light transmission window and intersect about a projection axis within a narrowly confined scanning volume extending from adjacent said light transmission window to at least about six inches therefrom so as to produce a *highly collimated projected scanning pattern* within said narrowly confined scanning volume,....

'852 Patent, col. 12, 11. 26-45. The contours of the phrase "highly collimated projected scanning pattern" is given by the claim language directly preceding it. The "projected scanning pattern" encompasses five groups of plural scan lines, created by passing a laser beam off a central reference plane, and sweeping the laser beam off of three rotating light reflective surfaces and five stationary light reflective surfaces. These five groups of plural scan lines are projected out through the light transmission window about six inches or so and intersect about an axis. Reference to the "highly collimated projected scanning pattern" being produced within said "narrowly confined scanning volume" and extending to at least six inches from the light transmission window indicates that the pattern is projected within the narrow volume of light emitted from the scanner. Because the pattern is confined to this volume, yet is at least half a foot in length, this falls in favor of construing the term "collimated" to mean that the projection of the scanning pattern is columnar, rather than that it encompasses a rich pattern of scan lines, thereby allowing items to be read omnidirectionally, as proposed by plaintiff.

Subsection (i) of claim 1 also refers to the "highly collimated scanning pattern" as being "within" the "highly collimated scanning volume." This claim language provides:

[S]aid compact housing being supportable relative to a counter-top surface so that, during scanner operation, said *highly collimated scanning pattern is projected* above said counter-top surface *within said highly collimated scanning volume ....*

'852 Patent, col. 12, 11. 46-50 (emphasis added). That the term "highly collimated" describes both the

scanning pattern as well as the scanning volume indicates reference to the shape of both the volume and the pattern, not that the term refers to a rich set of lines in which a bar code can be read omnidirectionally. Additionally, subsection (h)'s reference to the scanning volume as a "narrowly confined scanning volume," '852 Patent, col. 12, 11.44-45, indicates the interchangeability of the terms "highly collimated" and "narrowly confined," and creates the strong implication that the term "highly collimated" refers to the columnar nature of both the volume and the projected pattern.

That the term "highly collimated" refers to the projected scanning pattern being as parallel as is possible is supported by the ordinary dictionary definition of the term "collimated." The ordinary meaning of the term "collimated" is "to make (as light rays) parallel," Merriam-Webster's Collegiate Dictionary (1993), Palmer Decl. Ex. D; Def.'s Markman Ex. 34, the term "highly collimated" refers to a shape in which the light rays are as parallel as possible. The McGraw-Hill Dictionary on Scientific and Technical Terms also defines a "collimated beam" as a "beam of radiation or matter whose rays or particles are nearly parallel so that the beam does not converge or diverge appreciably." Hyun Decl. para. 11.

Plaintiff Metrologic argues that the dictionary definition in and of itself does not give meaning to the term "highly collimated," and that the plaintiff is its own lexicographer. If plaintiff is its own lexicographer, its definition must be "clearly stated in the patent specification or file history." Victronics, 90 F.3d at 1582 (citing Hoechst Celanese Corp., supra, 78 F.3d at 1578). Although plaintiff urges this Court to construe "highly collimated" to refer to a rich set of lines in which bar code items can be presented and read in varying orientations, there is no definition to this effect in the specification, claim language, or file history.

Rather, with respect to the rich set of scan lines, the description of the preferred embodiment in the specification provides:

The scanning pattern of the subject invention is confined within a relatively narrow, yet diverging volume centered about a projection axis from the scanner (as will be described later) and includes plural groups of intersecting scan lines to create a "rich" pattern. This "rich" pattern ensures that sufficient lines of the pattern will sweep across the entire bar code to enable the proper reading or decoding thereof by conventional decoding means located within the scanner 20, irrespective of the orientation of the bar code within the scanning pattern. Moreover, by virtue of the fact that the volume or space in which scanning pattern is projected is somewhat narrow or confined, the amount of counter space which must be kept clear of other bar coded items to enable the proper scanning of the selected bar coded item, can be kept to a minimum.

'852 Patent, col. 4, 11. 46-60. While it is true that a purpose of the invention is to scan objects irrespective of their orientation and to prevent unintentional scanning of objects, no reference to "collimated" as being defined by the "rich" set of scan lines is made.

The specification instead supports a construction of "highly collimated" as referring to the columnar nature of the projected scanning pattern, as the Summary of the Invention provides that

The scanning pattern is generally confined within a relatively narrow, yet diverging, volume, e.g., pyramid, cone, frustum, etc., centered about a projection axis which is substantially but not precisely perpendicular to the plane of the window.

'852 Patent, col. 3, 11. 15-20. Moreover, in conjunction with the claim language's usage of the terms "highly

collimated" and "narrowly confined" interchangeably, discussed above, this language implies that the scanning pattern and volume share a "relatively narrow, yet diverging" shape. The specification language also refers to the term "highly collimated" as coterminous with "focused," with respect to the volume: "The highly collimated or focused volume of the scan prevents unintentional scanning of nearby objects." '852 Patent, col. 11, 11. 24-25.

Although defendant argues that "highly collimated" refers to light rays that are as close to parallel as is possible, the Summary of Invention provides that "[t]he scanning pattern comprises plural, e.g., five, groups of plural, e.g., four, parallel scan lines." '852 Patent, col. 3, 11. 8-10. This indicates that the lines included within the scanning pattern consist of groups of scan lines, each individually consisting of parallel lines. The scanning pattern itself contains these groups of parallel lines, and, therefore, may not be completely parallel or linear, as a result of the groups of lines protruding from different angles.

As for prosecution history, defendant PSC counters that there have been 7 rejections by the PTO of the '852 patent, therefore resulting in a patent requiring very narrowly termed claims that necessarily point to "highly collimated" as referring to the laser beam shape, not the rich set of lines as plaintiff contends. Exhibit 20 from defendant PSC's presentation on the '852 patent lists 7 rejections based on prior art under 35 U.S.C. s.s. 102, 103, and 112. *See* Def.'s '852 Markman Presentation, Slide 20; Vinti Decl. Ex. D. PSC argues that plaintiff in these amendments sought to differentiate its invention from previous inventions, and in so doing, cannot claim that which it disclaimed. Defendant's argument that Metrologic should be estopped from disputing the accuracy of that definition, citing to Jonsson v. Stanley Works, 903 F.2d 812, 818 (Fed.Cir.1990) is persuasive. In that case, the patent holder had argued in the patent prosecution that "diffuse light" refers to light emanating from multiple emitters. Although the patent holder argued that "diffuse" did not require production from multiple sources, the Federal Circuit determined that the district court did not err in its determination that he was estopped from asserting that his patent was not limited to multiple emitters. This case presents a similar situation. For example, one amendment after final rejection dated September 10, 1990, provides that plaintiff attempted to differentiate itself from prior art scanners by stating that previous "slot or counter type scanners produce a scanning pattern which is not collimated, but rather which spreads out or diverges widely." Pl.'s '852 Markman Br. at Ex. C, at 1, 9. Thus, in plaintiff's own words, "collimated" should be construed as the opposite of "diverging widely" or "spread out widely." In other words, as consistently used by plaintiff in the prosecution history, "collimated" is understood to mean that little divergence occurs. In addition, although plaintiff had used the term "substantially collimated scanning pattern," the PTO rejected this application based on prior art, thus causing plaintiff to amend the claim to read "highly collimated," rather than "substantially collimated." Thus, as defendant successfully argues, plaintiff is estopped from asserting that the claim language "highly collimated" refers to anything other than "roughly columnar," opposite from widely divergent.

Plaintiff argues that the file history of the '232 patent, a parent application to the '852 patent, mentioned above, favors its claim construction. On May 20, 1992, the Patent Examiner rejected claims in the '232 patent application on the basis of a Japanese patent to Watanuki. *See* Office Action in Application No. 07/580738, 5/20/92, Pl.'s '852 Markman Br. Ex. B. Plaintiff states that the Examiner had concluded that Watanuki disclosed a laser scanner producing a laser light having a "generally narrow volume." Id. at 5. Plaintiff claims it overcame this rejection by distinguishing Watanuki on the basis that it did not disclose a rich set of scan lines for omnidirectional scanning, and that it was thus allowed to amend its claims by adding limitations requiring a "highly collimated projected scanning pattern within which a bar code symbol can be scanned independent of the orientation of said bar code symbol in said highly collimated scanning pattern." Id. at 4.

As the amendment and plaintiff's remarks in the prosecution history shows, it is true that plaintiff distinguished its patent from Watanuki's scanners because it did not disclose a rich set of scan lines:

As stated during the interview the subject invention constitutes a scanner which produces a rich scanning pattern of plural groups of parallel scan lines which intersect each other in a highly collimated or confined volume. That highly collimated scan pattern is projected from the scanner's window out a substantial distance, e .g., at least six inches, for reading a bar code which is merely presented to it (e.g., brought into, but not necessarily moved through, the pattern). This is to contrasted with the prior art slot or counter type scanners, like the scanner of the Watanuki reference, which require that the bar code be carried, moved, or passed through the scanning pattern ..., typically in one direction, to ensure that the bar code is read. One reason such motion is required is that the scanning pattern is not rich with lines.

Amendment after Final Rejection, Pl.'s Markman Br. Ex. C, at 9.

However, plaintiff explained further in the Amendment that it attempts to add the term "highly collimated" to distinguish prior art scanners which diverged widely:

Moreover, *slot or counter type scanners produce a scanning pattern which is not collimated, but rather which spreads out or diverges widely*. Thus, in order to ensure that the bar code is swept by the outgoing laser beam the bar code must be moved substantially through the scanning pattern to be transversed by the laser beam.

Moreover, the *widely divergent scanning patterns* produced by slot or counter type scanners renders such scanners unsuitable for various scanning applications, e.g., small or mid-size drug, convenience, or other retail stores, wherein various bar coded items are commonly located on the counter at the check-out site for point of sale purposes. Thus, in such applications a typical counter or slot scanner, with its *widely diverging scanning pattern,* could inadvertently scan a bar code item displayed on the counter adjacent the scanner.

Id. at 9. Thus, in plaintiff's own words, the term "highly collimated" refers to the fact that the scanning pattern does not diverge widely or spread out, as is the case with prior art scanners and the Watanuki scanner. Plaintiff's own remarks in explaining its invention demonstrate that the addition of a rich set of scan lines was not intended to define the term "highly collimated" in the claimed invention. Rather, Metrologic's amendment of its claim to add a rich scanning pattern of plural groups of parallel scan lines is only an additional way in which the claimed invention purportedly differed from the prior art.

Defendant asserts that a claim cannot be construed any broader than its unambiguous scope, citing Amhil Enterprises, Ltd. v. Wawa, Inc., 81 F.3d 1554, 1562 (Fed.Cir.1996). In that case, the patentee submitted responses in the prosecution history using "substantially vertical" and "vertical" interchangeably. The Federal Circuit determined that this prosecution history provided a further indication that the patentee thought of his substantially vertically faces as essentially vertical, especially if they were created to avoid prior art that outwardly extended projections with variously sloped faces. Similarly, in this case, where the patentee contrasted the claimed invention with the prior art, which was "divergent" or "wide," the unambiguous implication is that the "highly collimated" term refers to the columnar projection of the scan lines within the scanning pattern, not to the richness of the scan lines within the scanning pattern. Under *Amhil,* this indicates plaintiff's understanding of the term "highly collimated," as conveyed in its patent prosecution history, as the opposite of "widely divergent" or "spread out."

After consideration of the claim language, the specification language, and the prosecution history, this Court construes the claim language "highly collimated projected scanning pattern" as *a scanning pattern of scan lines that is columnar in nature, or as columnar as possible, given practicable design constraints*. The Court does not construe "highly collimated" as referring to the richness of the scan pattern into which bar coded items can be presented for reading irrespective of orientation. Rather, "highly collimated" refers to the columnar nature of the laser light projection containing the scan pattern.

3. "Narrowly confined scanning volume"

PSC argues that the term "narrowly confined scanning volume" refers to a scanning volume that is narrowly confined in the sense that the shape of the scanning volume diverges at a relatively small rate as it is projected from the scanner. *See* Def.'s Br. at 23. PSC argues that "narrowly confined scanning volume" is defined as follows:

[T]he volume in which a bar code symbol can be scanned must be narrow. A scanner with a narrowly confined scanning volume is suitable for presentation scanning and is not designed for sweep scanning. Also the angle of divergence of each group of scan lines must not exceed the 12 (deg.) rate of divergence in the example. Furthermore, the term is not so broad as to cover all scanning volumes that are generally confined.

See Def.'s Markman Presentation, Slide 50. Defendant PSC thus contends that the claim must be construed such that the angle between the emitted parallel lines must diverge no more than 12 degrees. *See* '852 Patent Fig. 1, Def.'s Markman Presentation, Slides 47, 50.

Plaintiff Metrologic argues that "narrowly confined volume" refers to

[A]n area in which the bar codes can be successfully read that is generally confined within a narrow, yet diverging volume, e.g., a pyramid, cone, frustum, etc., which is centered about a projection axis which is substantially but not precisely perpendicular to the plane of the window. Further, a "narrowly confined volume" must be sufficiently confined so that the operator can obtain a successful read of a bar code in the area in front of and slightly diverging from the front of the scanner (up to 6 inches), but not outside the area, thereby preventing unintended reads.

Pl.'s Markman Br. at 17.

This Court considers the claim language, the specification, and the prosecution history, and it finds that plaintiff's construction is correct. The claim language referring to the "narrowly confined scanning volume" provides:

(h) control means within said compact housing for controlling the operation of said counter-top projection laser scanner so that, during scanner operation, the laser beam produced from said laser beam producing means passes along a portion of said central reference plane, to the first, second and third rotating light reflective surfaces of said laser beam sweeping means, and as the laser beam sequentially reflects off said first, second and third rotating light reflective surfaces, the laser beam is repeatedly swept across said first, second, third, and fourth and fifth stationary light reflective surfaces thereby producing first, second, third, and fourth and fifth groups of plural scan lines, respectively, which are projected out through said light transmission window and intersect about a projection axis within a narrowly confined scanning volume

extending from adjacent said light transmission window to at least about six inches therefrom so as to produce a highly collimated scanning pattern within said narrowly confined scanning volume,....

'852 Patent, col. 12, 11. 26-45. Plaintiff contends that language in Limitation 15 sets forth additional definition. That section states: "the code symbol is scanned omnidirectionally by said highly collimated scanning pattern while preventing unintentional scanning of code symbols on objects located outside of said narrowly confined scanning volume." '852 Patent, col. 12, 11. 53-57. Although plaintiff maintains that the "narrowly confined scanning volume" refers to preventing the "unintentional scanning of code symbols on objects" located outside the volume, the position of terms in the claim language indicates that the scanning volume refers to the area in which items are scanned, while "narrowly confined" refers to the characteristic of that area.

The specification throughout refers to the volume as "relatively narrow, yet diverging." Id. col. 3, 11. 15-20. The specification, in the summary of the invention and the detailed description of the preferred embodiment, indicates that the patent is designed to be projected downward or outward from the face of the scanner, as it gives examples of the following volumes: pyramid, cone, and frustum. *See* id. & col. 5, 11. 34-40. Specifically, with respect to the volume, the claim specification states:

The scanning pattern is generally confined within a *relatively narrow, yet diverging volume,* e.g., pyramid, cone, frustum, etc., centered about a projection axis which is substantially but not precisely perpendicular to the plane of the window.

'852 Patent, col. 3, 11. 15-20. From this language, it can be inferred that the scanning volume of this patent, much like the scanning pattern discussed above, is not wide, but rather, narrow.

Defendant states that, while there is little guidance, if any, to be found in the specification and prosecution history, the specification contains a few uses of the term "narrow," which it compiles at Palmer Declaration para. 44:

A bar code scanner for stationary disposition at a counter to [sic] projecting a scanning pattern comprising first, second, third, fourth and fifth group of parallel scan line within a *relatively narrow, yet diverging, volume* ...

'852 Patent, at Abstract (emphasis added).

For example, in some check-out counter applications it is desirable to create a scanning pattern which, although aggressive, is confined within a *relatively narrow volume,* to prevent unintentional scanning of nearby objects.

Id. col. 2, 11. 7-11 (emphasis added).

The scanning pattern is generally confined within a *relatively narrow, yet diverging, volume,* e.g., pyramid, cone, frustum, etc., centered about a projection axis which is substantially but not precisely perpendicular to the plane of the window.

Id. col. 3, 11. 16-20 (emphasis added).

Moreover, by virtue of the fact that the volume or space in which [the] scanning pattern is projected *is somewhat narrow or confined,* the amount of counter space which must be kept clear of other bar coded items to enable the proper scanning of the selected bar coded items, can be kept to a minimum. This should be contrasted with the use of conventional "slot-type" scanners, if mounted on a counter to project the scanning pattern thereabove. In such an arrangement the slot scanner produces such a wide or divergent pattern that a large amount of counter space must be reserved for scanning, and thus cannot be used for any other purpose, e.g., cannot be used to display any item bearing a bar code, etc.

Id. col. 4, 11. 55-68 (emphasis added).

The scanning pattern 26 is projected into a confined space or volume 38 (see FIG. 1), which as mentioned earlier is a *relatively narrow, yet diverging and is centered about a projection axis 38*. The *diverging volume 36* containing the pattern *may be of any shape, e.g., pyramidal, conical, irregular, etc.,* depending upon the length [of] the various lines of the pattern (i.e. the "envelope" defined by the end points of each line of the pattern) and may be established by the size of the scanner's mirrors and/or the size and shape of the window.

Id. col. 5, 11. 31-40 (emphasis added). This specification language repeatedly refers to the volume as being "relatively narrow, yet diverging," with narrow being interchangeable with "confined." In addition, the volume may take a "pyramidal, conical, irregular" shape. This reinforces the construction of the term "narrowly confined volume" as narrow, and taking the shape of a cylinder that slightly diverges.

Plaintiff notes, however, that nothing in Limitation 13 or 15 requires that a "highly collimated" pattern be present throughout the entire narrowly confined scan volume, and that as long as a portion of the narrowly confined volume is highly collimated for purposes of omnidirectional scanning, these limitations are satisfied. Operating under its construction that the term "highly collimated" refers to the rich nature of the scan lines, plaintiff argues that the claim language simply does not require that the scan pattern be omnidirectionally read throughout the entire volume. Given the Court's construction of "highly collimated projected scanning pattern" above, there is no need to determine whether the "narrowly confined scanning volume" must contain a scan pattern that can be read omnidirectionally everywhere in the pattern.

Defendant argues in particular that "narrowly confined scanning volume" must be construed to require a volume in which the angle of divergence between the scan lines is 12 (deg.) or less. PSC notes that the mirror mounting angles of the rotating assembly of mirrors (the polygon) are 2 (deg.), 4 (deg.), 6 (deg.), and 8 (deg.). '852 Patent, col. 8, 11. 14-15. Specifically, the specification provides:

[T]he reflective faces 46 of the polygon are each disposed at a slight angle (e.g., 2, 4, 6, and 8 degrees) to the rotational axis 44 each reflective face of the polygon sweeps the laser beam 48 across a different portion of the folding mirrors 82-90, thereby producing the parallel lines 40 (i.e., the "raster") of the various groups.

'852 Patent, col. 8, 11. 13-19. Defendant submits that these angles determine how quickly the scan lines within each of the five groups in the scan pattern diverge from one another as the distance from the scanner increases, resulting in an angle of divergence no greater than 12 (deg.) for each group of scan lines. Specifically, the 12 (deg.) angle of divergence is arrived at by multiplying by two the difference between the largest (8 (deg.)) and smallest (2 (deg.)) angles, which is 12 (deg.) in this case.

The language in the specification that "the lines making up the scanning pattern are preestablished in configuration and orientation with respect to one another ...." supports defendant's contention that the angles

of divergence are fixed. The specification, however, refers to these angles of the polygon in terms of approximation, as "e.g., 2, 4, 6 and 8 degrees," '852 Patent, col. 8, 11. 14-15, and "approximately 2, 4, 6, and 8 degrees," id. at col. 7, 1.67-col. 8, 11. 1-2. All degrees referred to are given in approximation, and are referenced in the specification, not the claim language itself. While the specification suggests this angle of divergence, there is nothing in the claim itself that requires it. To define the angle of divergence to be no greater than 12 (deg.) is to unnecessarily limit the claim.

Furthermore, given the estimated angles from the vertical axis, they may define the angle of divergence between the scan lines *themselves,* yet they do not substantially describe the "narrowly confined scanning volume" which contains the lines. Taking defendant's theory to its logical extreme, the exact dimensions of the resulting volume could be calculated, using the estimated angles and the estimated length of 6 inches from the light source. The claim language, however, does not require such a calculation, and a construction providing for more than is claimed would be in error.

Based on the language of the claim, the specification, and the prosecution history, this Court construes the term "narrowly confined scanning volume" to be *a volume that is narrow, yet diverging, from the transmission window of the scanner, which may take a pyramidal, conical, irregular, or similar shape*. There is no construction requiring that the scan lines in any given group diverge at 12 (deg.) or less.

D. '*342 and* '027 Patents

Patents '342 and '027, or the Multi-port patents, refer to a device that can receive and decode electrical input signals from multiple scanners operating at different speeds, whereby these electrical input signals are the digital representations of symbols such as bar codes. Plaintiff asserts that these patents represent an advantage over prior art in the scanning industry because the decoding device that can connect both a high speed scanner and a slower speed device such as a hand held device allows a cashier the flexibility of using a hand held scanner for oversized and bulky items that may be difficult to place on the high speed scanner built within the counter.

Characters in any given symbology are defined by a certain pattern of bar and space widths. In the Universal Product Code ("UPC"), for example, each character is represented by varying widths of two spaces and two bars that add up to seven units of width called modules. To read a bar code, a beam of light (the scanner) sweeps over the bar code and reads the transition and count data corresponding to bar and space widths. While a decoder typically handles only one or two symbologies, plaintiff's patent allegedly claims a single device that can process the inputs of various types of bar code scanning devices.

Plaintiff asserts claims 8 and 10 of the '342 Patent against defendant's alleged infringing devices. Because claim 8 depends from claim 5 of the '342 patent, claim 8 includes all of the limitations of claim 5 as well as the additional limitation of claim 8 (that is, limitation 9). The limitations to be construed with respect to the '342 patent are limitations 6, 7 and 8 of claim 5, and limitation 9 of claim 8.FN14 The language of these limitations is as follows:

FN14. Claim 10 depends from claim 8, so it necessarily includes all the limitations of claim 8.

Limitation 6: *means for generating a plurality of predetermined frequencies* and
Limitation 7: *means for measuring the time duration of each of said first and second levels of said digital*

input signals using one of said plurality of frequencies and producing digital data representing said measured time durations for use by

Limitation 8: *decoder means for decoding said code symbol*

Limitation 9: *said device comprises a second decoder for receiving said processed signals, said second decoder being programmable for decoding a second type of bar code or other digital code*

In addition, limitations 5 and 7 of claims 1 and 6 of the '027 patent are at issue and will be discussed herein. Claim 6 depends from claim 1 so it contains all the limitations of claim 1 along with the additional limitation of claim 6. The disputed limitations are as follows:

Limitation 5: *common timing means* for measuring the time duration of the first and second signal levels between detected signal level transitions in the supplied digital data signal, and producing digital data related to the time duration of the first and second signal levels in the supplied digital data signal.

Limitation 7: *common data processing means* operably associated with said common timing means and programmed for processing said digital data from the supplied digital data signal, so as to produce decoded symbol data representative of the bar code symbol being *scanned by said scanning device producing the supplied digital signal; and*

'027 Patent, col. 21, 11. 9-25.FN15

FN15. Additionally, the limitations in dispute extend to claim 28 of the '027 patent. However, as plaintiff concedes, these limitations of claim 28 (that is, limitations 1, 2, 5, and 6) are identical to the limitations found in claim 1 of the '027 patent, Pl.'s '342/'027 Markman Br. at 39, and the Court's construction of the limitations of claim 1 will also apply to the limitations 1, 2, 5, and 6 of claim 28. Furthermore, limitations 3 and 4 of claim 28 are very similar to limitations 6 and 7 of claim 5 of the '342 patent. Id. Accordingly, the claim construction of limitations 6 and 7 of claim 5 of the '342 patent will apply to the limitations 3 and 4 of claim 28.

As an initial matter, plaintiff claims that the preamble to Claim 8 must be construed along with the limitations because "it is the preamble that defines the particular kind of device being claimed." Pl.'s '342/'027 Markman Br. at 19. The preamble to Claim 8, consisting of limitations 1 through 5, reads:

Limitation 1: A device for processing plural digital input signals,

Limitation 2: each said digital input signal having first and second levels,

Limitation 3: and being provided to said device by at least one input means,

Limitation 4: and each said digital input signal representing a code symbol recorded on a medium read by said input means

Limitation 5: the frequency of each said digital input signal from said input means being a function of the type of said input means and the resolution of said code symbol as recorded on said medium, said device

comprising

'342 Patent. Plaintiff cites to Rohm & Haas Co. v. Biotech Corp., 127 F.3d 1089, 1091 n. 1 (Fed.Cir.1997), which states that a court must review the overall form of the claims and the invention as defined by the specification and file history, in order to determine whether the preamble is an affirmative limitation. The specification should be consulted to determine whether the preamble recites the specific problem with the prior art which has been overcome by the invention. Applied Materials, Inc. v. Advanced Semiconductor Materials America, Inc., 98 F.3d 1563, 1572-73 (Fed.Cir.1996). Where a patentee refers to a preamble term as a limitation during prosecution to distinguish prior art, it should be treated as an affirmative limitation. Strattec Sec. Corp. v. Gen. Auto. Specialty Co., 126 F.3d 1411, 1418 (Fed.Cir.1997). If the claim preamble is necessary to explain, give "life, meaning and vitality" to, or to particularly point out the invention defined by the claim limitations, then it should be construed together with the balance of the claim as a positive limitation. Rohm & Haas, 127 F.3d at 1091 n. 1.

Plaintiff relies on a previous Opinion in an earlier case brought by Metrologic charging Symbol Technologies with infringement of its '342 patent, *see* Pl.'s '342/'027 Markman Br.App. Ex. 3, in which this Court denied defendant's motion for summary judgment of infringement. *See* Opinion, 9/30/93, Pl.'s '342/'027 Markman Br.App. Ex. 3. In the Opinion, this Court discussed the preamble of the '342 patent to the extent that defendant, interpreted the preamble to mean "a bar code decoder which adapts to different input frequencies," id. at 9, with which plaintiff disagreed.

Defendant claims that plaintiff's reference to the preamble as limitations, to the extent it relies on this Court's Opinion in earlier litigation between Metrologic and Symbol, is exaggerated. Defendant argues that the Court did not actually decide that the five elements of the preamble were limitations, but only noted the dispute between the parties on that issue and proceeded. As defendant correctly notes, the Court did not decide that the preamble indeed consisted of affirmative limitations, but merely discussed the preamble within the context of the parties' disagreement. Specifically, the Court determined that a colorable dispute existed as to whether the preamble language actually addressed the innovation of solving the rat's nest problem or whether the solving of the "rat's nest" problem in the prior art was not in fact embodied in the claim. *See* 9/30/93 Opinion, Pl.'s '342/'027 Markman Br.App. Ex. 3, at 15. The Court noted that while claim interpretation is ordinarily a question of law, a serious factual dispute existed as to claim interpretation. Accordingly, the Court denied defendant's motion for summary judgment. There being no conclusion regarding the preamble as consisting of affirmative limitations, in a case not involving defendant PSC, this Court's previous Opinion in 1993 does not provide conclusive support for plaintiff's position.

Although defendant further contends that the Federal Circuit has since clarified the law as to when the preamble should be treated as a claim limitation in Catalina Marketing Int'l, Inc. v. Coolsavings.com, Inc., 289 F.3d 801, 808-09 (Fed.Cir.2002), *Catalina* provides no further clarification regarding whether a preamble should be treated as a limitation.FN16 The Federal Circuit in *Catalina* reiterates that a preamble limits the invention if it recites essential structure or steps, or if it is "necessary to give life, meaning, and vitality" to the claim. *See Catalina,* at 808 (citing Pitney Bowes, Inc. v. Hewlett-Packard Co., 182 F.3d 1298, 1309 (Fed.Cir.1999)). Nevertheless, review of the entire patent demonstrates that although plaintiff claims that the preamble gives "life, meaning and vitality" to the claim, and "defines the particular kind of device being claimed," Pl.'s '342/'027 Markman Br. at 19, the preamble gives meaning and description to the digital input signals that are processed by the invention, not the device itself. As can be seen by the language of the preamble, reference to the device is only in the first phrase:

FN16. In *Catalina,* the Federal Circuit stated that whether a preamble will be treated as a limitation is "resolved only on review of the entire [ ] ... patent to gain an understanding of what the inventors actually invented and intended to encompass in the claim." *Id*. at 808 (quoting Corning Glass Works v. Sumitomo Elec. U.S.A., Inc., 868 F.2d 1251. 1257 (Fed.Cir.1989). Factors that will favor finding a preamble to be a limitation include whether the inventor has indicated reliance on the preamble and claim body to define the claimed invention, whether recitation of additional steps or structures are underscored as important by the specification, and clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art. *See* Catalina, 289 F.3d at 808 (citations omitted). Without such reliance, however, a preamble is not deemed a limitation when the claim body describes a structurally complete invention such that the preamble's deletion does not affect the structure or steps of the invention. *See* id. at 809.

A *device for processing plural digital input signals,* each said digital input signal having first and second levels, and being provided to said device by at least one input means, and each said digital input signal representing a code symbol recorded on a medium read by said input means the frequency of each said digital input signal from said input means being a function of the type of said input means and the resolution of said code symbol as recorded on said medium....
'342 Patent, col. 21, 11. 26-34 (emphasis added). A review of the language of the claim reveals that the preamble does not relate directly to the invented device per se, but, rather, to the digital input signals that are processed by the device. According to the preamble, these digital input signals have first and second levels, are provided to the device by at least one input means, and represent a code symbol, with its frequency being a function of the input signal and resolution of the code symbol. While these descriptions of the signals are indicative of the information that is inputted into the device, they do not provide "an understanding of what the inventors actually invented and intended to encompass by the claim." Catalina, 289 F.3d at 808 (quoting Corning Glass Works, 868 F.2d at 1257). There is no reference to any specific problem with the prior art which has been overcome by the invention, aside from processing plural digital input signals. Here, the preamble does not add substantially to the understanding of the device itself, but rather to the understanding of input signals received by such a device. Plaintiff raises no indication of the inventor's intent to use the preamble to define the claim invention. In addition, because the preamble describes the input signals, it is not essential to understand the disputed limitations or terms in the claim body regarding the invention.
Moreover, contrary to plaintiff's assertion, the preamble was not relied upon substantially during the prosecution of the claim. It is clear that the preamble phrase was not relied upon to distinguish the patent over the O'Neil patent, despite plaintiff's argument that the addition of the word "plural" to "digital input signals" in the preamble was for purposes of distinguishing this prior art. As plaintiff asserts, the Examiner stated in the Summary Record of October 10, 1991 that the amended claims appeared to overcome its previous rejection. *See* Pl.'s s. 287 Br. Ex. 15. The Examiner bases this statement, however, on the difference between the patents' clock frequency selections, not the fact that plaintiff amended its patent to add the word "plural." The Examiner stated, "Claims appear to distinguish over O'Neil who discloses clock freq. selection to expected range of frequencies to sample center of narrowest bar or space. Applicant selects freq. appropriate for scanner type, stops and starts clock at each pulse transition, and counts clock signals to determine code bar or space." *Id*. The PTO Examiner's comments, to which this amendment responded, indicated no clarification with respect to the number of input digital signals in the prior art necessitating the addition of the word "plural." Rather, the distinction from the prior art related to how clock frequency is selected, not discussed anywhere in the preamble. Thus, it cannot be concluded from the prosecution history that there was clear reliance on the preamble to distinguish the invention from the prior art.

Accordingly, upon review of the claim, specifications, and prosecution history, the preamble does not define the particular device being claimed. Rather, the preamble describes the input digital signals which the device receives. Accordingly, the preamble phrase consisting of limitations 1 through 5 above is not an affirmative limitation of claim 5, and the preamble therefore need not be construed here.

1. "*Means for generating a plurality of predetermined frequencies*"

Plaintiff asserts that the function of this means-plus-function element is that two or more frequencies are generated to be available for counting purposes. *See* Pl.'s '342/'027 Markman Br. at 23. Plaintiff contends that it is the generation of plural frequencies that enables a device equipped with the Multi-Port Patents to handle scanner inputs of more than one type. Plaintiff argues that the structures that perform the function of generating two or more frequencies correspond to the Clock Input 12, a Crystal Oscillator 13 or other External Clock 15, and the Clock Divider Circuitry 14. *Id*.

Defendant PSC asserts that the function of this means-plus-function element is "generating a plurality of predetermined frequencies." Def.'s s. 287 Br. at 24. The parties appear not to dispute that the function is to generate a plurality of frequencies. PSC, however, contends that the term "predetermined" requires a frequency that is "fix[ed] conclusively or authoritatively beforehand," and furthermore, that this frequency is generated by a crystal oscillator. Thus, it argues that the corresponding structure is the crystal oscillator 13, the clock input 12, and the clock divider circuitry 14. In other words, PSC contends that the structure must contain a crystal oscillator 13, and cannot contain an external clock 15 in the alternative.

For the following reasons, the Court finds plaintiff's construction to be correct.

As a means-plus-function element, the Court must first identify the claimed function of this limitation using traditional means of claim construction, and then determine the structure corresponding to the identified function. *See* Omega Eng'g, Inc. v. Raytek Corp., 334 F.3d 1314, 1330 (Fed.Cir.2003) (citing Micro. Chem., Inc. v. Great Plains Chem. Co., Inc., 194 F.3d 1250, 1258 (Fed.Cir.1999)). In this case, plaintiff and defendant agree that the function of the means-plus-function element is "generating a plurality of frequencies." The source of dispute between the parties, rather, is the structure corresponding to this function.

The language of the specification provides insight with respect to the limitation "means for generating a plurality of predetermined frequencies," as well as what is meant by "predetermined." As plaintiff points out, the function of clock input 12 is "to produce the pulse train" for purposes of measuring the width of bars and spaces. Plaintiff's contention that the frequency source for the clock input 12 is not limited to a crystal oscillator but can include any other "external clock 15" is supported by the specification, which describes the following:

The clock input 12 is provided from an external fixed frequency source 13, e.g., *a 40 MHz crystal, or another external clock 15* to produce the pulse train. The output of the clock input circuit 15 is provided to the clock divider circuitry 14. That circuit includes dividers for successively dividing the frequency of the clock pulses by a factor of two to produce a plurality of clock frequencies, as will be described in detail later. The plurality of clock signals is provided to a multiplexer, clock mux 16.

'342 Patent, col. 4, 11. 43-53. According to the specification, the clock pulse train is produced from clock input 12, which in turn is from either external frequency source 13, which may be a 40 MHz crystal, or

another external clock 15, the frequencies of which are divided by a factor of two in the clock divider circuitry 14, which thereby creates a plurality of clock frequencies.

Defendant argues that the usage of examples of predetermined frequencies in the specification, such as 40 MHz, 625 KHz, and 9.75 KHz, which are specified to three significant digits, are indicative of a relatively high degree of accuracy that requires the use of a crystal-based clock, which is a highly stable and accurate source. Def.'s Br. in Opp. to Pl.'s Summ. J. Mot. at 19. As demonstrated above, the patent does not require the use of solely the crystal oscillator. Even if defendant's contention that a crystal-based clock is stable and accurate is ultimately true, this does not refute the specification language specifically allowing for an external clock other than a crystal oscillator. There is, in addition, no relevant prosecution history that states otherwise.FN17

FN17. Furthermore, plaintiff argues that, contrary to defendant's assertion, decoding involves only the relative width of bars and spaces, and thus all that decoding requires is that the frequency be stable over the milliseconds it takes to scan a bar code, and therefore, a precise known frequency is simply not necessary. In support of its argument that the type of precision suggested by defendant is meaningless to the ability of the device to function as claimed because decoding involves determining the relative width of bars and spaces, plaintiff cites to its expert Roger Palmer's deposition:
Q: When you answered my previous question that it wouldn't have made a difference for scanning a particular bar code at a particular time whether you used a crystal oscillator or a ring oscillator, why would there be no difference?

A: Because the decoding process is looking at relative counts between bars and spaces. If the counts were differing in all respects, by 10 or 20 percent in one case versus another, that would not have made a major difference in decodability.

Roger Palmer Depo. Tr., Pl.'s App. Ex. 21, at 109:6-17. While this evidence appears to support the contention that either oscillator adequately satisfies the purpose of producing the pulse train, the Court need not consider such external evidence, where the claim is construed from the intrinsic evidence, absent an ambiguity.
Defendant contends that the "predetermined" frequencies requires that they be fixed conclusively or authoritatively before division, and results from the fact that the frequencies are derived from the output of a crystal oscillator with a 40 MHz output. PSC cites to Webster's Third New International Dictionary, which defines "predetermine" as "to determine beforehand," and which defines "determine" as "to fix conclusively or authoritatively." Palmer Decl. para.para. 92-94. However, as submitted by plaintiff, the definition of "predetermine" includes "to impose a direction or tendency beforehand," Webster's Collegiate Dictionary, at 917 (10th ed.), Pl.'s Reply Br. Ex. A, and "to fix the form, position, or character of beforehand." Id. at 317. Even if plaintiff's proposed construction of the term could be interpreted as contrary to the ordinary meaning of the term, and plaintiff could be considered its own lexicographer, plaintiff's own definition of the term is given in the specification. The specification states: "That circuit includes dividers for successively dividing the frequency of the clock pulses by a factor of two *to produce a plurality of clock frequencies*." '342 Patent, col. 4, 11. 47-50 (emphasis added). Thus, according to the specification, the "predetermined" aspect of the frequencies refers not to a precise starting frequency determined beforehand, but to the known set of divisions that are applied through the clock divider circuitry 14 each time the device

is operated, which creates the plurality of frequencies.

The prosecution history lends little information with respect to this limitation. Although defendant argues that plaintiff changed the language from "internal frequencies" to "predetermined frequencies," neither the amendment nor the USPTO office action to which the amendment responded contains any discussion regarding this terminology.FN18 *See* USPTO Office Action, Aug. 14, 1991, & Amendment after Final Rejection, Oct. 14, 1991, Pl.'s Summ. J. Br.App. Ex. 18, 22.

FN18. Furthermore, the understanding of the patent holder as demonstrated in the remarks indicates that O'Neill's patent, from which plaintiff sought to distinguish its claim, likely disclosed a "predetermined" frequency that is fixed authoritatively beforehand:
As discussed with the Examiner the O'Neill et al patent neither discloses or suggests the subject matter sought to be patented herein.... [T]he O'Neill patent takes the input frequency provided by the system clock 130 to produce four predetermined frequencies.

...

O'Neill et al does not disclose that the system include plural predetermined frequencies built into the system for use when the system is fed by different types of scanners to effect the reading of the codes scanned by each type of scanner.

Amendment after Final Rejection, Oct. 14, 1991, Pl.'s Summ. J. Br.App. Ex. 18, at 6-7.
Considering the claim language, the specification, and the prosecution history, *the function of the means is to generate a plurality of predetermined frequencies, predetermined meaning that the division of the clock pulse frequency by two is a constant, fixed process which allows the frequency to always constitute half of its original number*. "Predetermined" does not mean that the frequencies must be determined in advance, or that the frequency must be fixed conclusively or authoritatively beforehand. In addition, *the structure corresponding to the function is the Clock Input 12, which is either the Crystal Oscillator 13 or other External Clock 15, and the Clock Circuitry Divider 14*. That is, the clock input 12 consists of a 40 MHz crystal oscillator or an equivalent external clock.

2. "*Means for measuring the time duration of each of said first and second levels of said digital input signals using one of said plurality of frequencies and producing digital data representing said measured time durations for use by*"

As for limitation 7, plaintiff argues that the function of this means-plus-function element is to select from the available predetermined frequencies the frequency appropriate for the scanner type and then measure the time durations using that frequency. *See* Pl.'s '342/'027 Markman Br. at 26. Plaintiff claims that the corresponding structure is the clock mux 16, which is driven by control signals from the programmable processor 26, and that the structures corresponding to the function of counting based on the selected frequency are the transition detector 24, the sequencer 28 and the digital counting means 30. *See* '342 Patent, FIG. 1 (attached hereto as Appendix I).

Defendant PSC contends that this element contains two functions: (1) measuring the time duration of each of said first and second levels of said digital input signals using one of said plurality of frequencies; and (2) producing digital data representing said measured time durations for use by decoder means for decoding said code symbol. *See* Def.'s s. 287 Br. at 25 (citing Palmer Decl. para. 47). Defendant asserts that the corresponding structure that implements these two functions is the transition detector 24, the sequencing means 28, and the digitizer counting means 30. Def.'s s. 287 Br. at 25. PSC argues that the clock mux 16 is not included within the corresponding structure because the function of selecting a frequency is not included. Def.'s Br. in Opp. to Pl.'s '342/'027 Summ. J. Mot. at 33.

The Court first identifies the function of the means-plus-function limitation, then identifies the corresponding structure, and concludes for the following reasons that plaintiff's construction is correct. In construing the function of the limitation, the Court looks at the prosecution history, the claim language, and the specification. In plaintiff's Amendment After Final Rejection of October 14, 1991, which responded to the PTO's Final Rejection dated August 14, 1991, the claim limitation here was changed from the previous language (amended once):

[M]eans for selecting a first one of said plurality of frequencies for use by said device to optimize the processing of said output signals from said input means and for timing the operation of said device

to the present language, as follows:

[M]eans for measuring the time duration of each of said first and second levels of said digital input signals using one of said plurality of frequencies and producing digital data representing said measured time durations for use by decoder means for decoding said code symbol

Amendment After Final Rejection, 10/14/91, Pl.'s Partial Summ. J. Mot.App. Ex. 18, at 2. The PTO examiner explained that, after his October 10, 1991 interview with patent inventors Stein and Knowles, the patentee's proposed amendment appeared to overcome the previous rejection because

[The][c]laims appear to distinguish over O'Neil who discloses clock freq. selection to expected range of frequencies to sample center of narrowest bar or space. Applicant selects freq. appropriate for scanner type, stops and starts clock at each pulse transition, and counts clock signals to determine code bar or space.

Examiner Interview Summary Record, 10/10/91, Pl.'s Br. in Opp. to Def.'s s. 287 Summ. J.App. Ex. 15, at 1. Despite defendant's argument that there is no selecting function within these means because the function of selection is not recited in the language, and therefore the clock mux 16 is not a corresponding structure, the above statement by the PTO examiner indicates that the function of selecting is contained within the patent, notwithstanding the deletion of the phrase "means for selecting a first one of said plurality of frequencies" from the claim language. As this prosecution history implies, "using one of said plurality of frequencies" necessarily refers to the function of selecting one of the plurality of frequencies available. As plaintiff asserts, the concept deleted was not that of selecting, but that of optimizing the processing. *See* Pl.'s Reply Br. at 10. The Examiner's remarks differentiated the claim from the O'Neil patent, which selects clock frequency within an expected range of frequencies and which samples the center of the narrowest bar and space. The '342 patent, on the other hand, in selecting clock frequency, determines the scanner type being used, and then counts the clock signals, which represent the width of the bars and spaces, to determine clock frequency.

The Court notes that the parties submitted additional briefing on this issue of whether the function includes that of selecting a frequency. *See* Shalek Letter, 7/31/03; Mondolino Letter, 8/14/03. Defendant argues that the importance of the comments in the prosecution history, relied upon by plaintiff, is undercut by the Federal Circuit's recent decision in Rambus, Inc. v. Infineon Techs. AG, 318 F.3d 1081 (Fed.Cir.2003), which PSC contends holds that significant weight should not be ascribed to prosecution history comments when the claim language fails to reflect what is stated in those comments. In *Rambus,* the district court had construed "integrated circuit device" to include a device identification register, interface circuitry, and comparison circuitry, where the claim language the terms "comparison circuitry" and "device identification register" appeared nowhere in the claim language. The claim instead referred to "a first internal register to store a value which is representative of a number of clock cycles," and "delay locked loop circuitry." *Id*. at 1089. The Federal Circuit, noting that the construction did not clarify or construe the actual words of the claim, found that the district court erred by placing too much emphasis on a single introductory comment made by the patentee in the patent's prosecution history regarding its submission of four new independent claims, which turned out to be an incorrect statement, and determined that the incorrect statement did not govern the meaning of the claims.

The situation presented here is distinguishable from *Rambus,* in that plaintiff relies on the Examiner's statements regarding plaintiff's proposed amendment overcoming the previous rejections, not its own statements in its submission of an amendment. Moreover, there is no indication that the Examiner's statement is incorrect, or that reliance upon such comments is improper. *Rambus* is therefore inapplicable to this case.

Based on the prosecution history, particularly the amendments made to distinguish the '342 patent from the O'Neil patent, the specification, and the claim language, the Court's construction of the function of this claim limitation is to use a frequency from one of the predetermined frequencies, thereby selecting a frequency, according to the scanner type that is inputted into the structure and to process the output signals from the input means so as to produce digital data representing measured time durations, allowing counting of the clock signals by further means. Thus, the function of the limitation includes selecting the frequency.

The parties' dispute with respect to the corresponding structure for this function revolves around whether the clock mux 16 is included as part of the structure. The parties do agree that the structure consists of transition detector 24, sequencing means 28, and digitizer counting means 30. That is, plaintiff agrees that the structure, aside from the clock mux 16, consists of the transition detector, the sequencer, and the counters. The specification provides for a "transition and sign detector 24," '342 Patent, col. 5, 11.11-12, "sequencing means 28," id. 11. 17-19, and "digitizing counting means 30." Id. 11. 31-32. Thus, the parties agree that these structures, apart from clock mux 16, correspond to the identified function.FN19

FN19. Defendant argues that although claim 13 is not being asserted against PSC, that claim nevertheless bears upon the interpretation of claim 5. Claim 13 provides, "The device of claim 5 additionally comprising processing means for processing data, including said digital data, so as to decode said code symbol." Claim 13 is a "dependent" claim that incorporates all the limitations of its base claim, here claim 5, by reference, with the phrase "additionally comprising" to introduce new elements not included in the base claim.

With respect to the clock mux 16, the specification provides:

The *clock mux 16 selects the desired output frequencies* for the device 10 based upon control signals received from clock control circuitry in the programmable processor 26 and in associated circuitry.... The output of the clock mux 16 comprises two clock signals, namely an S clock signal and an M clock signal. The S clock signal provides the basic timing for the device 10, as well as the input to digital counters (to be described later), while the M clock signal provides the basic timing signals for the fixed program decoder.

'342 Patent, col. 4, 11. 54-60. The specification also gives detail as to the "selection" function of the clock mux 16:

[T]he clock mux 16 is arranged to provide two banks of available frequencies for the device to use, namely an upper and a lower bank. The *selection of frequencies* from the upper bank or the lower bank is determined by a frequency switching means 62.

Id. col. 5, 11. 44-49 (emphasis added). Further, the specification provides:

[T]he clock mux 16 comprises an S clock multiplexer mux 32, an M clock multiplexer 34, a CC3 multiplexer 36 and a CC4 circuit 40. These multiplexers and circuits serve to *select one of a plurality of operating frequencies* for optimum processing of the scanner device input data.

Id. col. 5, 11. 61-66 (emphasis added). The language of the specification provides substantial support that clock mux 16 is part of the structure that selects a frequency according to the scanner type that is attached to the structure and provides input signals to it.

Furthermore, the specification provides substantial support that the clock mux 16 works in conjunction with the sequencing means 28 and counting means 30 to produce digital data representing measured time durations, part of the recited function:

The clock mux 16, the sequencing means 28 and the counting means 30 all supply signals to the interface circuit 33 which enables it to properly pass the digitized count data to the FIFO in the programmable processor 26.

Id. col. 5, 11. 39-43.

Thus, considering the prosecution history, claim language, and specification, *the function of this claim limitation is to use a frequency from one of the predetermined frequencies, thereby selecting a frequency, according to the scanner type that is inputted into the structure and to process the output signals from the input means so as to produce digital data representing measured time durations, allowing counting of the clock signals by further means*. In addition, *the structure corresponding to this function consists of the clock mux 16, the transition detector 24, sequencing means 28, and digitizer counting means 30*.

3. "*Decoder means for decoding said code symbol*" and "*Said device comprises a second decoder for receiving said processed signals, said second decoder being programmable for decoding a second type of bar code or other digital code*"

Plaintiff contends that limitations 8 and 9 must be construed together because both relate to decoding and defendant PSC has made its arguments based upon the combination of these two limitations. Plaintiff argues that the "decoder means" of limitation 8 stands apart from limitation 9. Plaintiff construes "decoder means

for decoding said code symbol" as a means-plus-function limitation requiring that the infringing device perform the function of translating bar and space symbol information into some type of decoded output. Plaintiff contends that since both the fixed decoder 20 and programmable processor 26 perform the function of translating bar and space symbol information into decoded outputs, the "decoder means" must have a structure that is the same or equivalent to the fixed decoder 20 or the programmable processor 26.

As for limitation 9, plaintiff construes "said device comprises a second decoder ... said second decoder being programmable for decoding a second type of bar code" as requiring that a second decoder is contained within the device and that the second decoder must be programmable to decode a second symbology. Pl.'s "342/'027 Markman Br. at 29. Metrologic argues that the decoding function is the same as in the decoder means in limitation 8 except for the additional requirement that the second decoder be programmable. Because limitation 9 is not a means-plus-function element, the claim is not limited to the structure of the preferred embodiment of the '342 patent, and may take the form of either the programmable processor 26 or the fixed program decoder.FN20

FN20. Thus, plaintiff asserts, infringement of claim 8 occurs if the accused device has a fixed and a programmable decoder, or has two programmable decoders.

PSC contends that the "decoder means" in limitation 8 is not a third element of claim 5, but rather, describes the normally intended destination of the signal produced by the second element of claim 5, and that the phrase "producing digital data representing said measured time durations for use by decoder means" specifies the nature of the digital data that is produced by the second element. If the "decoder means" is construed to be an element, defendant argues that the corresponding structure must be the fixed program decoder 20. *See* Def.'s Markman Presentation, Slide 88; Pl.'s '342/'027 Markman Br. at 29.

Defendant construes limitation 9 as requiring a decoder that is programmable, so that the corresponding structure is the programmable processor 26, but which confirms that the only remaining structure that corresponds to the decoder means in limitation 8 is the fixed decoder 20, if the "decoder means" is indeed an additional element of the claim. Defendant further argues that for a device to meet the decoding requirements of limitation 8 or 9, it must decode character data and assemble the characters of a bar code label. Defendant maintains that decoding does not take place until the final step of assembling the decoded characters into a label containing all of the original numbers and characters of the label is completed. Plaintiff contests the construction of limitation 9 because it maintains that it is not in means-plus-function format.

In this case, limitation 8 provides the following language preceding the phrase at issue:

[M]eans for measuring the time duration of each of said first and second levels of said digital input signals using one of said plurality of frequencies and producing digital data representing said measured time duration for use by *decoder means for decoding said code symbol*.

'342 Patent, col. 21:36-22:2. As described above, the preceding phrase constitutes two means-plus-function structures. As defendant argues, the "decoder means" describes the normally intended destination of the signal that is produced in limitation 7, and its argument that this description can be analogized to a description of a computer that produces digital data "for use by a printer" is persuasive. As defendant contends, the way "and" is used in the claim supports the conclusion that the claim contains only two

elements, "means for generating" and "means for measuring," and treating the decoder means as a third element would be "at war with [the claim's] grammar and syntax." Credle v. Bond, 25 F.3d 1566, 1572 (Fed.Cir.1994) (finding absence of comma before "securing" indicates the static relationship between spout and form, not a present participle signifying a distinct method step). As discussed above, the language of claims 6 and 7 provides for "said device comprising means for generating ... and means for measuring...." A limitation corresponding to the claim's previous grammar and syntax would require, at a minimum, a similar introduction by the word "and."

In addition, defendant asserts that the phrase "decoder means for decoding said code symbol" is an inferential claim that is not an additional element of the claimed device, citing R. Faber, Landis on Mechanics of Patent Claim Drafting, at s. 16, p. III-5 (4th ed.1998). That treatise provides, "One of the most important technical 'rules' of form in drafting claims is that it is never proper to introduce a new element of the claim in the middle of the clause describing another element.... This is sometimes called 'inferential claiming." ' *Id*. Defendant also cites In re Hutchinson, 154 F.2d 135, 137-38 (C.C.P.A.1946). In *Hutchinson,* the claim limitation had included the phrase, in part, "adapted to be adhered to a metal backing element, ... a flexible sheet material having one surface coated with an unexposed light-sensitive photographic emulsion for the printing of the template design...." *Id*. at 137. The Court of Custom and Patent Appeals in *Hutchinson* held that the limitation was specific only to a photographic paper coated with adhesive, and that the language referring to a metal plate is "mentioned inferentially" and was not positively included as an element." The same can be said for the "decoder means for decoding said code symbol" in this case. The phrase indicates the further destination of the digital data produced by the "means for measuring the time duration." The term "for use by" which precedes the "decoder means" provides additional support that the phrase is modifying the "digital data" that is produced. Accordingly, it cannot be concluded that the "decoder means" included within claim 5 is itself an element of the claim.

Plaintiff disagrees with this argument because it contends that there is no structure described in the limitation for performing the coding, citing O.I. Corp. v. Tekmar Co., Inc., 115 F.3d 1576, 1580 (Fed.Cir.1997). In *Tekmar,* the parties disagreed as to whether the word "passage" was part of the means-plus-function limitation of the patent claim. The disputed language provided for a "first means for passing the analyte slug through a passage heated to a first temperature higher than ambient, as the analyte slug passes from the sparge vessel to the trap." The Federal Circuit stated that the "[s]tructure supporting the means for passing the analyte slug through the water management device containing the passage is not recited in the claim." *Id*. at 1581. Because the Federal Circuit concluded that it was error to have construed the word "passage" as part of the means-plus-function element of the claim, the similar lack of a structure, contrary to plaintiff's assertion, for the "decoder means" counsels against its inclusion within the means-plus-function element. This Court agrees with defendant that "*decoder means" is not an additional limitation in claim 5, and its claim construction is therefore not at issue*.

Limitation 9, from claim 8, is now discussed. Because limitation 9 is not in means-plus-function language, the claim is not limited to the structure of the '342 patent. The patent claim provides that

The device of claim 5 wherein said device comprises a second decoder for receiving said processed signals, said second decoder being programmable for decoding a second type of bar code or other digital code.

'342 Patent, col. 22, 11. 11-15.FN21 The specification of the patent provides a description of the decoders used in the device:

FN21. Defendant asserts that the words "second decoder" do not somehow operate to add two decoders. In a Preliminary Amendment dated March 28, 1991, claims 24 and 26 were each used to add a different decoder to their common base claim 23. *See* Preliminary Amendment, 3/28/91, Hyun Decl. Ex. L, at 3. In the present patent, the language of claim 6 supports a similar conclusion here. *See* '342 Patent, col. 22, 11. 3-8 ("6. The device of claim 5 wherein said decoder means comprises a first decoder for receiving said processed signals and wherein said device uses a second one of said plurality of predetermined frequencies for timing said first decoder ."). While claim 6 depends from claim 5, and includes the "first" decoder means, claim 8 depends from claim 5 and includes the "second" decoder means. Because claim 8 does not depend from claim 6, the reference to a "second" decoder implies that such a characterization was made to differentiate claim 8 from claim 6.

Two types of decoders are in prevalent use. One such decoder is a fixed program decoder,.... Another type of decoder is the so-called programmable processor decoder. That type of decoder is programmable so that it can be used to decode the UPC and EAN codes, as well as a wide variety of other codes.
As will be appreciated by those skilled in the art, the fixed program decoder operates considerably faster than the programmable processor decoder. On the other hand, the fixed program decoder, being specifically designed for decoding a specific code, is therefore inflexible, whereas the programmable processor decoder can be programmed to decode a wide variety of codes as well as provide other desirable functions, such as frequency selection and error detection.

'342 Patent, col. 2, 11. 24-42. As described in the claim limitation, the "second decoder" refers to the fact that the second decoder must receive processed signals, and be programmable for decoding bar codes or digital codes.
The specification as it relates to the subsequent steps after the processing of signals will be examined here. The description of the invention provides that digital count signals are provided to both the fixed program decoder 20 and the programmable processor 26:

These [digital count] signals are provided by the device to a fixed program decoder 20, such as the heretofore identified integrated circuit chip for UPC decoding and to a programmable processor 26 for decoding any type of code which has been programmed into the processor, including the UPC code, if desired.

'342 Patent, col. 3, 11. 58-64. This description states that one can program a code into the programmable processor, whereas the fixed program decoder is a specific type of decoder that already specifies a code for which it is programmed. The patent language refers throughout the specification to the programmable processor's ability to "be programmed to decode a wide variety of codes." '342 Patent, col. 2, 11. 40-41, as well as the UPC and EAN codes, in particular. Id. 11. 31-32. However, "[t]he fixed program decoder 20 receives the transition information and the digital counts from the device 10, as does the programmable processor 26." Id. col. 4, 11. 22-25.

Although the fixed decoder 20 receives processed signals, there is no indication that the decoder is programmable, as the programmable processor is. Review of the claim language supports the conclusion that the instant limitation refers to a programmable processor, as implication to the fixed program decoder includes reference to the decoder's "fixed" status. For example, claim, 7, not at issue here, refers to a "first decoder [that] includes a program fixed therein for decoding a first type of bar code." Id. col. 22, 11. 8-10. And, as discussed in the description of the invention, the fixed program decoder is specifically designed for

a specific code and is therefore inflexible.

PSC maintains, however, that for a device to meet the decoding requirements of Limitation 8 or 9, the decoder must decode character data *and* assemble the characters of a bar code label. *See* Palmer Rebuttal, at 31. According to PSC, decoding does not take place until the final step is performed of assembling the decoded characters into a label containing all the original numbers and characters of the label. The claim language states that the "second decoder [is] programmable for decoding a second type of bar code or other digital code. " '342 Patent, col. 22, 11. 11-15. There is nothing in the claim language that requires the specific steps of decoding the character data *and* assembling the decoded characters of a bar code label to have occurred for decoding to take place. This Court does not construe the claims to require that both steps of decoding character data and assembling an entire label of decoded characters occur before decoding is complete.

Accordingly, the Court's construction of limitation 9 is that *the decoder must be programmable to decode a wide variety of codes and a symbology, and refers to a programmable processor*. This decoder does not refer to the fixed program decoder, which is inflexible. The use of the word "second" does not require that a first decoder be included within the patent. Although the element is not a means-plus-function element, the corresponding structure is a programmable processor, equivalent to the programmable processor 26.

4. "*Common timing means*"

A dispute with respect to claim construction also exists with respect to limitations 5 and 7 of claims 1 and 6 of the '027 patent. Claim 6 depends from claim 1, and so claim 6 contains all the limitations of claim 1 along with the additional limitation of claim 6.FN22 Limitation 5 provides:

FN22. Although the entirety of the claims of the '027 patent are too lengthy to be included, the pertinent part of the patent claims are included in Appendix D following this Opinion.

Limitation 5: *common timing means* for measuring the time duration of the first and second signal levels between detected signal level transitions in the supplied digital data signal, and producing digital data related to the time duration of the first and second signal levels in the supplied digital data signal.
'027 Patent, col. 21, 11. 9-14.
Plaintiff Metrologic construes the function of the "common timing means" of Limitation 5, above, as measuring the time durations of the digital data signals using the frequency appropriate for the scanner type detected. Plaintiff maintains that "common" as used here refers to the fact that the same set of structures perform the timing regardless of which input scanner is selected. The structures of the '027 patent to which plaintiff identifies as corresponding to the function are the clock input 12 (either from a crystal oscillator 13 or other external clock 15), the clock divider circuitry 14, the clock mux 16, and the counters 50 and 52.

Defendant does not appear to dispute the structures corresponding with the common timing means, as defendant's expert identified the exact same structures in his deposition, *see* Palmer Depo. at 145-46, and defendant made no remarks at the Markman Hearing regarding the construction of the term "common timing means." FN23 Plaintiff contends that, from defendant expert Palmer's report, defendant appears to argue that the "time durations" must be measured with a precise frequency so that the actual time corresponding to the bar and space widths is known.

FN23. Defendant appears to base its opposition to plaintiff's claim construction and partial motion for summary judgment on the "common data processing means" of limitation 7. *See* Def.'s Br. in Opp. to Partial Summ. J. at 6.

In this case, much like the '342 patent, decoding refers to counting clock pulses, and the exact time measurements are therefore irrelevant to decoding, as the specification language illustrates:

The clock input 12 is provided from an external fixed frequency source 13, e.g., a 40 MHz crystal, or another external clock 15 to produce the pulse train. The output of the clock input circuit 12 is provided to the clock divider circuitry 14. That circuit includes dividers for successfully dividing the frequency of the clock pulses by a factor of two to produce a plurality of clock frequencies, as will be described in detail later. This plurality of clock signals is provided to a multiplexer, clock mux 16.

'027 Patent, col. 4, ll. 49-58. While the specification refers to the counters 50 and 52 and their ability "to enable 256 counts of 0-255," id. col. 8, l. 5, there is nothing in the claim language itself which requires that the actual time corresponding to bar and space widths be known.

Given the lack of dispute with respect to "common timing means," the function of limitation 5 will be construed to mean *measuring the time durations of the digital data signals using the frequency appropriate for the scanner type detected*. The *structures corresponding to this identified function are the clock input 12 (either from a crystal oscillator 13 or other external clock 15), the clock divider circuitry 14, the clock mux 16, and the counters 50 and 52*.

5. "*Common data processing means*"

The next limitation in dispute with respect to the '027 patent provides:

Limitation 7: *common data processing means* operably associated with said common timing means and programmed for processing said digital data from the supplied digital data signal, so as to produce decoded symbol data representative of the bar code symbol being scanned by said scanning device producing the supplied digital signal;

'027 Patent, col. 21, ll. 19-25.

Plaintiff construes this limitation as requiring that the device contain a processor that is operably connected both to the common timing means and the data output port and which can be programmed so that it can produce decoded symbol data that is representative of the symbol being scanned. Plaintiff contends that the corresponding structure is the programmable processor 26. Metrologic contends that the fixed decoder 20 is not the corresponding structure because it cannot be programmed, and that the programmable processor 26 is shown as the common structure operably connecting the common timing means to the data outputs.

Defendant PSC contends that the data processing means requires a structure that is equivalent to both the programmable processor 26 and the fixed program decoder 20, and both these structures must be present to satisfy this element.

In this case, the Court first determines the function of this means-plus-function limitation. As indicated by

the claim language itself, the function of the limitation is "processing said digital data from the supplied digital data signal...." '027 Patent, col. 21, ll. 20-22. The function of this means is therefore processing digital data from the supplied digital data signal to produce decoded symbol data. Neither party disputes the function of this limitation. *See* Pl.'s '342/'027 Markman Br. at 36; Def.'s '342/'027 Br. in Opp. to Pl.'s Partial Summ. J. Mot. at 7.

The Court must next determine the structure corresponding to the identified function. The function is to process digital data from the supplied data signal to produce decoded symbol data representative of the bar code symbol being scanned by said scanning device producing the supplied digital signal. Defendant cites to the two data paths for the count data generated by the counting means 30. *See* '027 Patent, FIG. 3 (attached hereto as Appendix J). In one path, as Figure 3 indicates, the count data is decoded in the fixed program decoder 20. In the other path, the count data goes directly to the programmable processor 26. This illustration, and the claim language itself, demonstrates that both the fixed program decoder 20 and the programmable processor 26 are "operably associated with said common timing means" and "programmed for processing said digital data from the supplied digital data signal...." '027 Patent, col. 21, ll. 19-25. As discussed above, the common timing means corresponds to the clock input 12 (either from a crystal oscillator 13 or other external clock 15), the clock divider circuitry 14, the clock mux 16, and the counters 50 and 52, and the illustration in the patent shows that count information is conveyed to both decoders. In addition, the specification states that counters 50 and 52, provide information to both the fixed program decoder 20 and the programmable processor 26:

Thus, the FIFO sequencer 44 controls the transfer of the count information from the counters 50 and 52 *to the processor 26* by providing a FIFO write signal to the FIFO in processor 26.

'027 Patent, col. 7, ll. 58-61; and

Count information used for determining the duration of the symbol between transitions is provided by counter 50 *to the fixed program decoder 20*.

Id. col. 8, ll. 21-23. Both the fixed program decoder 20 and the programmable processor 26 appear, from the specification, to be "operably associated" with the structure corresponding to the function of the "common timing means." That both structures are operably associated with the common timing means supports the construction that the structure corresponding to the means may consist of either the programmable processor 26 or the fixed program decoder 20.

Plaintiff relies upon the inflexibility of the fixed decoder 20, versus the ability of the programmable processor 26 to be programmed:

As will be appreciated by those skilled in the art, the fixed program decoder operates considerably faster than the programmable processor decoder. On the other hand, the *fixed program decoder, being specifically designed for decoding a specific code, is therefore inflexible,* whereas the *programmable processor decoder can be programmed to decode a wide variety of codes* as well as provide other desirable functions, such as frequency selection and error detection.

'027 Patent, col. 2, ll. 40-49 (emphasis added). Although defendant maintains that the fixed decoder 20 is the structure that is programmed in a manner uniquely specified by its part number (NCR Type No. 6-1005415/NCR-8415), plaintiff states that the NCR chip noted in the '027 patent does in fact have a program

permanently stored in its memory but it cannot be programmed.

Plaintiff's reliance on the "programmable" aspect is misplaced, as the claim at issue refers to a "programmed," not "programmable," decoder, and, as defendant asserts, the very name "fixed *program* decoder 20" implies that the device is programmed. That the decoder 20 may be pre-programmed is of no moment. The claim language requires only that the decoder be "programmed for processing said digital data from the supplied digital data signal."

However, despite defendant's point that both decoders are operably associated with the "common timing means," and the fact that both decoders may be "programmed," the Court must determine the structure that corresponds to the identified function of "produc[ing] decoded symbol data representative of the bar code symbol being scanned by said scanning device producing the supplied digital signal." Looking at the specification, there is no description regarding either the fixed program decoder 20 or the programmable processor 26 carrying out the function of producing decoded symbol data. Both decoders are given count information from the "common timing means," though the end product of "decoded symbol data" is not elucidated. It can be inferred from the entirety of the description in the specification, that with respect to the involvement of the fixed program decoder 20 and the programmable processor 26, both decoders serve to produce decoded symbol data. That the decoders may be programmed to decode a certain type of or multiple types of data is not critical to this determination. No distinction between types of data produced or types of programs installed in the decoders is made in the claim language of the patent or in the specification. Furthermore, there is no relevant prosecution history to the contrary.

After reviewing the specification language and the claim language, the Court construes the function of the means as *to process digital data from the supplied data signal to produce decoded symbol data representative of the bar code symbol being scanned by said scanning device producing the supplied digital signal*. The Court finds the structure corresponding to this function as *a structure consisting of either the programmable processor 26 or the fixed program decoder 20*. There is no requirement that the structure must consist of both the programmable processor 26 and the fixed program decoder 20.

III. *CONCLUSION*

In conclusion, the Court construes the following terms as follows:

Patent	Term	Claim Construction
'359/'731	"Cooperating with said first optical filter element so as to form a band-pass optical filtering system"	The two filters, one of which transmits light of wavelengths just below and above a predetermined wavelength, the other transmitting light of wavelengths just above and below the predetermined

		wavelength, cooperate to form a narrow bandpass optical filter which does not exist before the cooperation between the two filters.
'359/'731	"Scan data processing means"	Function: to process data indicative of said detected light intensity Corresponding structure: A/D Conversion Circuit 13 and Amplifier 55
'852	"An optical bench mounted in said compact housing and extending along a central reference axis"	A rigid structure within the housing of the scanner to which optical components are mounted to prevent movement of the individual optical components relative to each other.
'852	"Highly collimated projected scanning pattern"	A scanning pattern of scan lines that is columnar in nature, or as columnar as possible, given practicable constraints.
'852	"Narrowly confined scanning volume"	A volume that is narrow, yet diverging, from the transmission window of the scanner, which may take a pyramidal, conical, irregular, or similar shape.
'342	"Means for generating	Function: to generate a

	a plurality of predetermined frequencies"	plurality of predetermined frequencies, predetermined meaning that the division of clock pulse frequency by two is constant. Corresponding structure: Clock Input 12, which is either the Crystal Oscillator 13 or other External Clock 15, and the Clock Circuitry Divider 14.
'342	"Means for measuring the time duration of each of said first and second levels of said digital input signals using one of said plurality of frequencies and producing digital data representing said measured time durations for use by"	Function: to use a frequency from one of the predetermined frequencies, thereby selecting a frequency, according to the scanner type that is inputted into the structure and to process output signals from the input means so as to produce digital data representing measured time durations, allowing counting of the clock structure by further means. Corresponding structure: Clock Mux 16, Transition Detector 24,

		Sequencing Means 28, and Digitizer Counting Means 30
'342	"Decoder means for decoding said code symbol"	Not an affirmative limitation.
'342	"Said device comprises a second decoder for receiving said processed signals, said second decoder being programmable for decoding a second type of bar code or other digital code"	Decoder must be programmable to decode a wide variety of codes and a symbology, and refers to a programmable processor.
'027 [24]	"Common timing means"	Function: to measure the time durations of the digital data signals using the frequency appropriate for the scanner type selected. Corresponding structure: Clock Input 12(either Crystal Oscillator 13 or other external clock 15), Clock Divider Circuitry 14, Clock Mux 16, and Counters 50 and 52.
'027	"Common data	Function: to process

		digital processing means"
		data from the supplied digital data signal Corresponding Structure: Either the Programmable Processor 26 or the Fixed Program Decoder 20.

FN24. As discussed earlier, because limitations 1, 2, 5, and 6 of claim 28 are identical to the limitations found in claim 1 of the '027 patent, Pl.'s '342/' 027 Markman Br. at 39, the Court's construction of the limitations of claim 1 will also apply to limitations 1, 2, 5, and 6 of claim 28. Furthermore, because limitations 3 and 4 of claim 28 are very similar to limitations 6 and 7 of claim 5 of the '342 patent. *Id*. Accordingly, the claim construction of limitations 6 and 7 of claim 5 of the '342 patent will apply to limitations 3 and 4 of claim 28.

The accompanying Order will be entered.

Appendix A: '359 and '731 Patents***-Limitations 1-11***

1. A laser code symbol scanning system, comprising:

[Limitation 1] a housing having a light transmission aperture through which visible light can exit and enter said housing;

[Limitation 2] a first optical filter element installed over said light transmission aperture, disposed along a laser light return path extending through said light transmission aperture,

[Limitation 3] and having wavelength-selective filtering characteristics in the visible band,

[Limitation 4] said first optical filter element functioning as a scanning window in said housing,

[Limitation 5] and preventing light having wavelengths up to slightly below a predetermined wavelength in said visible band from passing from the outside of said housing, through said scanning window, and into said housing;

and a scan data producing means disposed in said compact housing, for producing scan data indicative of the intensity of laser light reflected off a code symbol on an object located within at least a portion of a scan field defined external to said housing,

said housing, said scan data producing means including

[Limitation 6] a laser beam producing means for producing a laser beam characterized by said predetermined wavelength,

[Limitation 7] a laser beam scanning means for projecting said laser beam and repeatedly scanning said laser beam through said scanning window and across said scan field and said code symbol,

[Limitation 8] a laser light collection means for collecting along said laser light return path, laser light of said laser beam reflected off said code symbol and passing through said scanning window,

[Limitation 9] and a laser light detection means disposed along said laser light return path, for detecting the intensity of laser light reflected off said code symbol and collected by said laser light collection means, and automatically producing scan data indicative of the detected light intensity;

[Limitation 10] a second optical filter element, spatially separated from said first optical filter element, disposed along said laser light return path between said first optical filter element and said laser light detection means,

[Limitation 11] and having wavelength-selective filtering characteristics in said visible band[.]

Appendix B: '852 Patent***-Limitations of Claim 1***

1. A counter-top projection laser scanner for producing a narrowly confined scanning volume for scanning codes symbols therein, while preventing unintentional scanning of code symbols on nearby objects located outside thereof, said counter-top projection laser scanner comprising:

[Limitation 1] (a) a compact housing having a light transmission window through which laser light can exit said compact housing, travel towards an object bearing a code symbol and reflect therefrom, and at least a portion of said reflected laser light travel back through said light transmission window and enter said compact housing;

[Limitation 2] (b) an optical bench mounted in said compact housing and extending along a central reference axis;

[Limitation 3] (c) a laser beam producing means disposed within said compact housing from producing a laser beam;

[Limitation 4] (d) a laser beam sweeping means mounted within said compact housing with respect to said optical bench for rotation about a rotational axis which intersects said central reference axis, and where the intersection of said rotational axis and said central reference axis defines a central reference plane which extends along said optical bench for referencing the relative position of scanning components about said optical bench;

[Limitation 5] said laser beam sweeping means having at least first, second and third rotating light reflective surfaces each being disposed at a different acute angle with respect to said rotational axis, for sequentially sweeping the laser beam about said rotational axis along a plurality of different paths;

[Limitation 6] (e) a stationary array of at least first, second, third, and fourth and fifth stationary light reflective surfaces mounted within said compact housing with respect to said optical bench and disposed substantially under said light transmission window;

[Limitation 7] said first and second stationary light reflective surfaces being symmetrically disposed on opposite sides of said central reference plane, and closely adjacent said beam sweeping means, and

[Limitation 8] said third and fourth stationary light reflective surfaces being symmetrically disposed on opposite sides of said central reference plane, and closely adjacent said first and second stationary light reflective surfaces, and

[Limitation 8] said fifth stationary light reflective surface being disposed about said central reference plane, and closely adjacent said third and fourth stationary light reflective surfaces;

(f) a light collection subsystem disposed within said compact housing, and including

[Limitation 9] (1) a light collection element, mounted along said central reference plane, for collecting reflected laser light off said laser beam sweeping means, and

[Limitation 10] (2) light receiving means for receiving laser light from said light collection element at a point substantially within said central reference plane, and detecting the intensity of said received light and producing an electrical signal indicative of said detected intensity;

[Limitation 11] (g) signal processing means disposed within said compact housing, for processing said electrical signal and producing scan data representative of a scanned code symbol;

[Limitation 12] (h) control means within said compact housing for controlling the operation of said counter-top projection laser scanner so that, during scanner operation, the laser beam produced from said laser beam producing means passes along a portion of said central reference plane, to the first, second and third rotating light reflective surfaces of said laser beam sweeping means, and as the laser beam sequentially reflects off said first, second and third rotating light reflective surfaces, the laser beam is repeatedly swept across said first, second, third, and fourth and fifth stationary light reflective surfaces thereby producing first, second, third, and fourth and fifth groups of plural scan lines, respectively, which are projected out through said light transmission window and intersect about a projection axis within a narrowly confined scanning volume extending from adjacent said light transmission window to at least about six inches therefrom so as to produce a highly collimated projected scanning pattern within said narrowly confined scanning volume,

[Limitation 14] (i) said compact housing being supportable relative to a counter-top surface so that, during scanner operation, said highly collimated scanning pattern is projected about said counter-top surface within said highly collimated scanning volume, and

[Limitation 15] when a code symbol is presented within said narrowly confined scanning volume, (i) the code symbol is scanned omnidirectionally by said highly collimated scanning pattern while preventing unintentional scanning of code symbols on objects located outside of said narrowly confined scanning volume,

[Limitation 16] (ii) at least a portion of the laser light reflected from said scanned code symbol is directed through said light transmission window, reflected off at least one of said first, second, third, fourth and fifth stationary light reflective surfaces, and then reflected off at least one of said first, second and third rotating light reflective surfaces of said laser beam sweeping means,

[Limitation 17] (iii) thereafter said reflected laser light off said laser beam sweeping [means] is collected by said laser collection element, and received by said light receiving means for detection, and said electrical signal is produced for processing by said signal processing means.

Appendix C: '342 Patent***-Limitations 1-9 of Claim 5***

5. [Limitation 1] A device for processing plural digital input signals,

[Limitation 2] each said digital input signal having first and second levels,

[Limitation 3] and being provided to said device by at least one input means,

[Limitation 4] and each said digital input signal representing a code symbol recorded on a medium read by said input means

[Limitation 5] the frequency of each said digital input signal from said input means being a function of the type of said input means and the resolution of said code symbol as recorded on said medium, said device comprising

[Limitation 6] means for generating a plurality of predetermined frequencies and

[Limitation 7] means for measuring the time duration of each of said first and second levels of said digital input signals using one of said plurality of frequencies and producing digital data representing said measured time durations for use by

[Limitation 8] decoder means for decoding said code symbol

[Limitation 9] said device comprises a second decoder for receiving said processed signals, said second decoder being programmable for decoding a second type of bar code or other digital code.

Appendix D: '027 Patent***-Limitations of Claims 1, 6, and 28***

1. [Limitation 1] A digital signal processing device capable of decoding a plurality of digital data signals, wherein each said digital data signal is produced as output from a scanning device and has first and second signal levels of variable time duration which undergo signal level transitions in accordance with a bar code symbol being scanned by said scanning device, said digital signal processing device comprising:

[Limitation 2] (a) a plurality of data input ports, each said data input port being operably connectable to one said scanning device, for supplying one said digital data signal to one said data input port for processing;

[Limitation 3] (b) signal level transition detection means for detecting the signal level transitions in the digital data signal supplied to any one of said plurality of data input ports, and producing signal level transition data for the supplied digital data signal;

[Limitation 4] (c) connection means for operably connecting said data input ports to said signal level transition detection means;

[Limitation 5] (d) common timing means for measuring the time duration of the first and second signal levels between detected signal level transitions in the supplied digital data signal, and producing digital data related to the time duration of the first and second signal levels in the supplied digital data signal;

[Limitation 6] (e) common control means for controlling the operation of said common timing means in response to signal level transition data produced from said signal level transition detection means;

[Limitation 7] (f) common data processing means operably associated with said common timing means and programmed for processing said digital data from the supplied digital data signal, so as to produce decoded symbol data representative of the bar code symbol being scanned by said scanning device producing the supplied digital signal;

[Limitation 8] (g) a data output port operably associated with said common data processing means and for providing the decoded symbol data to a host device operably connectable to said data output port;

6. [Limitation 9] The digital signal processing device of claim 1, wherein said plurality of data input ports, said signal level transition detection means, said connection means, said common timing means, and said common control means are physically realized in an integrated circuit device.

28. [Limitation 1] A digital signal processing device capable of decoding a plurality of digital data signals, wherein each said digital data signal is produced as output from a scanning device and has first and second signal levels of variable time duration which undergo signal level transitions in accordance with a bar code symbol being scanned by said scanning device, said digital signal processing device comprising:

[Limitation 2] (a) a plurality of data input ports, each said data input port being operably connectable with one said scanning device for supplying one said digital data signal to one said data input port for processing;

[Limitation 3] (b) clock signal generating means for generating a plurality of predetermined clock signals, each said predetermined clock signal having a frequency which is suitable for use in measuring the time duration of the first and second levels of at least one of said digital data signals;

[Limitation 4] (c) timing means for measuring the time duration of each of said first and second levels of the supplied digital data signal using one of said plurality of predetermined clock signals and producing digital data representing said measured time durations;

[Limitation 5] (d) common data processing means operably associated with said timing means and programmed for processing said digital data from the supplied digital data signal, so as to produce decoded symbol data representative of the bar code symbol being scanned by said scanning device producing the supplied digital signal; and

[Limitation 6] (e) data output port operably associated with said common data processing means, for providing the decoded symbol data to a host device operably connectable to said data output port.

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