United States District Court,
C.D. California.

APS TECHNOLOGY GROUP, INC,
Plaintiff.
v.
PACECO CORP,
Defendant.

No. CV 06-3818 MRP (AJWx)

Nov. 9, 2007.

Kirk T. Bradley, Michael D. McCoy, Alston and Bird, Charlotte, NC, Terry W. Bird, Thomas R. Freeman, Bird Marella Boxer Wolpert Nessim Drooks and Lincenberg, Los Angeles, CA, for Plaintiff.

Alexandra M. Sepulveda, Eric P. Jacobs, Robert A. McFarlane, Townsend Townsend & Crew, Lynn L. Krieger, Rupert P. Hansen, Jr., Cox Wootton Griffin Hansen & Poulos, San Francisco, CA, for Defendant.

CLAIM CONSTRUCTION ORDER

MARIANA R. PFAELZER**, District Judge.**

I.

INTRODUCTION

In this declaratory relief action involving patent infringement, Plaintiff APS Technology Group, Inc. and Defendant Paceco Corporation seek construction of nine (9) terms in Paceco's U.S. Patent 6,356,802 ("The '802 Patent") and three (3) terms in Paceco's U.S. Patent 6,768, 931 ("The ' 931 Patent"), in accordance with Markman v. Westview Instruments, Inc., 517 U.S. 370 (1996). This Court held a *Markman* hearing on November 1, 2007, where both parties presented argument. Paceco also submitted a declaration by its expert, Kendyl A. Roman, as well as a declaration by Paceco employee Henry King and a confidential declaration by attorney Robert McFarlane.

II.

BACKGROUND

A. Technology

The technology in this case involves systems for locating and tracking cargo containers during loading,

unloading, transportation, and storage at a seaport (or a rail yard.) *See* '802 Patent at 1:11-41. Cargo containers used in national or international shipping come in various standardized sizes and are required to have a unique identification code consisting of numbers and letters painted on the container's side and roof. *See* "1 Patent at 2:19-26. Typically, after a cargo boat pulls up to the dock at a seaport, a wharfside (or "quay") crane latches onto the container and lifts it off the boat and onto the shore. FN1 The container can then be placed on a truck chassis and transported to a storage yard, where it will be assigned a specific storage location and stored pending further transport. *See* '802 Patent at 1:34-42. At the storage yard, a "transfer container crane" may be used to lift the container off the truck chassis and into the designated storage location. *See* ' 931 Patent at 1:49-53, Fig. 1. The order of these steps is reversed when containers are loaded from a seaport onto a boat.

FN1. Quay cranes can lift containers along two axes of motion: vertically (along a "hoist" axis), and horizontally along a rail (a "trolley" axis). *See* Plaintiff APS Technology Group, Inc.'s Opening Brief on Claim Construction [hereinafter Pl.'s Op. Br .] at 6-7. Typically, the orientation of the trolley rail is perpendicular to the dock. *Id*. The quay crane itself is also mobile, mounted either on rubber tires or along rails that run parallel to the dock. *See, e.g.,* Declaration of Henry King in Support of Defendant Paceco Corp.'s Opening Claim Construction Brief [hereinafter King Decl.] para.para. 5-7.

A container terminal management system ("CTMS") or "container inventory management system" (or "CIMS") may be used to automate management of container loading, transportation, and storage. A CTMS is a modular system that automates many basic seaport operations, which can include not only inventory management, but vessel planning, storage yard operation, and others. *See* King Decl. para. 9. A CIMS is a system dedicated to inventory management only. "1 Patent at 4:61-64. It may be implemented either as a separate system, or integrated into an existing CTMS. FN2 *Id*. As conceptualized in the '802 and ' 931 Patents, a CTMS or CIMS manages inventory at least in part by maintaining a database with (i) information identifying each cargo container in the seaport and (ii) information describing each container's location.

FN2. As Paceco emphasizes in its claim construction brief, the invention in the '802 Patent is designed to work with a CTMS, but the invention in the "1 Patent is designed to work with a CIMS. It is important to note that container inventory management is only one function that can be performed by a CTMS.

The '802 and "1 inventions disclose methods, apparatuses, and systems that provide a CTMS or CIMS with updated tracking information for cargo containers. A prior problem with container terminal management systems was that lost or misplaced containers were effectively rendered invisible to the CTMS. *See* ' 802 Patent at 2:25-33. Once lost to the CTMS inventory database, the container could only be recovered through time-consuming, random searching. *See* '802 Patent at 2:56-63. Accordingly, both the '802 and "1 inventions focus on providing updated information about a container's identification and location at various points during its journey through the terminal. This has the potential to reduce inefficiencies stemming from lost or missing cargo.

B. Litigation History

Paceco is the owner of the '802 and "1 patents. In a letter to APS dated January 27, 2006, Paceco asserted that APS infringed the '802 and "1 patents and stated that if APS did not take a license, Paceco would "have no choice but to turn this matter over to [its] attorneys for enforcement" and "seek all possible remedies."

(First Amended Complaint para. 6.) APS then filed this suit on June 16, 2006 seeking a declaratory judgment that it does not infringe either patent; that both patents-in-suit are invalid; and that the ' 931 patent is unenforceable. APS also asserted various state law causes of action. In its answer, Paceco denied all material allegations and raised counterclaims alleging infringement of the '802 and "1 patents. It further raised a number of affirmative defenses.

On January 19, 2007, the case was transferred to this Court. The Court held a *Markman* hearing on November 1, 2007.

C. The Patented Inventions

The inventions claimed by the '802 and the "1 patents are directed towards computerized tracking of cargo containers. FN3 The ' 802 Patent relates broadly to "a method and apparatus for locating cargo containers," while the ' 931 Patent involves a narrower "method and apparatus for quay container crane-based automated optical container code recognition with positional identification."

FN3. The '802 Patent and/or the "1 Patent may apply to container storage in other contexts besides seaports, such as rail yards. *See* '802 Patent at 3:48-50, 4:45-56. However, the focus in this case is on seaports.

1. *The* '802 Patent

The '802 Patent is directed to methods, apparatuses and systems for updating, in a CTMS database, the known location of cargo containers stored in a container terminal storage area. '802 Patent at 3:48-50. The invention employs two principal components that allow it to update the location information for containers in the database: first, a "transportable identification means reader" that remotely obtains the container's identification code (creating a first electronic signal); and second, a "means for generating a second electronic signal" (also known as a "location determining unit") that encodes the location of the container in a storage area. '802 Patent, Claim 1. The identification means reader can be, among other examples, an OCR camera system FN4, a magnetic tag reader, or a radio transponder tag reader. Id. at 1:49-67, 2:1-11, 4:65-67, 5:1-53. As for the location determining unit, the ' 802 Patent describes various possibilities that depend on how individual repository addresses are marked in the container storage area. It suggests, for example, an OCR reader, a GPS system, or even a human operator with a keypad who manually inputs the storage location for each container. Id. at 6:17-32.

FN4. OCR technology can be used to recognize the unique sequence of letters and numbers of the ID code on the outside of the container. *See* Roman Decl. para. 51 (explaining that OCR uses "[v]arious pattern matching techniques and algorithms" to "match the text characters on the image of the page to a known set of character patterns.").

The two principal components of the invention are mounted on a mobile "transporter" that can move around the container storage area, such as a cart on wheels or rails. *See* id. at 6:40-42. Once the container's ID and storage address have been obtained, both pieces of information are "integrated" and sent together from the transporter to the CTMS (wirelessly or by other methods of data transfer), where they are used to update the location of the container in the CTMS inventory management database. *See* '802 Patent at 3:62-67, 8:55-59.

The prosecution history of the '802 Patent is surprisingly short. The examiner allowed all eight claims in

nearly original form after making an Examiner's Amendment, which was accepted by the applicants. '802 Prosecution History. The Amendment made minor changes to the text of the claims. It also included the examiner's reasons for allowance, though they do not shed much light on the course of the prosecution. Id. (stating only that none of the references considered, either individually or in combination, anticipated the claims).

2. *The* "1 Patent

Like the '802 Patent, the "1 Patent discloses methods and systems for computerized tracking of cargo containers. However, the "1 Patent is drawn more narrowly than the '802 Patent in several ways. It is directed only towards systems that use an OCR camera system to identify a container code (and not systems employing, for example, magnetic or radio transponder tag readers.) Also, the "1 Patent is specifically directed towards an OCR system mounted on a quay container crane (i.e., the crane that unloads a container from a docked ship at a seaport), while the '802 Patent is directed towards a machine reader that can be mounted on any "transporter." A typical embodiment involves multiple cameras rigidly affixed to the seaside legs of the crane. *See* "1 Patent at 4:7-8, 9:49-53, Fig. 12-Fig. 13. The OCR cameras read the container code as the container passes by, through the crane legs. *See id*. at 12:44-49, Fig. 12.

The invention claimed by the "1 Patent also differs in the way that it specifies where a cargo container is at any given time. While the '802 Patent focuses on determining a repository *address* in a storage area at discrete points in time, the "1 Patent is directed in part towards the real-time monitoring (or at least more frequent updating) of a container's *position* as it moves through a seaport. The patent specifically discloses three possible components of this positional information: (i) a "loading-operation designation" (describing the cargo container's position while it is being lifted by a quay container crane); (ii) a "terminal location" (indicating the location of the shipping terminal where the quay crane is located); and (iii) a "storage-location designation" (indicating where a container is being stored). *See* "1 Patent at 10:47-51. The "loading-operation designation" is by far the most important of these three. That designation can further be broken down into at least two components: an indication of whether a crane has locked onto a container (often called the "locking indication" or "twist locking status," *see id*. at 9:23-25), and an indication of hoist-trolley position, *see id*. at 12:21-32.FN5 *See also* ' 931 Patent, Claim 1. The ' 931 Patent discloses a wide variety of technologies that can be used to measure these three indications of position.FN6

FN5. The "1 Patent clarifies that the "hoist position" refers to both "hoist" and "trolley" values. Id. at 12:31-32.

FN6. Information on the crane's hoist, trolley, and hook positions can be provided by any of the following means: the crane's relay controls or Programmable Logic Controller (PLC); laser or infrared sensors; ultrasonic transponders; or a coded hoist shaft that uses a gray code. *See* "1 Patent at 9:18-25, 13:48-56.

The "1 Patent also employs different terminology than the '802. Unlike the '802, the "1 communicates with a "container *inventory* management system," or "CIMS," not a CTMS. A CIMS may be a separate system for managing inventory, or it may be integrated with the CTMS. *See* "1 Patent at 4:62-64. In addition, the "1 Patent does not describe container identification and location data in terms of first and second electronic signals. Rather, the container identification data received from the OCR system is called the "optical characteristic"; it contains not only the recognized container code of numbers and letters but "at least one

video image [presumably of the container], which is compressed" so as to minimize bandwidth during transmission to the CIMS. "1 Patent at 5:3-4, 10:34-44. Similarly, the ' 931 patent describes location in terms of "positional identification," as described in the previous paragraph, instead of just a storage "address."

The "1 is a descendant (essentially a continuation-in-part) of the '802 patent. On July 9, 2002, three months after its original application filing date, the applicants filed two preliminary amendments that (i) made slight changes to the specification and added over twenty additional claims; and (ii) supplied a missing drawing, Figure 4B. Subsequently, in an Office Action dated September 4, 2003, the examiner allowed claims 1-30 (i.e. every one of the original claims included before the preliminary amendment). It further rejected independent claims 31 and 44 (plus a number of claims dependent upon those two claims) on obviousness grounds, 35 U.S.C. s. 103, over U.S. Pat. No. 5,780,826 ("The Hareyama '826 Patent"), the details of which are not relevant here.FN7 The examiner also conditionally allowed claims 32-35, 37, 43, and 45 (which are all claims dependent on claims 31 or 44) provided they were rewritten to avoid dependency on claims 31 and 44.

FN7. The examiner also rejected Claims 39, 40, 52 and 53 based on 35 U.S.C. 112, second paragraph for lack of antecedent basis for the term, "said sending-data collection." However, this rejection was withdrawn without need for amendment after an interview between the Examiner and the applicant's agent. (*See* '802 Prosecution History.) The rejection seems to have stemmed from a misunderstanding by the examiner, which was cleared up in the interview.

The applicants responded by withdrawing claims 31 and 44 FN8; changing a number of the conditionally allowed claims (32, 37, 45 and 50) from dependent to independent; and rewriting the other rejected or conditionally allowed claims so that they now depended from one of the newly independent claims. The Examiner then placed the application in condition for allowance.

FN8. The applicants stated that they were withdrawing Claims 31 and 44 in order to expedite prosecution of the application, emphasizing that they intended to argue the issue of obviousness over the Hareyama reference in a future continuation application.

III.

LEGAL STANDARD

"[T]he construction of a patent, including terms of art within its claim, is exclusively within the province of the court." Markman, 517 U.S. at 372. During claim construction, "[t]he words of a [patent] claim are generally given their ordinary and customary meaning," that is, "the meaning that the term would have to a person of ordinary skill in the art in question ... as of the [patent's] effective filing date." Phillips v. AWH Corp., 415 F.3d 1303, 1312-13 (Fed.Cir.2005) (*en banc*). Furthermore, the specification is "always highly relevant" in construing a claim. Id. at 1315. Where a claim term is disputed, the specification is in fact "the single best guide to the meaning of a disputed term" and will usually be dispositive as to its meaning. *Id*.

At the same time, the court must avoid importing an improper limitation from the specification into a claim, for example, by confining a claim to the embodiments listed in the specification when it is not warranted. *Id*. at 1323; E.I. DuPont de Nemours & Co. v. Phillips Petroleum Co., 849 F.2d 1430, 1433 (Fed.Cir.1988).

This problem is avoided if the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which a disputed term appears, but in the context of the entire patent, including the specification. Phillips v. AWH, 415 F.3d at 1313. In short, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention [in the specification] will be, in the end, the correct construction." Id. at 1316 (quoting Renishaw PLC v. Marposs Societa' Per Azioni, 158 F.3d 1243, 1250 (Fed.Cir.1998)).

In addition to consulting the specification, a court should also consider the patent's prosecution history, if it is in evidence. Id. at 1317. Like the specification, the prosecution history provides evidence of how the PTO and the applicant understood the patent, as "well as whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be. " *Id*.

IV.

CLAIM CONSTRUCTION

A. Agreed Claim Terms

The parties have agreed to the construction of the following term:

Claim Term	Patent	Agreed Construction
"image"	"1	optical representation

B. Disputed Claim Terms

The parties disagree on the construction of the following claim terms, clauses or phrases as shown in the tables below:

'802 Patent		
Claim Term	**APS's Proposed Construction**	**Paceco's Proposed Construction**
"container terminal management system"	A system that manages a database of container IDs and of addresses of containers in a container terminal storage area. The system includes a central processing computer for receiving and storing container IDs and container addresses, verifying from the database whether a container is deposited at the proper address, and updating the database.	Processing system comprising one or more computers for managing information related to containers in a terminal.
"transporter"	A vehicle or other unit that can move around a container terminal storage area while transporting an optical character recognition (OCR) unit and a global positioning system (GPS) unit.	Unit used to move something.
"storage area"	A place for storing cargo containers within a terminal that has distinct repository addresses for storing the containers.	Area used for storing containers.
"address"	An identifiable designation of a repository location within a cargo container storage area for storage of a cargo container.	Information for identifying location.

Means-plus-function terms under 35 U.S.C. s. 112, para. 6		
"means for generating a second electronic signal which identifies any particular repository address in said storage area and which can be processed by said container terminal management system"	*Function:* generating a second electronic signal which identifies any particular repository address in said storage area and which can be processed by said container terminal management system.	*Function:* Generating a second electronic signal which identifies any particular repository address in said storage area.
	Structure: a location determining unit, i.e., a global positioning system (GPS) unit.	*Structure:* A location determining unit, such as a radiometer, an electronic magnometer, a radio transmitter/receiver, an optical character reader, a global positioning system (GPS) receiver, a hand-held computer input module, a keypad, or switches.
"means for transporting said identification means reader and said means for generating a second electronic signal together whereby when a container identification means is interrogated the location of said container is correlated with an address in said storage area"	*Function:* transporting said identification means reader and said means for generating a second electronic signal together whereby when a container identification means is interrogated the location of said container is correlated with an address in said storage area.	*Function:* transporting said identification means reader and said means for generating a second electronic signal together.
	Structure: a transporter such as a cart, storage yard patrol truck, or mobile rover unit.	*Structure:* a crane, track-based cart, steerable cart, or truck.
"means for transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to a central processing computer of said container terminal management system for verification from said database thereof whether said container is deposited at the proper address and updating said database"	*Function:* transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to a central processing computer of said container terminal management system for verification from said database thereof whether said container is deposited at the proper address and updating said database.	*Function:* transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to a central processing computer of said container terminal management system.
	Structure: a CPU, floppy disk drive, transportable data storage unit such as a floppy disk, and a CTMS computer; a wireless modem and a CTMS computer; a communication unit and a CTMS computer.	*Structure:* A wireless modem; an antenna; a CPU and a floppy disk drive; a floppy disk; a transportable data storage unit; or a communications unit.
"means for integrating said first and second electronic signals"	*Function:* integrating said first and second electronic signals.	*Function:* integrating said first and second electronic

		signals.
	Structure: a computer onboard the transporter.	*Structure:* a computer.
"means for wirelessly transmitting said first and second combined ID and address electronic signals of said container to a central processing computer of said container terminal management system for verification from said database thereof whether said container is deposited at the proper address"	*Function:* wirelessly transmitting said first and second combined ID and address electronic signals of said container to a central processing computer of said container terminal management system for verification from said database thereof whether said container is deposited at the proper address. *Structure:* a wireless modem and a CTMS computer; a communication unit and a CTMS computer.	*Function:* wirelessly transmitting said first and second combined ID and address electronic signals of said container to a central processing computer of said container terminal management system. *Structure:* a wireless modem, an antenna, a CPU and a floppy disk drive, a transportable data storage unit, a wireless communications unit, and a floppy disk.

'931 Patent		
Claim Term	**APS's Proposed Construction**	**Paceco's Proposed Construction**
"container inventory management system"	A system that tracks inventory of containers by managing a database of optical characteristics of container codes and positional identifications of containers. The system includes a central processing computer for receiving and storing the optical characteristics and positional identifications, verifying from the database whether a container is deposited at the proper address, and updating the database.	Processing system for managing information related to an inventory of containers.
"positional identification"	An indication of global position obtained by tracking current location within a terminal container shipping yard.	Information for identifying location.
"loading-operation designation"	An indication of the locking status and hoist position during loading or unloading from a ship.	Information regarding position and/or locking status during loading or unloading.

1. ***The Court's construction***

a. "container terminal management system" ("CTMS")

This term is used widely throughout the '802 Patent and appears in Claims 1 and 5-8. Paceco argues for a broad, permissive construction of the term ("processing system comprising ... computers for managing

information related to containers in a terminal"), noting that "the claimed inventions do not expressly include the ... CTMS," but are merely "in communication with it" Defendant's Opening Claim Construction Brief [hereinafter Def.'s Op. Br.] at 10. In contrast, APS proposes "a system that manages a database of container IDs and of addresses of containers in a container terminal storage area," with the additional restrictions that the system have a central processing system capable of managing, verifying, and updating the container IDs and addresses in its database. APS argues that "[t]he container IDs and addresses are essential to the CTMS" and that failure to include them in any definition of the term would prevent the '802 invention from working properly. Pl.'s Op. Br. at 11-12. The Court agrees with APS's reasoning on this point.

Container terminal management systems are not new. Plaintiff's expert, Kendyl Roman, notes that CTMS's were "well known in the art ... before 2000." *See* Roman Decl. para. 81; King Decl. para. 9 (stating that Mitsui, Paceco's corporate parent, began work on a CTMS in the mid-1970s). Giving "container terminal management system" its ordinary and customary meaning, a person of ordinary skill in the art on the filing date of the '802 Patent would understand it broadly to mean a computer system capable of handling at least some of the various tasks involved in running a seaport, such as inventory management, vessel planning, and yard operation.

At the same time, the Court reads the disputed claim term in light of the entire patent, including the specification. The '802 Patent declares that "[t]he function of the present invention is for it to reliably, under all real-life environmental conditions, read the ID numbers from a container, determine the current location of the container, then wirelessly transmit this data back to the CTMS," '802 Patent at 8:55-59, and that the purpose of this invention is "locating errors and updating a CTMS database," *id*. at 3:54-57. Clearly, if a CTMS did not have a database of container IDs and corresponding container location information, the invention could not achieve its stated goals. The CTMS would not even be able to understand the container ID and location data sent to it, much less utilize that information to update positional information and locate errors. It is irrelevant that the CTMS is not part of the claimed invention. The CTMS must still be able to understand the first and second combined signal that is transmitted from the invention to the CTMS. This requires that the CTMS maintain a database of container IDs and their corresponding storage area addresses.

Seeking to avoid this limitation, Paceco argues that "container terminal management system" is used in many different ways throughout the '802 Patent and thus should be accorded a broader definition capable of encompassing all the varied uses of that term. *See* Def.'s Op. Br. at 11 (citing Johnson Worldwide Assoc., Inc. v. Zebco Corp., 175 F.3d 985 (Fed.Cir.1999); Roman Decl. para. 81. Drawing on the differences in how Claims 1, 6, and 7 reference the CTMS FN9, Paceco argues that the term "CTMS" should not be saddled with the limitation of a database containing codes and locations.

FN9. The preamble of claim 1 refers to a "[CTMS] containing a database of information related to container ID numbers and letters and the location of containers in said terminal area." Claim 6 describes the CTMS "containing a database of information related to the location of containers" but does not mention container ID codes. Finally, Claim 7 mentions a "CTMS database" without listing either container IDs or location information.

Paceco's use of *Johnson Worldwide* is inapposite. "CTMS" is in fact used consistently in each claim of the patent: it refers to a processing system that contains a database of at least container IDs and corresponding addresses. Claims 1, 6, and 7 each disclose that a combined electronic signal encoding both container ID

and location is sent to the CTMS database for " *verification* ... whether said container is deposited at the proper address." Claims 1 and 7 further refer to " *updating* said database." In order to "verify" or "update" a container's location, the database must ostensibly contain pre-existing information about specific container codes and their locations. Nothing about the usage of "CTMS" in the specification or any of the claims suggests otherwise.FN10

FN10. In addition, under *Johnson Worldwide,* it is proper to limit the scope of a term where the patent applicant has created a "special and particular definition." *Id*. at 991. In requiring that the CTMS be able to communicate with the '802 invention by receiving container codes and locations that update a CTMS inventory database, the patentee has arguably created its own special definition for the term.

However, the Court does not agree with APS's further limitation specifying that a central processing computer in the CTMS must be capable of verifying and updating container codes and locations in its database. Once it is established that a CTMS contains a database of container ID codes and storage addresses, and that the CTMS can receive information about a container's location (from the invention), verification and updating follow naturally. The CTMS can obviously *compare* newly received information with the information previously stored in the CTMS database ("verifying" the existing data), and, if necessary, *replace* the old data with the new data ("updating" it). Thus, verification and updating capabilities are not material limitations of the CTMS, because they do not place further restrictions on how the CTMS interacts with the invention of the '802 Patent.

Finally, the Court recognizes Paceco's concern that a shipping terminal may have multiple container terminal storage areas. (*See* Def.'s Response at 4.) It adjusts its construction accordingly.

For these reasons, "container terminal management system" is construed as " *a processing system comprising one or more computers for managing information related to containers in one or more container terminal storage areas, in which the system manages at least a database of container ID codes and of addresses of containers in those storage areas*."

b. "transporter"

This term appears in Claims 6 and 7 and appears to be the analogue of the means-plus-function term, "means for transporting ..." in claim 1. Paceco argues it should be interpreted simply as a "unit used to move something," while APS would describe it as "a vehicle or other unit that can move around a container terminal storage area while transporting an optical character recognition (OCR) unit and a global positioning system (GPS) unit." In the context of the invention, the "transporter" is the device or vehicle upon which the two primary components, the ID reader (such as an OCR camera system) and the location determining unit (such as a GPS device) are mounted. *See* '802 Patent at 6:40-42 ("The machine [identification] reader, its associated apparatus, and the LDU [location determining unit] are carried onboard a transporter....").

Transporters come in various shapes and sizes. The specification discloses a "cart which runs on tracks or can be steerable ... either operator driven or remotely controlled," or a "storage yard patrol truck." *Id*. at 6:40-45. The patent also refers to a "mobile rover unit," *id*. at 7:66-67, and a "mobile transporter," *id*. Cl. 6. In the context of the patent, it is clear that being "mobile" is not a sufficiently accurate description. Rather, a "transporter" must be able to "traverse" a container terminal storage area, so that the machine reader and/or LDU carried onboard the transporter can "remotely interrogate" individual containers to obtain ID's and

addresses. *See id*. at 3:58-67 (stating that an object of the invention is to provide "a mobile apparatus which can traverse a container terminal storage area and remotely interrogate individual containers to determine their identity and address"). Thus, a cart which runs on tracks can be a transporter, even though it may not be absolutely "mobile" in all directions. In contrast, it is not clear that all cranes are "transporters," despite a suggestion in the written description that "[t]he system can be installed on cranes to identify containers at wharfside and on straddle carrier cranes," '802 Patent at 4:51-56.FN11

FN11. A quay crane can be mounted on rails parallel to the dock, or on tires, but it is not typically free to traverse a container terminal storage area.

Accordingly, the court construes "transporter" as " *a mobile unit that can traverse a container terminal storage area in a manner so as to allow a container ID means reader and a LDU carried onboard the transporter to remotely interrogate individual containers*." This definition obviates the need for APS's further proposed limitation that the transporter carry an OCR and GPS system. FN12

FN12. APS's proposed limitation is also too narrow because not every embodiment of the invention claimed in Claims 6 and 7 is limited to carrying an OCR and a GPS. While this is true of Claim 6, Claim 7 contemplates any mobile machine reader, not just an OCR reader.

c. "storage area"

Paceco and APS agree that a "storage area" is an area used for storing cargo containers. They differ, however, on whether a "storage area" must have "distinct repository addresses for storing the containers."

Reciting again the proposition that a term used broadly in one claim and narrowly in another should not be given a narrow construction applicable to all claims, Paceco argues that distinct addresses are not necessary for a "storage area." Def.'s Op. Br. at 12-13 (citing Georgia Pacific Corp., 195 F.3d 1322, 1331 (Fed .Cir.1999)). They note that Claim 1 describes a storage area "having an identifiable address for each container repository location in said storage area ..." while Claim 7 has no such modifier. According to this reasoning, claim 7 represents a broader usage of the term that does not require distinct repository addresses, and it would be improper to limit it in such a fashion by reading such a limitation into "storage area."

Paceco's argument is flawed in several respects. First, the usage of "storage area" in Claim 7 is not broader than that in Claim 1. Although Claim 7 does not have the same explicit restriction on "storage area" as Claim 1, Claim 7 does refer to "identifying the *address* of said container in said storage area ." *Id*. at Cl. 7 (emphasis added). The term "address" is consistently used throughout the '802 Patent to identify a specific repository address in a storage area. *See, e.g.,* id. at 2:12-19 ("[t]he addresses for identifying the repository locations for the containers"). And throughout the '802 Patent, a storage area is generally described as having distinct addresses for containers. *See* '802 Patent at 2:65-67, 3:1-3 ("[t]he present invention is a cargo container locating system ... wherein ... each container repository location in the storage area has an identifiable address"). Clearly, the "address" refers to a property of the "storage area," rather than some other property such as the container's alphanumeric ID code (as that code is mentioned separately in Claim 7.)

At the claim construction hearing, counsel for Paceco noted for the first time that the '802 invention alludes

to storage areas that "have individually separated but not necessarily identified repository addresses." ' 802 Patent at 4:32-36. However, the '802 Patent does not explain how the invention would work given a storage area with unmarked repositories, or with no distinct repositories at all. The specification discloses no other method, other than by pinpointing a repository address within a storage area, for describing a container's location. It does disclose various ways in which repository addresses can be marked *within* a storage area, including paint, monument markers or magnetic or transponder tags, id. at 5:54-62. It also discloses various storage area layouts, such as "multiple container stacking" or "geographically divided warehouses," id. at 4:48-51. However, these variations do not explain how a storage area (or for that matter, the claimed inventions) might function without the use of marked container repository addresses.FN13

FN13. The specification of the '802 Patent does state, without further elaboration, that the invention can move down a line of rail cars to "verify the positioning of the containers on the train for proper order." '802 Patent at 8:13-16. This appears to contemplate a different conception of container "position" based on relative order of containers in a line. However, it is a conception that is not encompassed by the claims, which are all directed towards identifying containers in a storage area. In any case, it does not suggest how the invention would function in a storage area without discrete address repositories.

Additionally, GPS, the only conceivable alternative to discrete repositories, is not sufficiently disclosed for this purpose. GPS is not frequently discussed in the specification, and where it is mentioned, it is employed solely to ascertain a repository *address,* rather than to provide some other independent measure of global location such as latitude or longitude. *See id*. at 6:34-39 ("GPS ... is utilized with the ID tag reader to supply of [sic] the *address* of the repository position ....") (emphasis added). Furthermore, the specification gives no hint as to how raw GPS information would be processed by a CTMS database that contains only ID codes and storage area repository addresses. As discussed below under "means for generating," the second electronic signal specifying a cargo container's location must be in a format that the CTMS can understand.

Thus, the usage of "storage area" in Claim 7 is consistent with the usage in Claim 1, and it is not improper to read the limitation requiring distinct addresses into the term. The Court construes "storage area" as " *an area for storing cargo containers within a terminal that has distinct repository addresses for storing the containers*."

d. "address"

As with "storage area," the argument over this term focuses on whether an "address" refers specifically to an identifiable repository location within a storage area. Because the Court has decided that a "storage area" does in fact have distinct repository addresses, it is not necessary to further construe "address" in terms of the definition of "storage area." Thus, the Court adopts the simple definition " *information for identifying the location of a cargo container in a container terminal storage area*."

The remaining five terms in the '802 Patent are means-plus-function terms (or "MPF" for short), which the Court construes as follows:

e. "means for generating a second electronic signal which identifies any particular repository address in said storage area and which can be processed by said container terminal management system"

i. function

The parties agree that "means for generating a second electronic signal" is a means-plus-function term, subject to 35 U.S.C. s. 112, para. 6. Construction of a means-plus-function term requires two steps: 1) determining the claimed function; and 2) identifying the corresponding structure in the written description performing that function. JVW Enters., Inc. v. Interact Accessories, Inc., 424 F.3d 1324, 1330 (Fed.Cir.2005).

In this case, the parties agree on the first part of the function for this means-plus function term: "generating a second electronic signal which identifies any particular repository address in said storage area." APS would add to this function the limitation that the second electronic signal can be processed by the CTMS. Paceco argues that this further limitation is unnecessary because it merely "states the desired result" of generating that signal. Def.'s Op. Br. at 16 (citing Lockheed Martin v. Space Systems/Loral, Inc., 324 F.3d 1308, 1319 (Fed.Cir.2003)). APS responds that the limitation is a "required characteristic" of the second electronic signal, not merely a result of generating it. Plaintiff APS Technology Group, Inc.'s Response to Defendant Paceco Corp.'s Opening Claim Construction Brief [hereinafter "APS Response Br."] at 11.

The Court adopts the additional limitation for two reasons. First, the claim language in *Lockheed* is distinguishable from the language at issue here. In *Lockheed,* a long descriptive clause appended to a means-plus-function claim term was held not to be a limitation on that term's function under s. 112, para. 6. 324 F.3d at 1315, 1319. However, in that case there was a clear causal connection, as well as a grammatical distinction, between the means-plus-function term ("means for rotating said wheel") and the descriptive clause that followed it (" *whereby* the attitude of said satellite is offset *in response to* the effect of *said rotating wheel* ..."). Id. at 1315 (emphasis added). Here, APS correctly notes that the two "which" clauses in this means-plus-function claim term (i.e., " *which* identifies any particular repository address" and " *which* can be processed") are completely parallel and could easily be reversed in position without changing their meaning. There is nothing in the claim language suggesting that the second "which" phrase is a causal or desired result of the preceding claim language. Further strengthening this interpretation is the fact that claim 6, in a non-means-plus-function context, also appends the same modifying phrase ("which can be processed by said container terminal management system") to the second electronic signal. *See also* '802 Patent at 3:13-16 (reiterating the same phrase in relation to the second electronic signal).

Second, the contested phrase does *not* merely state a desired result of the means-plus-function limitation. Rather, the phrase "and which can be processed by said container terminal management system" is a material limitation on the claim. Just because a second electronic signal is generated does not guarantee that the CTMS can understand that signal. One can easily imagine any number of second electronic signals that could be generated to describe container location that would be in a format that the CTMS simply cannot process. Since one of the main goals of the invention is to provide updated container ID and address location information *to* the CTMS, the limitation that the CTMS be able to process the signal encoding container location is required.FN14

FN14. Notably, claim 6 explicitly specifies that *both* the second *and* first electronic signals "can be processed by the container terminal management system."

Paceco's argument that the claimed inventions are in communication with the CTMS but do not include the CTMS is unhelpful here. If anything, it argues against Paceco's proposed construction because the invention can be "in communication with" the CTMS only if the second electronic signal generated "can be processed by" it. Thus, the Court construes the function of the "means for generating a second electronic signal ..." as

" *generating a second electronic signal which identifies any particular repository address in said storage area and which can be processed by said container terminal management system*."

ii. structure

Corresponding structures in a means-plus-function limitation are those that actually perform the recited function. *See* Asyst Techs ., Inc. v. Empak, Inc., 268 F.3d 1364, 1371 (Fed.Cir.2001). The parties agree that the function of generating the second electronic signal is performed by the corresponding structure of a "location-determining unit," or LDU. *See* '802 Patent at 6:18-20 ("The LDU generates a second electronic signal ..."). However, they disagree on what exactly an LDU should be. Paceco would allow a broad range of devices, ranging from a GPS receiver to a keypad, but the only structure APS would allow is a GPS receiver. In fact, APS argues that a GPS is the *only* possible LDU (and hence the only possible structure corresponding to this means-plus-function term).

APS makes several arguments in favor of limiting the corresponding structure of an LDU to a GPS. First, it asserts, without further elaboration, that "none of [Paceco's proposed structures except for a GPS] actually generate the [second] electronic signal." Def.'s Op. Br. at 16. Second, seizing upon specification language stating that the LDU's purpose is to identify "any particular container repository address *and location,*" APS claims that only a GPS is capable of reading *both* a container's "address," i.e., repository within a storage area, *and* its global "location." Paceco's Response to Defendant's Opening Claim Construction Brief [hereinafter Pl.'s Response Br.] at 11-12.) Thus, the argument goes, because structures like Paceco's keypad or electronic magnometer can only read a container's *address* within a storage area, but not its global *location* like a GPS can, they are not corresponding structures in this means-plus-function claim.FN15 Finally, APS points out that during prosecution the examiner identified a GPS as being the LDU in his reasons for allowance. *See* '802 Prosecution History, Notice of Allowability at 2-3.

FN15. The Court notes that APS's position in this argument is curiously at odds with its position on the "storage area" term. There, APS argued that a "storage area" must have distinct repository addresses. Yet here it would prevent any of the means that read these repository addresses (except for a GPS) from being structures that generate a second electronic signal.

APS's arguments for limiting the corresponding structure of an LDU to only a GPS are unconvincing. Its first assertion, that only a GPS can generate the second electronic signal, is wholly unsupported not only by the specification, but by APS's own briefs. After raising it in its opening brief, APS actually seems to have implicitly dropped that argument by failing to even mention it in its response brief. Instead, that brief raises, for the first time, APS's argument distinguishing "address" and "location." But that argument, too, is illusory. The specification makes no such distinction between the two terms because it in fact uses them interchangeably. *See, e.g.,* '802 Patent at 2:33-35 ("A cargo container can become lost ... when [it] is inadvertently placed in a different *location* (yard *address*) than the one assigned") (emphasis added). As explained above in the discussion of "storage area," the ' 802 Patent does not entertain a concept of container "location" save for that of a designated "address" within a storage area.FN16

FN16. The specification makes clear in every instance that location implies an address. The purpose of a location determining unit is "for identifying any particular container repository *address* ..." '802 Patent at 6:1-3 (emphasis added). *See also id*. at 2:26, 42-43 (noting the possibility that a container might be left at "the wrong address" or placed at a "supposedly vacant *location* " that is not in fact vacant) (emphasis

added); *id*. at 5:54-57 ("Each repository position or deposition *location* within a cargo container terminal storage area is provided with an address pinpointing its geographic location *within the storage area* ") (emphasis added). Obviously, if "location" referred to an absolute global location instead of distinct storage addresses, it would be nearly impossible to place a container at a "wrong" location or at a location that is already occupied by another container.

Of course, even if APS could demonstrate that the '802 Patent recognizes "locations" apart from storage "addresses," its argument would still fail. The recited function of this means-plus-function limitation requires only that a second electronic signal identify a container's "address." It does not require that the signal also pinpoint "location." In order to be considered a corresponding structure, a "location determining unit" need only perform the function as it has been defined by the Court-which follows APS's proposed definition word for word. Having defined the function in such a manner, APS cannot now manipulate the definition of "LDU" so as to effectively shift the definition of that function, affecting what they claim as the corresponding structure.

Lastly, the Court notes that APS has not successfully invoked the doctrine of prosecution disclaimer by pointing to the examiner's statement of reasons for allowance of the patent.FN17

FN17. In his reasons for allowance, the examiner noted that the prior art, "individually or in combination, do not anticipate the claimed combination including identification means (OCR 11) for generating a first signal from reading the container ID means, *means (GPS 15) for generating a second signal*.... " *See* '802 Prosecution History, Notice of Allowance, Examiner's Amendment (emphasis added).) APS argues that the doctrine of prosecution disclaimer applies and thus a GPS unit is the only proper "means for generating." However, the Federal Circuit explains that an applicant's silence in response to an examiner's characterization of a claim does not constitute a clear and unambiguous disavowal of claim scope. *See* Salazar v. Procter & Gamble Co., 414 F.3d 1342, 1344-1347 (Fed.Cir.2005); SanDisk Corp. v. Memorex Prods., Inc., 415 F.3d 1278, 1286 (Fed.Cir.2005). Even if it was a disclaimer, the examiner's boilerplate statement here does not suggest that GPS 15 is the only structure capable of determining the address of a container. It merely says that the combination with a GPS is not anticipated.

The Court now inquires what corresponding structures *are* capable of performing the recited function. As mentioned earlier, the parties agree that the "structure" is the LDU; the question, then, is what qualifies as an LDU. Both parties agree that a GPS unit can be the corresponding LDU structure, and it is sufficiently disclosed in the patent as performing the required function. *See* ' 802 Patent at 6:34-39 (describing use of GPS in "a more sophisticated version of the invention" to "supply ... the address of the repository position" to create a signal that is later combined and sent to the CTMS). In addition, Paceco points out that a variety of other structures disclosed in the patent are capable of reading an address. Depending on the nature of the address identifier used to mark individual repositories in a storage area, those structures include an optical character reader (for addresses painted on the pavement) FN18; an electronic magnometer (if magnetic tags are used); a radio transmitter/receiver (if radio transponder tags are used); or a radiometer (if radioactive monument markers are used). '802 Patent at 6:1-16. The Court finds that these potential structures are all sufficiently disclosed in the specification as performing the recited function.FN19

FN18. APS's argument that an optical character reader (OCR system) cannot function as both the container ID reader and the LDU is puzzling. *See, e.g.,* '802 Patent at 6:3-7 (noting that such a reader can serve both

purposes).

FN19. Based on language found in Paceco's opening claim construction brief stating that "the LDU may use several different structures ..." APS tries to argue that these listed structures are "[a]t best ... a portion of an LDU (or they work with an LDU)." *See* Pl.'s Response Br. at 12 (citing Def.'s Op. Br. At 16-17). However, the specification does not reflect any such understanding, nor does Paceco appear to be arguing for such an interpretation.

However, the Court does not agree with the other structures proposed by Paceco. First, the Court does not find that "additional switches" that "allow input to the onboard computer," *see* Def.'s Op. Br. At 17 (citing '802 Patent at 7:61-62), are qualifying structures. The specification's brief reference to these "switches" does not describe how they would allow a container address to be read. Likewise, the specification does not disclose the "hand-held computer input module" requested by Paceco. Lastly, the specification also suggests that a "less sophisticated" version would allow input of repository addresses by "the operator through a hand-held keypad." *Id*. at 6:28-33. By itself, the keypad cannot be corresponding structure because it does not perform the recited function of generating the second signal which identifies a repository address. While the keypad may technically generate the signal, it is the human operator that identifies and inputs the container's repository address using the keypad. It is well established that a human being or any part of one cannot serve as the "means" in a means-plus-function limitation. In re Prater, 415 F.2d 1393, 1406 (C.C.P.A.1969). Thus, neither the keypad nor the operator plus the keypad may be a corresponding structure.

Therefore, the Court finds the corresponding structure for this MPF limitation to be " *a location determining unit (LDU), such as a radiometer, an electronic magnometer, a radio transmitter/receiver, an optical character reader, or a global positioning system (GPS) receiver*."

f. "means for transporting said identification means reader and said means for generating a second electronic signal together ..."

This is the second means-plus-function term under 35 U.S.C. s. 112, para. 6 used in claim 1 and appears to be roughly analogous to the "transporter" term used in 6 and 7.

i. function

The parties agree that the function of this MPF limitation should at least include the phrase, "transporting said identification means reader and said means for generating a second electronic signal together." APS would include additional language from claim 1 in defining the function: "whereby when a container identification means is interrogated the location of said container is correlated with an address in said storage area." FN20 Paceco counters that this limitation is not necessary and that the claim language from which it is derived merely "states the desired result" the claimed function of transporting the two components together.

FN20. For reference, the relevant language from claim 1 is as follows: "means for transporting said identification means reader and said means for generating a second electronic signal together whereby when a container identification means is interrogated the location of said container is correlated with an address in said storage area ..."

The Court agrees with Paceco that the limitation is not necessary. The "whereby" clause in this case describes the typical situation when the container ID means reader interrogates a container and the LDU ascertains that container's location. When both of those devices are transported together, their outputs can easily be "correlated." Thus, like the "whereby" clause in Lockheed Martin, 324 F.3d at 1319, the "whereby" clause here clearly states a "desired result" of the recited function of transporting the ID means reader together with the LDU: making it easy to correlate the output from those devices for a given container in a storage area. Unlike the second "which" clause involved in the construction of the previous MPF term, "means for generating a second electronic signal," the "whereby" clause here adds nothing of substance to the claim and is not a material claim limitation.

However, the Court does require another limitation on the function of this MPF term. As discussed in the court's construction of "transporter," the "means for transporting" must successfully "traverse a container terminal storage area" so that the ID means reader and LDU can perform their job of remotely interrogating individual containers. *See* '802 Patent at 3:58-67. Again, the "means for transporting" does not need to be highly mobile. It just needs to be mobile enough so that the machine reader and the LDU can read the ID code and location, respectively. Accordingly, the function of this MPF claim term is " *transporting said identification means reader and said means for generating a second electronic signal together and traversing a container terminal storage area in a manner that allows them to remotely interrogate individual containers*."

ii. structure

APS proposes the corresponding structure as "a transporter such as a cart, storage yard patrol truck, or mobile rover unit." (This definition incorporates "transporter," a term already construed by the Court). Paceco instead proposes "a crane, track-based cart, steerable cart, or truck." Perhaps not surprisingly given that the accused APS device in this case involves a crane, Paceco places particular emphasis on the disclosure of "cranes" as corresponding structure. Noting that "interpretation of what [structure] is disclosed in the specification [for s. 112, para. 6 purposes] must be made in light of the knowledge of one skilled in the art," it argues that one of ordinary skill in the art "would recognize that cranes are mobile." Def.'s Response Br. at 14. Paceco cites the King Declaration, which describes Paceco's mobile Portainer and Transtainer crane products, as support. *See* King Decl. para.para. 5-7.

The structures suggested by APS are directly disclosed in the specification as performing the recited function and are cited by Paceco as well as APS. *See* ' 802 Patent at 6:40-45, 7:66-67, and claim 6 (noting that the machine reader and the LDU can be carried onboard a "transporter such as a cart which runs on tracks or can be steerable" or a "storage yard patrol truck.") However, cranes are not as fully disclosed in the '802 patent. As Paceco notes, the specification describes three different ways that the claimed system can be used on cranes:

-> "[t]he system can be installed on cranes to identify containers at wharfside"

-> "on straddle carrier cranes for identifying containers in single or multiple stack container storage"

-> "[t]he system can be installed on cranes to identify containers mounted ... on rail cars on harborside railroad tracks."

Def.'s Op. Br. at 18 (citing '802 Patent at 4:51-56).

Unfortunately, this disclosure is insufficient to support the construction that all cranes, or even all "mobile" cranes, should be considered corresponding structure. Even if all cranes used in marine shipping are mobile FN21, they are not all necessarily capable of traversing a storage area as required by the function of this MPF term.

FN21. As the Federal Circuit has noted, while extrinsic evidence can shed useful light on the relevant art, it is less significant than the intrinsic record in the claim construction process. Phillips, 415 F.3d at 1317. Here, the Mitsui cranes described in the King Declaration are helpful for context, but the Court construes the claims first and foremost in light of the specification.

Clearly, quay container cranes at wharfside cannot be a corresponding structure for the recited function of "transporting said ... reader and said [LDU] around a container terminal storage area." The '802 Patent makes clear that the unloading area at a wharf is not a "storage area." This Court has previously construed "storage area" as requiring distinct repository addresses for containers, and nothing in the '802 Patent suggests that this includes the wharf where containers are unloaded from a boat. Indeed, according to the ' 802 Patent, a container is typically not placed in a storage yard until it has first been placed on a truck chassis and transported to a storage area. *See* '802 Patent at 1:34-42.

Similarly, a crane next to rail cars on harborside rail tracks is not a corresponding structure for the function recited above. Containers that are being transported on rail cars are, by definition, not being kept in a container storage area; they are in transit. Thus, such a crane is incapable of performing the function of traversing the storage area. Straddle carrier cranes, in contrast, are mobile and may qualify as structure for the "means for transporting" if they are capable of maneuvering around such a storage area and are in fact "transporters". However, without more information from the parties, the Court does not make such a determination at this time.

Thus, the corresponding structure for this MPF limitation is: " *a transporter such as a cart, storage yard patrol truck, or mobile rover unit*."

g. "means for transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to ... said container terminal management system ..."

i. function

As with a number of other terms in the '802 Patent, the parties agree with most, but not all, of the function for this s. 112, para. 6 claim term limitation. They agree that it should at least include, "transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to a central processing computer of said container terminal management system." APS would add a further restriction found in the language of claim 1: "for verification from said database thereof whether said container is deposited at the proper address and updating said database."

The Court agrees with Paceco that APS's additional phrase only states a "desired result" of the actual function, namely, transmitting the combined identification and address signals for a given container. As

Paceco correctly observes, the '802 Patent clearly distinguishes the step of *transmitting* the recited signals to the CTMS, which is performed by the claimed system in the ' 802 Patent, and the separate step in which the CTMS *receives* the data. *See* Def.'s Response Br. at 15 (citing 8:28-33 for the proposition that "[t]he [CTMS] modem receives the data transmitted by the mobile unit and the software allows the new data to update the existing CTMS database"). The CTMS verifies and updates its inventory database entry for a particular container *after* receiving the data from the claimed invention. Precisely because "the mobile system [claimed by the '802 patent] ... is in communication with the CTMS, but does not include the CTMS," Def.'s Response Br. at 14, verification and updating are not properly part of the function. While they are obviously part of the intended result, verification and updating are not "critical to the purpose and operation of the alleged invention," Pl.'s Response Br. at 15, because what the CTMS does with the combined identification/address signal data after receiving it from the system claimed by the '802 invention is beyond that system's control. Figures 1 and 2 further reinforce this understanding. FN22

FN22. The two drawings of the '802 Patent illustrate the wireless transmission from the transporter (in Figure 1) and the CTMS (in Figure 2) by a circled letter "A." The steps of verification and updating, represented by a box labeled "container tracking result & data correction" in Figure 2, occur only after the combined signal has been received by a CTMS central computer, labeled 47.

Accordingly, the function is, " *transmitting said first and second combined* identification and address electronic signals specific to said container bein *interrogated to a central processing computer of said container terminal management system*."

ii. structure

Despite differences in wording, the parties essentially agree on the basic structures that perform the claimed function. First, in its simplest form, the corresponding structure can be a floppy disk or other movable storage unit, which can be transferred from the claimed system using a CPU and a floppy disk drive (or other movable storage reader). *See* '802 Patent at 6:62-65. Second, more practically, the data can be transmitted wirelessly to the CTMS by a wireless modem or communication unit. *See id*. at 6:66-7:6. APS argues that the CTMS must be part of each structure of this MPF claim term because it carries out verification and updating functions. As explained above, this is improper because verification and updating the database are *not* part of the claimed function.

Paceco also suggests that "an antenna" should be a corresponding structure. Both Figures 1 and 2 demonstrate an embodiment of the system that has an antenna *connected* to a wireless modem, and not as an independent transmitting structure.FN23 Thus, an antenna is at best part of other structures that the parties have already agreed upon. The specification does not make any other reference to antennas, nor is it clear how an antenna, by itself, could perform this function unless it is part of a wireless modem or other communication unit.

FN23. Defendant's expert Roman helpfully explains that the symbol of two adjacent triangles, forming a three pronged fork, represents a "standard electronic symbol for antennae." Roman Decl. at 31. However, the Court does not rely on his opinion that "one of ordinary skill of the art would understand that at least an antenna would be a means for wirelessly transmitting electronic signals," *id*.

The Court correspondingly defines the structure for this MPF limitation as: " *a wireless modem; a CPU and a transportable data storage reader such as a floppy drive, along with a transportable data storage unit such as a floppy disk; or a communications unit*."

h. "means for integrating said first and second electronic signals"

The parties agree that the function for this means-plus-function term should be construed as "integrating said first and second electronic signals." They also agree that the structure to carry out this function is a computer. *See* Def.'s Opening Br. at 20. However, APS argues that the computer must be onboard the transporter, because that is the only structure disclosed in the specification that performs this integrating function.FN24 *See* '802 Patent at 7:13-14 (explaining, in the embodiment of the invention represented in Figure 1, that "[b]oth signals are sent to the onboard computer 17"). Paceco counters that such a limitation on the corresponding structure is tantamount to redrafting the "means for transporting" term so that it must transport not only the identification means reader and means for generating a second electronic signal, but the "means for integrating" too. Pl.'s Response Br. at 16. FN25 Paceco also suggests that limiting where the "computer" structure can be placed (i.e. on board the transporter) may be improper in means-plus-function analysis.FN26

FN24. APS also notes repeatedly that the examiner identified the "means for integrating" as being an onboard computer. *See* '802 Patent prosecution history, Notice of Allowance, Examiner's Amendment (referring to a "means (17) for integrating the first and second signals," where 17 represents a computer aboard the transporter in Figure 1). An offhand reference in the examiner's largely boilerplate reasons for allowance does not invoke the doctrine of prosecution disclaimer. *See* Salazar, 414 F.3d at 1344-1347 (unilateral statements by examiner do not amount to a clear disavowal of claim scope by the applicant.)

FN25. It is unclear why such an interpretation of the claim should be considered a revision at all. After all, the "means for transmitting" or "means for wirelessly transmitting" is not explicitly limited to being onboard the transporter, but in all likelihood that is where it must be placed.

FN26. Paceco cites BBA Nonwovens Simposville v. Superior Nonwovens, 303 F.3d 1332, 1344 (Fed.Cir.2002), asserting that structure of a MPF claim term and its location are "two different things." The significance of that case is unclear. Paceco's apparent argument is that determining a structure's location during the process of defining the corresponding structure in a means-plus-function claim term is not proper. But here, it is clear that location and structure are not so easily separated from each other. For example, a small computer onboard the transporter will likely differ both qualitatively (in size and processing power, for example) as well as in location from one located elsewhere, such as a large dedicated computer facility.

But Paceco's arguments are misplaced. True, the claim language does not limit the corresponding structure to a computer aboard the transporter. However, the logic of the '802 invention demands it. The first and second electronic signals are transmitted to the CTMS by a "means for transmitting said first and second *combined* identification and address signals specific to said container being integrated." *See* '802 Patent, Cl. 1 (emphasis added). Clearly, the first and second signals must be combined before they are transmitted to the CTMS. And the most logical place for this "means for transmitting" is onboard the transporter. *See* '802

Patent, Fig. 1 (depicting wireless modem and antenna onboard the transporter). Thus, because the signal needs to be "integrated" before it is transmitted to the CTMS, the corresponding structure for integration must also be located onboard the transporter.FN27 As the parties agree, the CTMS computer cannot be a corresponding structure here, because its job is to receive the first and second signals after they have been integrated. *See* id. at 6:20-24.

FN27. Integrating off the transporter before transmission to the CTMS would be far more trouble than it is worth. Because the transporter is, by definition, mobile and capable of moving around a container storage area, it cannot be connected by wires to a separate integrating device. Thus, the two non-integrated signals would have to be transferred wirelessly (or even more impractically, by floppy disk) to a separate device which would perform the integration. The integrated signal would then have to be sent from there back to the "means for transmitting"-which may very well be a wireless modem back onboard the transporter-for transmission to the CTMS. Given that "integrating" the two signals appears to a very simple operation, there is no reason to do this.

Accordingly, the Court construes the structure as " *a computer onboard the transporter*."

i. "means for wirelessly transmitting said first and second combined ID and address electronic signals of said container to a central processing computer of said container terminal management system ..."

i. function

This term from Claim 6 is nearly identical to the term "means for transmitting" which appears in Claim 1, except for the word "wirelessly." As with "means for transmitting," the parties agree that the function here includes the phrase, "wirelessly transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to a central processing computer of said container terminal management system." APS would append "for verification from said database ..." to the function. As explained earlier, this phrase merely states a desired result and is not properly part of the function of this means-plus-function limitation. Thus, the function is " *wirelessly transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to a central processing computer of said container terminal management system*."

ii. structure

Again, the parties disagree over whether a CTMS should be part of the corresponding structure. Following the reasoning from above, the Court decides that the CTMS is not part of the disclosed structure.

Strangely, Paceco asks for virtually the same corresponding structures for this term as it did for the "means for transmitting." However, to allow all the structures for which Paceco asks, including a CPU with floppy disk drive, would render the "means for transmitting" and "means for wirelessly transmitting" terms completely identical in both function and structure (save for the word "wirelessly" in the function). Common sense dictates that the language of one claim should not ordinarily be interpreted so as to render another claim, narrower than the first claim, identical in scope. CHISUM ON PATENTS s. 18.03 [6]. Here, "means for wirelessly transmitting" contains an additional limitation in function, "wirelessly," not contained in the term "means for transmitting." The ordinary meaning of "wireless" is "pertaining to any of various devices that are operated or actuated by electromagnetic waves." RANDOM HOUSE COLLEGE DICTIONARY, REVISED EDITION (1980). This is consistent with a wireless modem or other communications unit. While

transferring a combined electronic signal via a floppy disk might technically be considered "wireless" in the sense that it is done without wires, such a meaning is not within the plain meaning of that term. Accordingly, the Court construes the structure as " *a wireless modem or a communications unit*."

The final three terms are from the "1 Patent**.**

j. "container inventory management system," or "CIMS"

"CIMS" appears widely throughout the claims of the "1 Patent. As described earlier, a CIMS is a system that can be integrated with a CTMS, but may also be a separate computer system. *See* "1 Patent at 4:60-62. A CIMS manages inventory by keeping track of both an optical characteristic of a container code and a positional identification for a given container.

Paceco argues against the restrictive definition for "CIMS" proposed by APS (which mirrors the wording APS proposed for "CTMS" if one replaces "container ID" with "optical characteristic" and "address" with "positional identification.") Paceco asserts that explicit language in the specification prevents APS from limiting "CIMS" to any embodiment found in the invention. *See* "1 Patent at 8:54-59 ("Note that the [CIMS] 1000 is not limited to the following discussion...."). But while APS's definition is indeed too restrictive, the Court also finds that Paceco's proposed definition, "processing system for managing information related to an inventory of containers," is too vague.

At the very least, the CIMS must be capable of receiving and processing both optical characteristic codes and positional identifications. *See* "1 Patent at 7:30-37, 14:25-28. Furthermore, the CIMS must manage and update at least a container inventory database. *See id*. at 6:35-38, 7:38-43. However, APS's proposed limitation that the CIMS have a "central processing computer" is unnecessary. Paceco correctly observes that the "1 Patent discloses multiple configurations for a CIMS, including one "where the memory and database reside [on] more than one network computer, rather than on a single central processing computer". Def.'s Response Br. at 17-18 (citing "1 Patent, Figure 4A).

The Court otherwise follows the general logic of its analysis for the "CTMS" claim term from the '802 Patent. Accordingly, it defines a "CIMS" as " *a processing system that tracks inventory of containers by managing at least a database of optical characteristics of container codes and positional identifications of containers*."

k. "positional identification"

The parties disagree about the type of information that may be a "positional identification." Paceco proposes to construe the term as "information for identifying location," a definition which essentially imposes no limitations on the kinds of information that can be used to identify a container's position. APS, on the other hand, defines the term narrowly as "an indication of global position obtained by tracking current location within a terminal container shipping yard." Both parties' constructions of the term are unsatisfactory to the Court.

First, the Court finds that APS's proposed definition is not supported. It is unclear what, besides perhaps a GPS reading, qualifies as an indication of " *global* position anywhere within the terminal," Pl.'s Op. Br. at 23 (emphasis added). As Paceco notes, limiting the term in this way appears to exclude forms of positional identification such as locking indication or hoist position, which are arguably "local," not "global" forms of position. APS's proposed construction is flawed because it excludes these forms of position that are

adequately disclosed in the specification.

Paceco proposes a much broader construction, arguing that the doctrine of claim differentiation FN28 requires that positional identification encompass more than the three examples described in the ' 931 Patent, i.e. (1) the "loading-operation designation" (relating to a container's position while it is being lifted by a crane); (2) the "terminal location" (indicating the position of the crane in the terminal); and (3) the "storage-location designation" (indicating a container's repository address in a storage area). FN29 *See* id. at 8:34-38, 10:46-47, 13:63-64. However, the claims in the ' 931 Patent cannot support a broader definition of "positional identification" than the specification discloses.FN30

FN28. "Claim differentiation" is the general principle that a broad claim should not contain limitations expressed in a narrower one (specifically, where the narrower claim depends from the broad claim). *See* CHISUM ON PATENTS s. 18.03[6]; Stevenson v. Intern. Trade Comm'n, 612 F.2d 546, 554 (CCPA 1979).

FN29. Paceco contrasts independent claim 43, which references "generating the positional identification of the container," without further restrictions, with claim 47, which depends from claim 43 and "further" defines "positional identification" in terms of loading-operation, storage-location, and terminal location. Thus, Paceco asserts, "positional identification" as it is used in claim 43 must be a broader term that encompasses more than just the loading-operation, storage-location, and terminal-location designations. *See also* "1 Patent at 10:46-50 (stating that "[p]ositional identification **3260** *may further include* at least one of the following" and then reciting the three mentioned designations) (emphasis added).

FN30. Claim differentiation is not a "hard and fast rule" of construction; it only creates a presumption that each claim in a patent has a different scope. Bristol-Myers Squibb Co. v. Ben Venue Labs, Inc., 246 F.3d 1368, 1376 (Fed.Cir.2002). It does not allow "unrestrained expansion of claims beyond the description of the invention in the specification" or the prosecution history. Tandon Corp. v. U.S. Intern. Trade Comm'n, 831 F.2d 1017 (Fed.Cir.1987).

The "1 Patent discloses a wide variety of means for generating the positional identification, including a crane PLC interface, crane relay controls, a GPS system, laser, infrared, or ultrasonic sensors, and a gray-coded hoist shaft. *See* "1 Patent at 9:18-25, 13:48-56. Paceco argues that these various sensors and instruments should be considered forms of positional identification. However, the Court does not adopt such a broad interpretation. The sensors and instruments mentioned above are uniformly disclosed for one of two purposes: determining the hoist and trolley position or determining the container locking indication. In particular, the specification teaches that the crane PLC interface or a relay network are used to determine the hoist position. *See id*. at 12:11-18, Fig. 11A. It also indicates that a coded hoist shaft, ultrasonic transponders, lasers, infrared sensors, and possibly a PLC interface signal can be used to determine the locking indication. *Id*. at 9:23-25, 12:21-30, 13:48-57, Fig. 11B. This makes sense because the primary data received from these sensors is not useful in itself as "positional information." FN31 Clearly, it is the position of the hoist and the container locking indication that matter.

FN31. The written description states that the trigger for the OCR camera mounted on the quay crane is "preferably based on at least the loading/unloading conditions on the container crane." These loading/unloading conditions are preferably measured by the instruments and sensors listed above. However,

using these measurements for the purpose of knowing when to trigger the OCR camera is distinct from using them for purposes of "positional identification" that is sent to a CIMS.

Furthermore, GPS in the "1 Patent is only disclosed as having two main purposes: (i) creating in part a terminal-location designation, *see* id. at 11:25-29, Fig. 8C, and Cl. 5; and (ii) determining a Z axis location for a crane as part of determining a storage-location designation. *See* id. at 13:63-67, 14:36-38, Fig. 8C. The "1 Patent does not appear to disclose the use of GPS for other purposes.FN32 In fact, the use of GPS to determine a Z axis position is *discouraged* with a quay crane, as opposed to a transfer container crane, due to the quay crane's lower "accuracy requirements." Id. at 14:6-9.

FN32. The patent does state that the terminal designation can be used to derive in part a storage-location designation or loading-operation designation. "1 Patent at 8:39-42. However, GPS is not mentioned as a tool for measuring positional identification outside of these three categories.

Given that both parties' suggestions have not been helpful, the Court finds it difficult to craft a single definition that provides meaningful limitations on "positional identification" while encompassing all the embodiments disclosed by the "1 Patent. Figures 6C and 8A seem to suggest that loading-operation designation, terminal location, and storage-location designation are the three most *significant* forms of "positional identification." FN33 Thus, this Court defines "positional identification" as " *information for identifying location that consists of one or more of the following: hoist-trolley position, container locking indication, loading-operation designation, storage-location designation, and terminal location*."

FN33. Figure 6C consists of an outer box labeled "positional identification 3260" that encircles three inner boxes that correspond to the three loading-operation, storage-location and terminal-location designations; those three inner boxes occupy most of the space in the larger box. Similarly, Figure 8A represents a flowchart for the operation of generating positional identification, *see* "1 Patent at 11:5-7, which depicts three separate paths corresponding to operations that generate the loading-operation, storage-location, and terminal-location indications. There are no other paths in the flowchart. *Id*. at 11:3-4 (stating that the invention "may also include" one or more of the operations of Fig. 8A).

1. "loading-operation designation"

The "loading-operation designation" is a form of positional identification that describes the position of a container while it is being lifted by a crane (e.g., during unloading by a quay crane from a boat to the shore, or vice versa.) It appears in claims 1, 7, 17, 24, 35, 36, 47, 48, and 57. However, it is not defined in the specification and the term does not seem to have an ordinary meaning. *See* Pl.'s Op. Br. at 23. The parties dispute whether a "loading-operation designation" must by definition include an indication of *both* locking status (i.e. whether a container is attached to the crane) *and* hoist position, or whether either indication by itself is sufficient.

The written description clearly explains that at least one, but not both, of locking status and hoist position are necessary to generate a "loading-operation designation." *See* "1 Patent at 12:35-38. Figures 11A, 11B, and 11C, representing three distinct flowcharts for the process step of generating the loading-operation, confirm this interpretation. The first two figures indicate that a locking indication by itself, "1 Patent, Fig.

11A, or a container hoist position by itself, id., Fig. 11B, are sufficient for a loading-operation designation. (Fig. 11C emphasizes the same point in a single diagram block.) However, APS points to the convoluted language of Claim 1 in support of its argument that both elements are required in every case. FN34 Essentially, it argues that because Claim 1 (as well as every other one of the claims that mentions either locking status or hoist position) is worded in a way that invariably requires the loading-operation to be comprised of both those elements, the term "loading-operation" should be construed to always require both locking status and hoist position.

FN34. Claim 1 states, in relevant part (emphasis and lettering added):

[A] wherein the program step generating said **loading-operation** is *further* comprised of at least one member of the collection comprising the program steps of:
[two ways to determine the **locking** indication];

[B] wherein the program step generating said loading-operation is *further* comprised of at least one member of the collection comprising the program steps of:
[two ways to determine the **hoist** position];

[C] wherein the program step generating said loading-operation is *further* comprised of the program step of: generating said loading-operation designation based upon at least one member of the collection comprising said **locking signal** indication and said container **hoist** position.

Paceco's half-hearted arguments to the contrary, having at least two of the three phrases [A]-[C] is sufficient to guarantee that both locking signal and hoist position will be needed to describe a loading-operation designation.
APS's reliance on the peculiar structure of the claims of the "1 patent is unwarranted. Clearly, if *every* claim involving the loading-operation designation required both indications of locking status and hoist position, then it would be redundant to require that as a limitation of the "loading-operation" term itself. Even though that is not the case,FN35 APS seeks to import the limitation on the narrower "loading-operation" claims (i.e. those that mention locking status or hoist position) onto the broader ones. Not only is this bad claim construction practice, but the specification as discussed above will not support such an interpretation.

FN35. Besides claim 1, claims 7, 17, 24, 48, and 57 all have at least two of the three "further comprised of" phrases cited in claim 1, and thus require that the loading-operation designation be comprised of both the locking indication and the hoist position. Claims 35 and 47, however, reference loading-operation designation without mentioning either locking or hoist position, and thus do not possess that limitation.

Accordingly, the Court defines this term as " *information regarding either the locking status, or the hoist position, or both, of a quay crane*."

V.

CONCLUSION

To summarize, the Court defines the terms of the '802 Patent as follows:

1. A "computer terminal management system" is " *a processing system comprising one or more computers for managing information related to containers in one or more container terminal storage areas, in which the system manages at least a database of container ID codes and of addresses of containers in those storage areas*."

2. A "transporter" is " *a mobile unit that can traverse a container terminal storage area in a manner so as to allow a container ID means reader and a LDU carried onboard the transporter to remotely interrogate individual containers*."

3. A "storage area" is " *an area for storing cargo containers within a terminal that has distinct repository addresses for storing the containers*."

4. "Address" means " *information for identifying the location of a cargo container in a container terminal storage area*."

5. "Means for generating a second electronic signal ..." is a means-plus-function term pursuant to 35 U.S.C. s. 112, para. 6. The function is " *generating a second electronic signal which identifies any particular repository address in said storage area and which can be processed by said container terminal management system*." The structure corresponding to that function is " *a location determining unit (LDU), such as a radiometer, an electronic magnometer, a radio transmitter/receiver, an optical character reader, or a global positioning system (GPS) receiver*."

6. "Means for transporting said identification means reader and said means for generating a second electronic signal together ..." is a means-plus-function term. The function is " *transporting said identification means reader and said means for generating a second electronic signal together and traversing a container terminal storage area in a manner that allows them to remotely interrogate individual containers*." The corresponding structure is "a *transporter such as a cart, storage yard patrol truck, or mobile rover unit*."

7. "Means for transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to ... said container terminal management system ..." is a means-plus-function term. The function is " *transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to a central processing computer of said container terminal management system*." The corresponding structure is " *a wireless modem; a CPU and a transportable data storage reader such as a floppy drive, along with a transportable data storage unit such as a floppy disk; or a communications unit*."

8. "Means for integrating said first and second electronic signals" is a means-plus-function term. The parties agree that its function is "integrating said first and second electronic signals." The corresponding structure is "a *computer onboard the transporter*."

9. "Means for wirelessly transmitting ..." is a means-plus-function term. Its function is " *wirelessly transmitting said first and second combined identification and address electronic signals specific to said container being interrogated to a central processing computer of said container terminal management system*." The corresponding structures are " *a wireless modem; a CPU and a transportable data storage*

reader such as a floppy drive, along with a transportable data storage unit such as a floppy disk; or a communications unit."

The Court defines the requested terms of the "1 Patent as follows:

1. A "container inventory management system" is " *a processing system that tracks inventory of containers by managing at least a database of optical characteristics of container codes and positional identifications of containers*."

2. "Positional identification" is " *information for identifying location that consists of one or more of the following: hoist-trolley position, container locking indication, loading-operation designation, storage-location designation, and terminal location*."

3. "Loading-operation designation" is " *information regarding either the locking status, or the hoist position, or both, of a quay crane*."

IT IS SO ORDERED.

C.D.Cal.,2007.
APS Technology Group, Inc. v. Paceco Corp.