# MCI Media – Savannah GA 2023

SYSTEM OVERVIEW Not MEANT TO BE A PORT SPECTIFIC SOLUTION-DISCUSSION PURPOSES ONLY!



Container High Density Tower Matrix Port Solution Presented by: Richard Lydle, Patent Holder

#### CONTAINER LOGISTICS INTERNATIONAL Robotic Port Container Processing Systems

#### Richard Lydle and Colonel J. Michael Miller - Presenters

r.lydle@containerlogisticsinternational.com

Office: 011 954 657 9272 Mobile: 011-239-877-8689 2436 N. Federal Highway, # 400, Lighthouse Point, Florida 33064

### **CLI Tower Matrix** Container Port Automation

Port Disruptive High Bay Storage Systems Technology Lydle Trust Patents Issued July 5, 2022



			US011377313B2	
(12)	Unite Lydle	d States Patent	(10) Patent No.: US 11,377,313 B2 (45) Date of Patent: Jul. 5, 2022	
(54)	SHIPPING CONTAINER HANDLING SYSTEMS AND METHODS		(58) Field of Classification Search CPC B65G 63/004; B65G 63/065; B65G 63/002;	
(71)	Applicant:	THE RICHARD C. LYDLE REVOCABLE TRUST, Lighthouse Point, FL (US)	B65G 63/006; B65G 67/603; B65G 2201/0235; B65G 1/0407; B66F 9/06 See application file for complete search history.	
(72)	Inventor:	Richard C. Lydle, Lighthouse Pointe,	(56) References Cited	
		FL (US)	U.S. PATENT DOCUMENTS	
73)	Assignce:	THE RICHARD C. LYDLE REVOCABLE TRUST, Lighthouse Pointe, FL (US)	3.559.822 A * 2/1971 Lichtenford	
*)	Notice:	Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.	s 4.023.687 A 5/1977 Salloum 5 5,310,066 A 5/1994 Konstant (Continued)	
21)	Appl. No.:	16/622.517	FOREIGN PATENT DOCUMENTS	
22)	PCT Filed	Jun. 14, 2017	WO 2012123956 9/2012	
86)	PCT No.:	PCT/US2017/037488	OTHER PUBLICATIONS	
	§ 371 (c)( (2) Date:	). Dec. 13, 2019	United States Patent and Trademark Office, International Search Report/Written Opinion, International Application No. PCT/US17/ 27498 dated See 2012 1	
87)	PCT Pub.	No.: WO2018/231222	strong dates step. 1, 2011, 10 piges, Mickandria, VA U.S.A.	
	PCT Pub. Date: Dec. 20, 2018		Primary Examiner Kaitlin S Joerger	
65)	Prior Publication Data		(74) Attorney, Agent, or Firm — Hahn Loeser + Parks LLP: Scott M. Oldham	
	US 2020/0	207557 A1 Jul. 2, 2020		
51)	Int. Cl.		(57) ABSTRACT	
	B65G 63/	0 (2006.01)	There is provided shipping container handling systems and methods that maximize the number of containers that can be	
	B66F 9/00	(2006.01)	stored on a predetermined property, as well as increasing the	
	B66C 19/00 (2006.01)		efficiency of the transfer of containers between transship-	
(52)	U.S. CL CPC B65G 63/004 (2013.01): B65G 67/603		systems and the like.	
	(2013.01); B66F 9/06 (2013.01); B65G			
	220	70235 (2013.01); B66C 197002 (2013.01	21 Claims, 10 Drawing Sheets	
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	26	19 10		
			<u> </u>	

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# **PACECO CORP.** /Mitsui STS Cranes

All Types and Sizes to meet all Terminal Requirements-Worldwide Stature and US Parts Source in CA.



PACECO GROUP

// Crane Management System Easy Maintenance

#### PACECO-Mitsui Benefits: Optional Dual Trolley for Pin Removal Stations

1. "Monobox" boom crane design - reduces weight around 10%

2. The lower weight allows additional features added to the crane while maintaining wheel loads (i.e., hatch cover platform, twistlock/pinning station)

3. Self-propelled trolley with individually driven wheels to prevent slipping

4. Spacious machinery house for easy maintenance due to elimination of trolley drum

5 Reliable crane – proven lower breakdown ratio for high uptime in production and savings in total cost of ownership over time

6 If automated cranes, ABB and Rockwell drives are options. Standard drives are Fuji Electric with PACECO-Mitsui integration.

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STS drawings are representative and either single or double trolley cranes can be selected as required 3 by each port application

### How **CLI Tower Matrix**

Steps of The Process within Tower System <u>A Shelf For Every Box and Every Box in its Shelf!</u>

### "Ingenious and Precision Motion"

CONTAINER LOGISTICS INTERNATIONAL HBS ("Buy America")

STS Unload/Load by Paseco Corp (Mitsui Japan)

VDL AGV Quay to Linev 100% NII and Nuclear Detection Stations (CBP control)

STS or Ground Located Robotic Twist Lock/Pinning Removal Station

VDL AGV to CLI Stacker System Staging

Refers on ground level or within refer storage racks manually electrified (Optional)

Boxes to High Bay Storage (HBS) Racks, 20 foot and 40/45 foot to unique sized rack

Refrigerated Boxes on Ground Level Easy and Quick Human Hook Up Interface and Tracking

Boxes and be pre sorted to transshipment HBS Racks (TOS and CLI System)

Operations : Remote Controlled or Local Control Rooms (Optional),

CBP released or quarantines Boxes TOS controls movement

Land Side Exit by Automated Shuttle, Transfer ARMG to Truck, Railhead or Manual Inspection (per CBP Configuration/Re Configuration) (Land Side Truck, Bomb or Straddle carriers to rail head OCR/RFID Verification

Automated Truck Cue by TOS Stations

Area Security CCTV with Laser Sensors of Rack Areas (optional)

# Stacker Crane - High Bay Storage CLI Does 14 Levels Of Boxes (HBS)



#### CONTAINER LOGISTICS INTERNATIONAL Robotic Port Container Processing Systems

### Compare: Container Logistics International Robotic Port Container Processing Systems

#### CLI Tower Matrix System-14+ Tiers

**No Box Shuffling** – Saves TIME, Lowest Cycle Times within Port-Lowest Cost (OPEX)

**NO "Underground Transfers"**-Faster Cycle, Lower Construction Cost (CPEX)

**Rockwell Automation** provides 50 + years of proven warehousing system technology.

A Complete System -Quay to the "World"-Shortened Port Dwell Times

Full Remote Controlling is Feasible

Density at Port = 1200 to 1400 TEU Boxes per Acre (80/20 ratio 40'/20')(3300 TEU/Hectare).

Truck Interface - Safety, Flexibility, Automated Truck Exchange Zone, OCR to assure correct box to chassis correctness CBP Protocol Ready for your Terminal! Seismic Consideration is Included

### **Traditional Port Technologies**

**Box Shuffling** – Takes Cycle time (automated stacking or not) 40% to 52% of direct time and labor costs to shuffle. Automated or Manual!

### "Traditional Cube"/TEU/acre density

DENSITY	TYPE	COMMENT	
VERY LOW DENSITY 80 TEU/acre	Ro/Ro or Ship's Gear Wheeled Combination Dedicated Wheeled	Very small, barge, specialized Small, mixed, legacy Older terminals when new	
LOW DENSITY	Wheeled/Top-pick	Transition terminals	
80 TEU/acre	Top-pick/Wheeled		
MID DENSITY	Straddle/Top-pick/Wheeled	"Hybrid" terminal	
100-200 TEU/acre	RTG/Top-pick/Wheeled	Dominant "hybrid" type	
HIGH DENSITY	Straddle Carrier	NIT Virginia, Maher NYNJ	
160-300 TEU/acre	RTG	No US example	
VERY HIGH DENSITY	PMC	APM Portsmouth	
360 TEU/acre	Kiilo		

Source: Tioga Group Presentation

Density 80 to 300 TEU's per acre.





### Buy America – Florida Based Engineering

**CLI Systems Hardware and Systems:** 

Rockwell Automation	Rockwell Automation, Milwaukee, WI
	Leidos, Vista CA – 100% NII or Linev, Texas
	VDL, AGV's, Netherlands
PACECO° CORP.	STS Cranes of Choice- fully Integrated by CLI
<b>FFRegal</b> Rexnord	Regal-Rexnord Power Trains & Conveyors- Milwaukee, WI
CONTAINER LOGISTICS INTERNATIONAL Redec For Container Processing Solaters	CLI, USA. Patent Owner, Florida
	Gantrex, PA, Rail and Power Supply Systems
<b>Ť</b>	Solar Powered by Tesla Energy
	All Electric-Sustainable and Intelligent
navis	<ul> <li>TOS Operations – Interfaces with all</li> </ul>
CISCO	Cisco Systems-Hardware-Security
portwise	Port Capacity Throughput & Simulation Analysis     (Formerly TB Consulting)

Customs and Border Patrol, CBP/OFO, support for Re-Configuration or Configuration protocols as needed by CBP.

Navis / TOS integration support between CLI and Terminal operator Terminals.

Long Term Maintenance Predictable Cost agreements are available with CLI and Rockwell Automation



#### Conceptual Terminal Design Configuration Sized @ 4000' by 1200' 61.34 Acres CLI Tower Cube, or 24.82 Hectares Tower Cube Racks Foot Print = 800' x 3,340'

As Drawn-80% 40/45 foot and 20% 20 foot boxes Capacity = 76104 TEU//Units





## Linev Systems NII, AGV Fleet and Twist Lock Robot Station

Leidos NII Full Box Scanner with Nuclear Detection VDL AGV will drive through Scanner for 100% inspection of ALL Containers (Miltiple Units on Deck for VDL) **Confidential per NDA** 











VDL AGV's Gantry to Leidos NII to CLI Tower Matrix Load/Unload

Option for Transfer Automation Straddle Carriers



Automated CLI Robotic Twist Lock System at STS

### STS Pinning or Twist Lock Robot Station Dual Trolley

Main STS Long Reach Spreader



Mezzanine 2<sup>nd</sup> Crane Runway to feed Pinning Station and Ground AGV's

**Mezzanine Pinning Station** 

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Confidential per NDA

Mezzanine, 2<sup>nd</sup> Crane

Transfers

Boxes to and from pinning

station and AGV's.

Mezzanine 2<sup>nd</sup> Crane Transfers Boxes to and from station.



Automated CLI Robotic Pinning System at STS Designed by CLI and Built in North Carolina



#### System General Arrangement of Equipment – Automated Tower Stacker Crane (ATSC) and Racks (HBS)



## System General Arrangement of Equipment Stacker Crane and Racks



#### System General Arrangement of Equipment Stacker Crane and Racks



### Automated RMG Rail Mounted Gantry Beyond End of Exit Racks



Exit End of Racks – Box is placed on Yellow Powered Cart or Automated Conveyor as it leaves the CLI Towers on the end Quay Side Rack connecting to STS Cranes inland Exit End to Last Mile Trucking, Rail all port options.







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### Exit Conveyor or Shuttle Car to Rail, Last Mile & other port options. Orientation can be as shown or rotated 90° for best Flow within Terminal Configuration.



### Proven and Reliable Operation Systems & Sustainable Equipment Create Value

• Port Benefits: Top Tier, Highest Throughput, Empties Solved, Fastest Ship Turnaround, Highest Owner ROI and Profits



### Combined Vendors Annual Revenue > 42 Billion



- Innovation Patented Technology filed in 2012, Patent issued 2022
- CLI's Engineering Focus Boat Storage and Port Logistics
- System know-how
- Motion-Tailoring and Flexibility
- Life-long support and services- offering fixed cost maintenance contracts with

24/7/365 system analysis



- Offices in USA, Canada and Europe
- Warehouse Motion Systems Simulation by Rockwell Automation



- Capacity and Throughput analysis prove by Simulation ensures optimal operation

that predict and avoid operation bottlenecks.



Industries ~

Capabilities ~

Rockwell Automation

Condition-based Monitoring for Commercial Vessels Reduce equipment downtime and optimize system performance. Reduce Equipment Downtime and Optimize Performance

Company ~

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To achieve efficient operation, you must keep your complex ship systems up and running - and safeguard your critical assess. From vibration monitoring of propulsion and maneuvering systems to all analysis of oliwetted machinery, our integrated condition monitoring solutions provide easy access to shipboard asset health information.

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### Capacity *Example* based on Concept Drawing



## **Benefits and Advantages**

### **Colonel J. Michael Miller- USMC - Presenting**

- Single Source Responsibility for all equipment and systems
- No Shuffling of Any Box to reach any needed box.
- Saves the time to move 420,000 boxes even in an Automated CUBE Stacking Crane Port Such as TraPac LA.
- Fast Ship Turns
- 200 to 300% Capacity to Store Loaded and EMPTY Boxes on Site-14+ Tiers
- Saving trucking, handling and retrieval of Empties from remote site storage.
- Predictable Operations
- Faster Last Mile Truck and Rail Exchanges (Truck in and out in under 20 minutes is attainable (Proven my Computer Modeling)
- Solar Powered and Power Regeneration Hoists, Control Visualization, stops Unproductive Moves.
- Fully Automated reducing Work Force by up to 78% over traditional terminals handling 2,000,000 TEU per year and labor savings is scalable.
- Available Firm Fixed Maintenance Contracts for Predictable OPEX
- Super Green
- AGV's all Electric
- Design your Terminal System YOUR WAY, More Unique Options for terminal Flow that ever before, Drive Through Truck for FAST transfers
- Proven Systems and Warehouse Technology proven in the Automotive and Automated Warehouse industries for over 60 years by Rockwell Automation
- Extensive Coordination of Trucking with GPS for Last Mile Truck pick up and drop off reliability without gate lines using remote GPS cuing
- Reefers without Human interaction with Automated System ... all within the protection of the rack system and on the ground level, no climbing or steps. Reefer out of direct sunlight.
- Low Noise Pollution from the system as ALL power is electric and engineered for QUIET OPERATIONS
- 100 % container weight verification before Quay contact

# Thank you for your attention and time to learn about

### **Container Tower Matrix Port Solution**

### **Questions Please**.

**CONTAINER LOGISTICS INTERNATIONAL** 

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Richard Lydle, President 2436 N. Federal Highway, # 400 Lighthouse Point, Florida 33064 www.containerlogisticsinternational.com r.lydle@containerlogisticsinternational.com 011 954 657 9272 Office President's Direct Desk Number 011 239 877 8689 Mobile