

**Señora Jefe
DIVISIÓN DE NUEVAS CREACIONES
SUPERINTENDENCIA DE INDUSTRIA Y
Bogotá, D.C.**

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 05-128100-00004-0000

Fecha: 2009-08-04 10:47:35 Dep. 2020 NUECREACIONE
Tra 11 PATENTEIYII Eje 379 FASENACIONALI
Act 593 IMPULSOPROCESAL Folios: 1

**Re.: Expediente No. 05 128.100
Fase Nacional Solicitud de Patente PCT
a nombre de
PEDRO ALVARES RIBEIRO DO CARMO PACHECO
Código 011- 379 - 593**

En relación con la solicitud contenida en el Expediente de la referencia y, en particular, con la publicación del extracto de la misma, por medio del presente escrito me permito manifestarle:

1. Con memorial radicado el día 14 de Junio de 2007, o sea, HACE DOS AÑOS solicité se sirviera proceder con el examen de patentabilidad de esta solicitud.
2. Con el citado escrito se acompañó el comprobante de pago de la tasa respectiva.
3. En razón del tiempo transcurrido, atentamente le solicito se sirva volver su atención sobre este caso y proceder con el examen de patentabilidad solicitado.

De Usted Atentamente,

GERMAN CASTILLO GRAU

T.P. No. 2.978 del C.S.J.

United States Patent [19]
Lee

US005154561A
[11] Patent Number: 5,154,561
[45] Date of Patent: Oct. 13, 1992

[54] AUTOMATED ALL-WEATHER CARGO
TRANSFER SYSTEM

[76] Inventor: Donald E. Lee, 2033 Parkview Ave.,
Abington, Pa. 19001

[21] Appl. No.: 508,234

[22] Filed: Apr. 11, 1990

[31] Int. Cl.⁵ B65G 67/62

[52] U.S. Cl. 414/138.3; 114/264;
405/219; 405/224; 414/138.1; 414/138.2;
414/139.6; 414/139.7; 414/139.8

[58] Field of Search 114/264, 265, 266, 267;
405/202, 204, 219, 224, DIG. 8; 414/137.9,
138.2, 138.5, 138.7, 138.8, 139.4, 139.6, 139.7,
139.8, 141.7, 138.1, 138.3; 901/47

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613950 7/1978 U.S.S.R. 414/138.2

Primary Examiner—Robert J. Spar
Assistant Examiner—Janice Krizek
Attorney, Agent, or Firm—Paul Maleson

[57] ABSTRACT

An advanced automated vessel cargo transfer system for loading and unloading of ships and lighters. It includes an articulated manipulator arm mounted on a frame. The arm is provided with a spreader bar at the distal end thereof. The spreader bar is provided with facilities for grasping cargo. Sensors track the movement of the vessel, and automatically responsive controllers adjust the motion and position of the spreader bar to follow the motion of the vessel. Berthing modules are provided to aid in controlling the motion of the vessel. In a major embodiment, the manipulator arm is mounted on a transverse frame that bridges spaced-apart floating barges, and provisions are made for serving vessels both on the outboard and inboard sides of the barges. In another embodiment, the manipulator arm is shore-based.

12 Claims, 27 Drawing Sheets

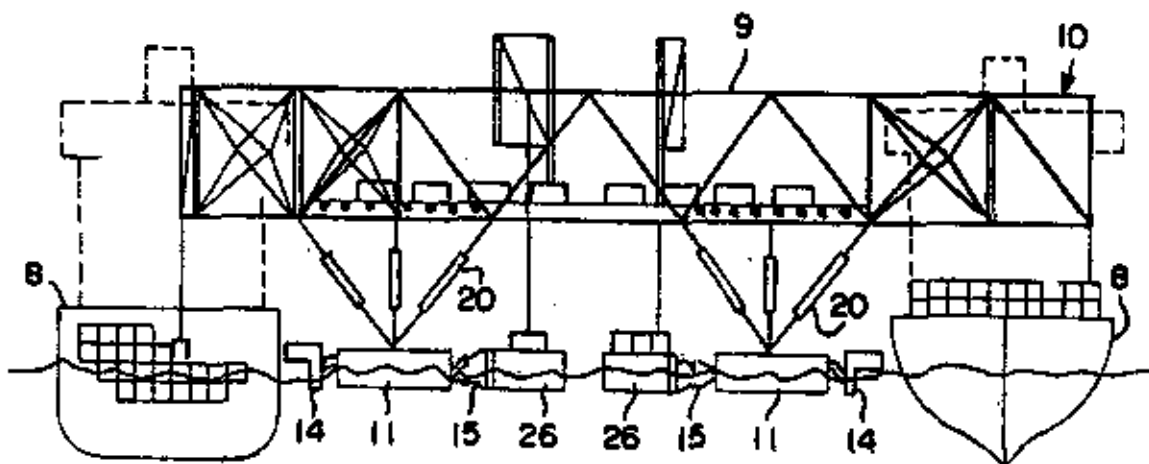
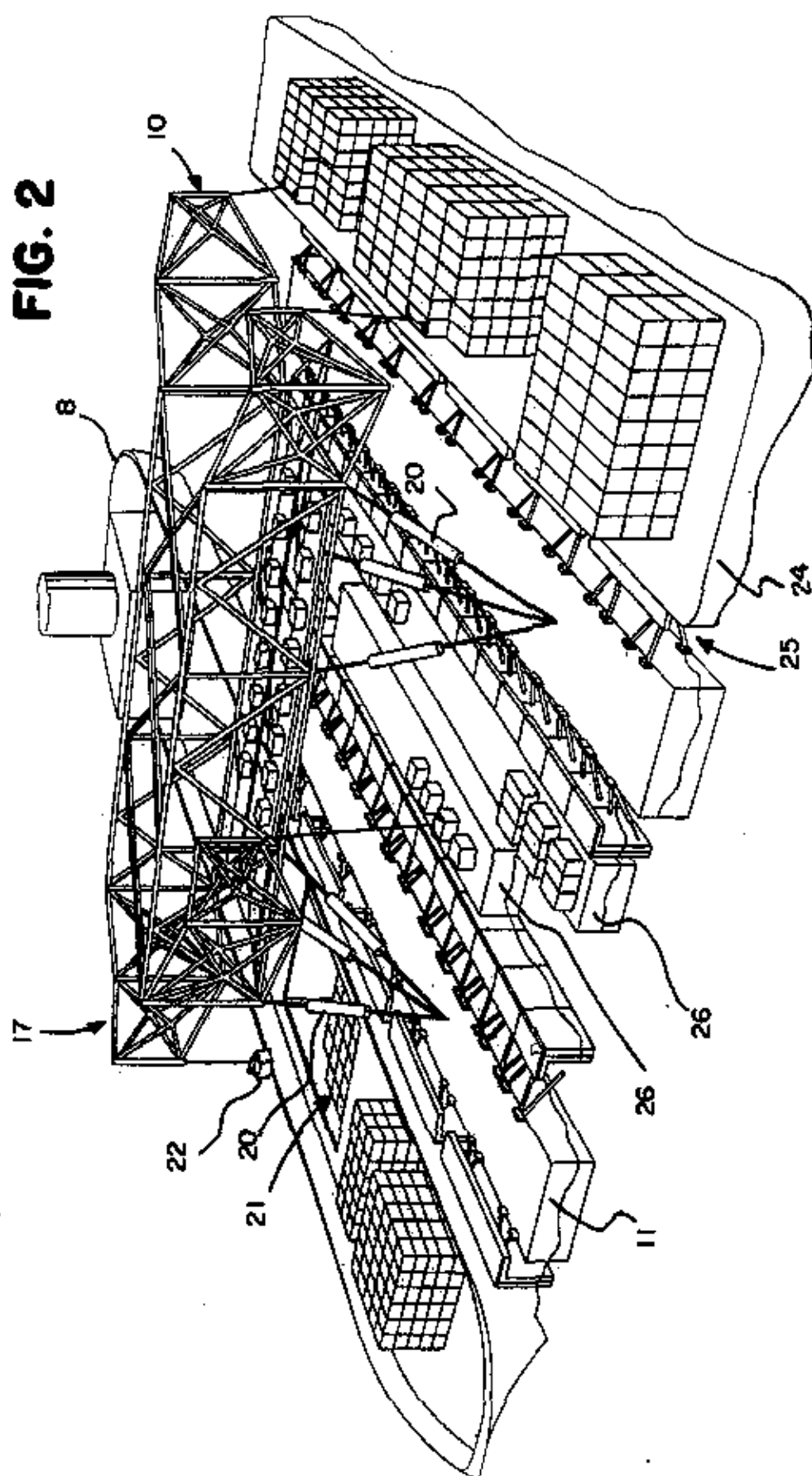
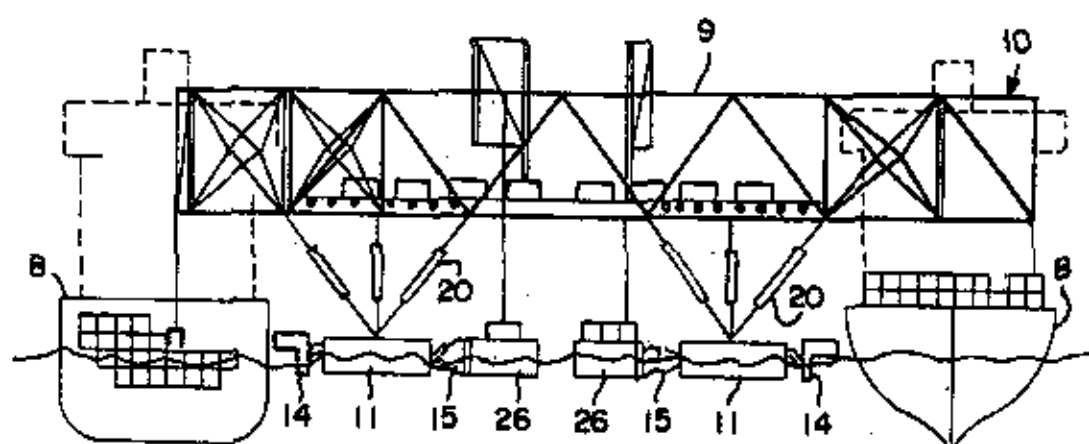
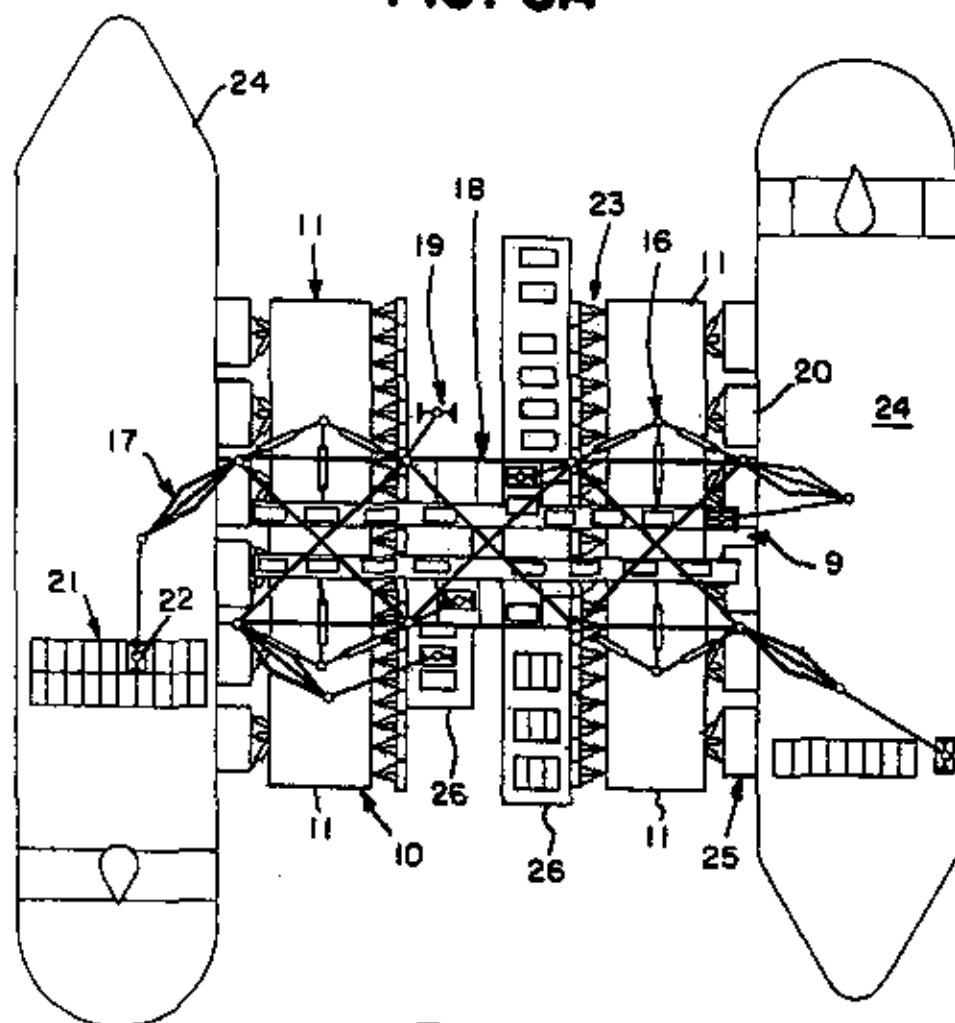


FIG. 2

**FIG. 3A****FIG. 3B**

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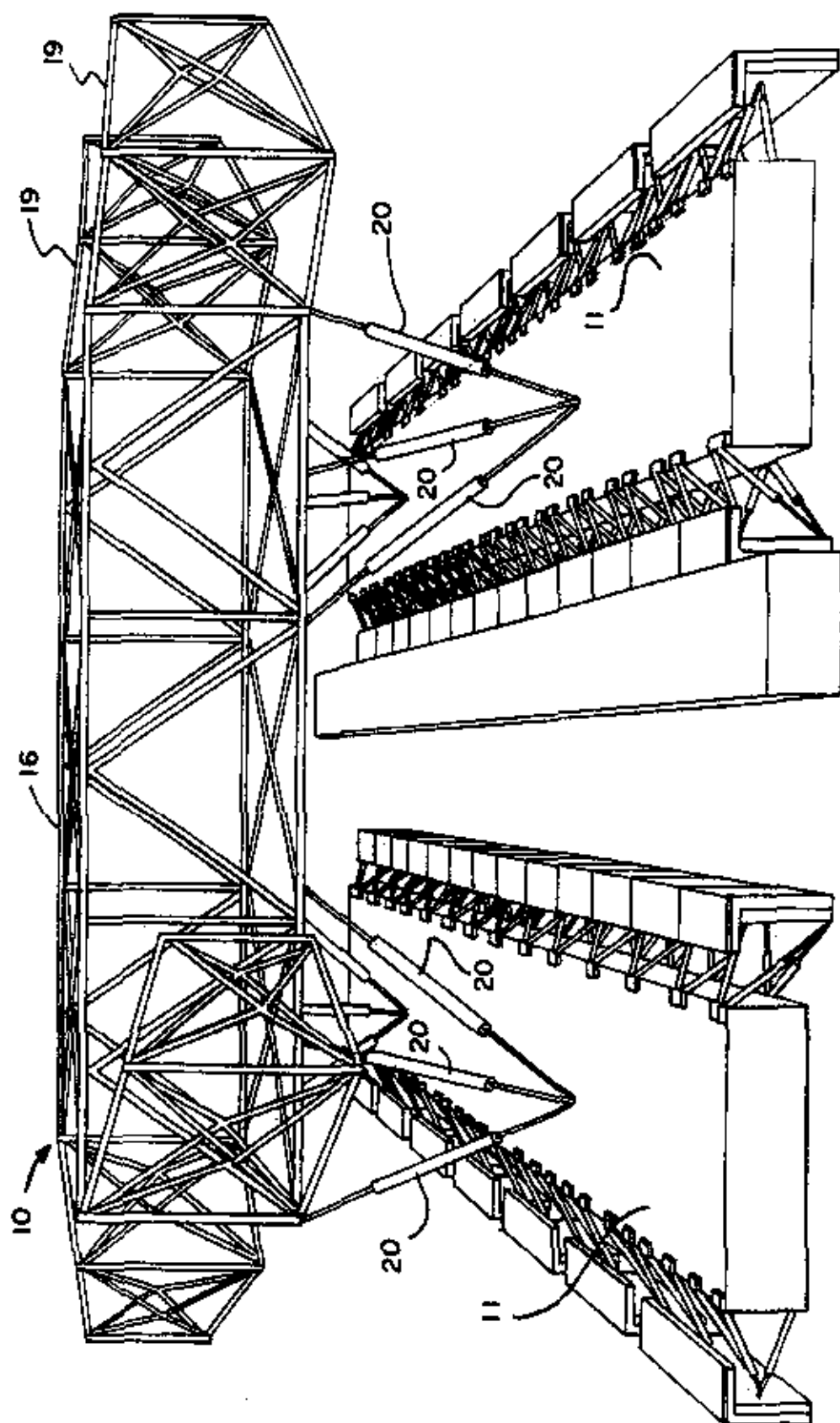


FIG. 4

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FIG. 5A

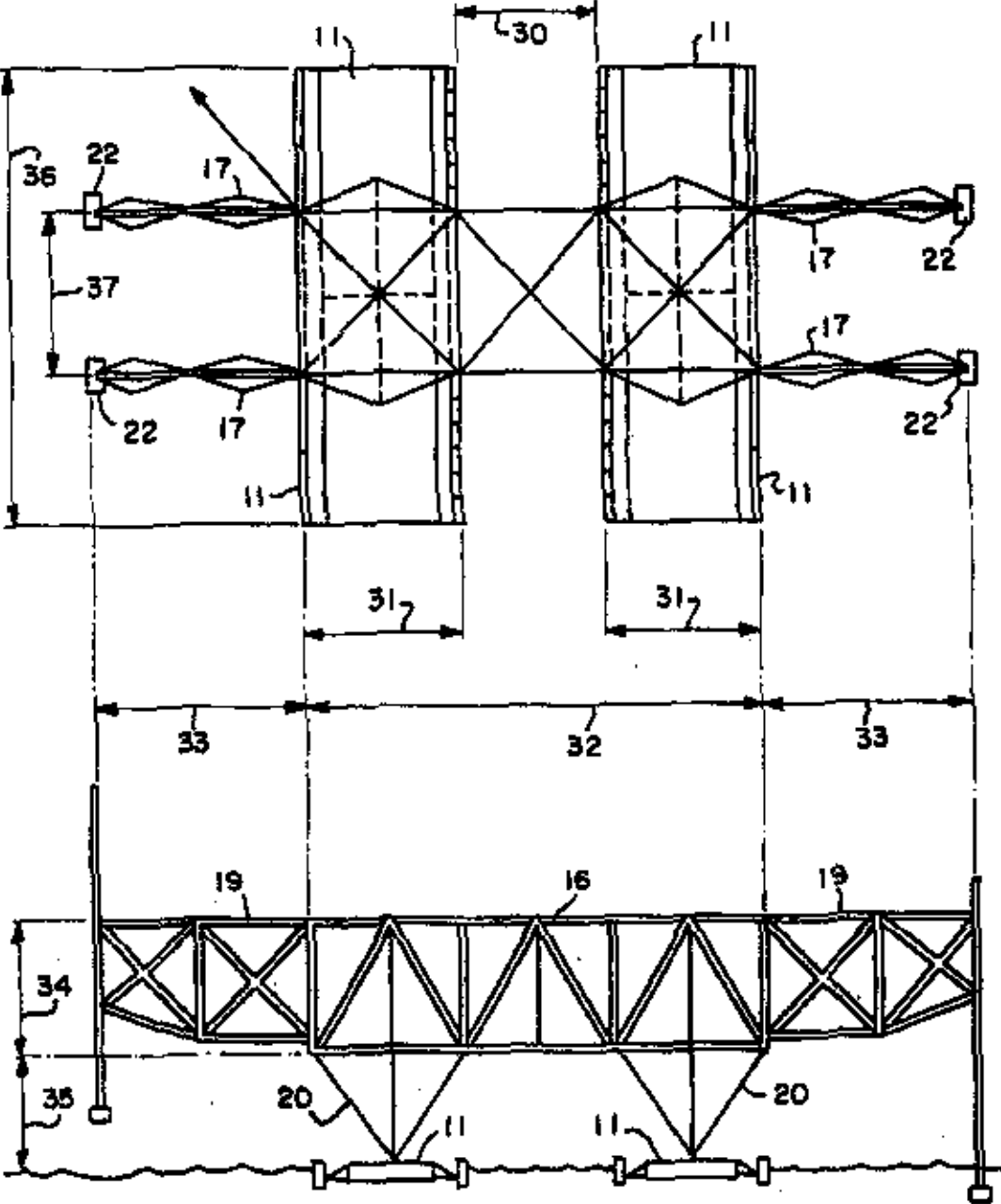


FIG. 5B

employing a large number of sense points and by limiting the prediction to a very short time.

A large number of Wave Sensors will be located in the AACTS vicinity. Non-contact sensors, such as ultrasonic, microwave, or laser range finders, are preferred because of their logistic simplicity. The sensors will continuously monitor and measure the relative heights of the waves in the vicinity of the AACTS.

Data from the Wave Sensors will be read into the Wave Prediction Computer through the Wave Sensor Scanner. The Wave Sensor Scanner is simply a multiplexer that will read each wave sensor one at a time and pass the readings to the Wave Prediction Computer. The Wave Prediction Computer will then calculate an expected activity for the next computational frame and provide to the Master Control Computer a "topographic map" of the ocean in the AACTS vicinity. The map may include velocity, acceleration and energy as well as expected displacement. To reduce computational complexity and error, a large number of sample locations and a high sampling frequency are anticipated.

As shown in the block diagram of FIG. 26, the Mooring Computer will control Winch Motors that can let in/out the AACTS mooring lines in order to optimally secure the AACTS. The Mooring Computer will monitor Wind and Current Sensors, as well as Tension Sensors and the Cable Angle of the various mooring lines.

The sensor information will be passed onto the Master Control Computer which, together with the information on the attitude of the lighters and ships, will develop commands for the winches based on the AACTS global situation.

The Leveling Computer, shown in block diagram in FIG. 27, will provide the Master Control Computer with feedback regarding the position of the transverse frame. The Leveling Computer will monitor the Frame Mounted Gyros in the AACTS and calculate the attitude of the frame with respect to the horizontal plane. Linear Displacement Transducers will measure the length of the supporting Hydro-Pneumatic Actuators that form the four support tripods. The resulting information will be used by the Master Control Computer to determine what commands will be given to the legs of the various tripods. In this way, the AACTS frame can be held level and fixed in space (to within a predetermined tolerance).

The length data will also be fed back to the individual Actuator Servo Control electronics which control the Hydraulic Servo Valves. It is expected that the Pneumatic Valves will be controlled directly by the Leveling Computer.

The Leveling Computer will also control the Hydraulic and Pneumatic Power Supplies which supply power to the Hydraulic-Pneumatic Actuators. The Hydraulic and Pneumatic Power Supplies include motors, pumps and accumulators.

The Berthing Control Computers provide assisted berthing of the ships and lighters. While they are very similar, there are two types of Berthing Control Computers, one for the ship and one for the lighters. It is planned that there will be one of each type of computer per Delong barge (for a total of 8 berthing computers). FIG. 28 shows the block diagram of the lighter berthing computer.

The Lighter Berthing Control Computer accepts position commands from the Master Control Computer for the desired attitude of the lighter. The position is given in terms of Roll, Pitch, Yaw, Heave, Surge and Sway

with respect to the Delong barges. The Berthing Control Computers must perform a real-time coordinate conversion to change the data into actuator leg lengths for each of the berthing modules. Each module is supported by six Hydraulic Actuators that form a synergistic 6 DOF platform. Once the desired leg lengths are calculated, the length commands can be passed on to the actuator Servo Control subsystem which controls the length of the Hydraulic Actuators. The Servo Control sends command to the Servo Valves. The length of the actuators are fed back to the Servo Control subsystem and the Berthing Control Computer via the Linear Displacement Transducers.

The Berthing Control Computer will perform a reverse coordinate conversion calculation to present the Master Control Computer and the Relative Position Computer with the actual attitude of the lighter. The Master Control Computer will use the information to control the Lighter Manipulator Computers.

The Berthing Control Computers also control the Hydraulic Power Supply for the Hydraulic Actuators.

The Lighterage Berthing Control Computer also controls the operation of the Attachment Systems. One Attachment System is mounted on each of the berthing modules. One expedient is a vacuum gripper to attach the berthing modules to the side of the lighters. In operation, the individual berthing modules would be positioned by the Master Control Computer to ease an approaching lighter into position at the AACTS. The Attachment System would be turned on when the Lighter is in contact with the berthing module.

Because the berthing modules can independently move in 6 DOF, and the Attachment Systems can be turned on and off, the Berthing Control Computers can reduce the motion of the lighter. This system could also warp lighters through the craft loading area by controlling the motion of various berthing modules. The Berthing Control Computers could also automatically cast off lighters. These activities would be under the control of the Master Control Computer.

The Ship Berthing Control Computers are similar but much simpler. They consist of the Servo Control, Servo Valves, Linear Displacement Transducers, and Hydraulic Power Supplies to control the berthing modules on the ship side.

The Relative Position Computer, shown in block diagram in FIG. 29, is not complex. This computer is used strictly for computation, not control. The Relative Position Computer takes the attitude information from the Berthing Control Computers and the Leveling Computer and computes the position of the Lighters with respect to the transverse frame.

The Lighter Manipulator Computers, shown in block diagram in FIG. 30, receive commands from the Master Control Computer. The command tell the Lighter Manipulator Computers the relative coordinates in space of a target container location and what actions to perform (pick up/put down). The Master Control Computer commands will be relative to the transverse frame. The Lighter Manipulator Computers will take the information provided by the Relative Position Computer and determine where in space the manipulator should place the spreader.

The Lighter Manipulator Computers must convert the desired location into commands for the manipulator position control. The Lighter Manipulator Computers must control the position of the manipulator arm in the

A principal attribute of the AACTS is system automation. AACTS automates the entire process of handling containers off shore. The operational features of the automation is shown in the various block diagrams that form part of this disclosure. The state of the art provides well known available implementations of the various sensing, feed-back, and control features.

The object of the automated control system is to insure that the cargo is handled in the safest and most productive manner. In basic terms, the automated control system will assist in the berthing of lighters and ships, reduce the relative motion between the AACTS and the lighters, keep the AACTS frame stable, control the cargo handling manipulators to provide accurate placement and removal of containers, control the container conveyor system, maintain correct mooring of the AACTS, manage safety systems, and provide timely and accurate information to the system operator.

In addition, the automated system will be complemented by a manual override system which will give the operator full control of the system and its components.

The AACTS control system will perform all of these functions using a distributed processor system design. The use of distributed processors will permit the system to be designed and tested in a stepwise manner, ease maintenance and repair, maximize system reliability, and minimize system cost.

State-of-the-art techniques will be employed throughout the system. Modern methods of materials handling used in today's robotics based automated factories is applicable for "picking" and "placing" the cargo. The 6 DOF motion base technology used in the latest flight simulators provides the flexibility needed to mechanically follow moving lighters and containers. The algorithms used to coordinate the manipulator movement with the containers moving with the ship or lighter are similar to those used in fighter aircraft to lock onto, track, and intercept moving targets. Artificial intelligence in the form of an expert system will aid in the stowage and unloading plans to ensure that the most efficient cargo handling assignments are made.

A block diagram of the automated control system is presented in FIG. 23. The operational blocks include:

- Master Control Computer
- Operator Interface
- Wave Prediction Computer
- Mooring Computers
- Leveling Computer
- Berthing Control Computers
- Relative Position Computer
- AACTS to Lighter Manipulator Computers
- AACTS to Ship Manipulator Computers
- Conveyor Control Computer
- Safety Computer
- Manual Override System

The basic hardware blocks of the individual processors are discussed briefly below. In the block diagrams conventional and known details such as Analog to Digital Converters, and Multiplexers are omitted for clarity.

As shown in FIG. 23, the Master Control Computer is the hub of the distributed control system. The Master Control Computer manages the system global data, coordinates the system communications functions, performs the system safety functions, controls the stabilization functions, manages the various cargo handling devices, manages the berthing and warping functions, and provides operator interface.

The Master Control Computer will base many of its control decisions on data provided from a number of sensors instantaneously reporting ship and lighter positions relative to the AACTS. In addition to the data regarding the instantaneous position, the Master Control Computer will predict what the relative positions will be for the next computational frame. Computational frame is defined as the time required for the Master Control Computer to make one pass through its main control loop, a small fraction of a second. The prediction calculation will be supported by velocity and acceleration feedback sensors, as well as data provided by the Wave Prediction Computer. Predictions based on acceleration and velocity are commonly used in control systems, but the use of a Wave Prediction Computer is unusual.

Through the Operator Interface, shown in block diagram in FIG. 24, the Master Control Computer is provided with information such as facts regarding ships, lighters and containers. This information includes general data related to the physical configuration of various container ships and lighters and data specific to the current operation such as ship cargo manifest, ship stow plans, lighterage queues, and cargo.

The Operator Interface also provides information from the AACTS to the operator. This information includes the status of the various systems and subsystems, and a real-time graphic display of the location of cargo moving through the AACTS. The Operator Interface will also provide emergency controls and a bank of television monitors that display the activity at various locations within AACTS.

The System Monitor and System Keyboard are the standard input output devices for the Master Control Computer. Through these devices the operator can set up and control the AACTS automated system. The operator can provide information such as facts regarding the current status of ships, lighters and containers.

The Graphic Display will present the operator with a real-time view of AACTS activities. It is anticipated that through the use of the Graphics Display an operator will be able to monitor each container in the system, the current positions of the manipulator arms, the attitude of the transverse frame, and status and position of each lighter.

In addition to the Graphics Display a conventional Annunciator Panel will be used to display the operational status of critical components. The displays will include such items as safety interlocks, temperatures, and pressures.

A number of television cameras are strategically located throughout the AACTS. Through the use of the TV Monitor Controls and TV Monitors, an operator will be able to efficiently observe critical operations. Override Controls are provided to safely terminate automatic operations.

Mass Storage will be provided with the Operator Interface so that data can be entered and transferred to the system. For example the ship's manifest may be rapidly loaded onto the Mass Storage device.

The Wave Prediction Computer, shown in block diagram in FIG. 25, monitors wave activity in the vicinity of AACTS, predict activity for the next computational frame and provide the information to the Master Control Computer. While accurate wave predictions are normally considered to be extremely complex, it is anticipated that AACTS will reduce the complexity by

tions, each 40 ft long, have diameters of 16, 20 and 25 inches.

In addition to its vertical movement, the rigid hoist is able to rotate the spreader bar 22 about the vertical axis. Once the manipulator arm is positioned over the target, the hoist moves in the vertical to place the spreader bar in close proximity to the target. The end of the hoist then rotates about the vertical axis to orient the spreader bar with respect to the container placement.

The automated containership cargo manifest (an existing feature in the Army's Standard Port System) and the ship's automated loading plan will provide location, size, weight and other data for each container. By combining this information with data from the sensors that report the ship and lighter attitudes, the manipulator arm will place the spreader close to the container location. However, fine-tuning will be required. This fine-tuning will be provided by the intelligent spreader bar control system.

The spreader bar will have a 6-DOF positioning system, similar to that used for the berthing modules. FIGS. 21A and 21B best show the spreader bar 22. The spreader bars will also be equipped with sensors to determine the exact position of the target container relative to the spreader. For example, the spreader bar sensor system may consist of a solid state TV camera and an array of ultrasonic range finders. In operation, the TV camera would be used to provide a video picture to the sensor computer system. The computer system would analyze the video image to determine the location of the edges of the container. The array of range finders would be used to form a 3-D image of the top of the container (or the deck of the craft). By combining the data from these sensors, the computer can determine the exact container position relative to the spreader bar. The computer would then develop the commands to position the spreader bar to mate with the container location. The spreader bar, generally designated 22, comprises connecting means 100 by which it is affixed to the manipulator arm, and a hydraulic actuator set 101 comprising a plurality of actuator cylinders 102. The main body 103 of the spreader bar is provided at its distal ends with cargo grasping means 104 of conventional construction.

The conveyor system 18 is located inside the transverse frame. It moves containers laterally between container loading/unloading platforms at the ship and lighter stations. The conveyor also provides for buffering of containers.

In normal operation, a container would be removed from the ship and placed on the conveyor shipside receiving platform. The conveyor would carry the container to a platform on the transverse frame above a waiting lighter. A lighterage manipulator arm would then lift the container off the conveyor and place it on the lighter. If a lighter was not in a position to receive a container, the container would remain, buffered, on the conveyor until a lighter was ready. The design is such that a number of containers can be buffered. This allows the shipside manipulator arms to work the ship with little regard for lighter availability.

The conveyor system will allow a container to move to any of the loading/unloading points on the transverse frame. This includes the four shipside locations and the four lighterage locations.

In addition to the ship manipulators, similar manipulators will be used to transfer cargo to the lighters for loading in the central area between the two container-

ships. These robotic arms would be similar to the ship-side arms, but would not include the upper arm portion because an extended reach capability is not required. This is shown in FIG. 22. In lieu of the upper arm, the lighterage forearm 105 is made move flexible. It is attached to the transverse frame 16 by a pivoting shoulder 106. The horizontal members consist of actuators 107 that will give the arm a basic radius of reach that can vary from 40 to 60 feet (a coverage of approximately 3000 sq ft). In addition, if the upper and lower actuators are set at different lengths, the radius of reach can be further extended (a coverage of approximately 8500 sq ft).

The power system will be required to provide both electrical and hydraulic power for operation of the interface stabilization systems and to operate the manipulators which transfer containers. Diesel engine or turbine type prime movers may be used to drive the hydraulic pumps and electrical generators or alternators. Hydraulic accumulators will be used to store hydraulic fluid under pressure to permit the operating systems to have peak powers greater than the maximum output of the prime movers.

Prime movers would be located in each quadrant, with interconnections provided to permit sharing between quadrants and with multiple hydraulic accumulators for storage.

Operation of the AACTS will require several thousand horsepower for operating the eight manipulators and the container buffer/conveyor system, as well as the ship/lighter interface stabilization modules. The use of four separate power sources (one on each barge) will add to the system reliability and will provide more efficient operation when less than full power is demanded.

Conventional power units can be readily adapted to meet the power system requirements. Either high torque dc type electrical motors or hydraulic pump-/motors could be used to power the manipulators. Hydraulic actuators will operate the ship/lighter interface stabilization modules. Hydraulically powered self-tensioning winches for the mooring system have been in use for many years, although some controls development may be needed to integrate winch operations with positioning of the overall AACTS. Specifically, the constant tensioning controls could be placed with a computer controlled, variable tensioning, position feedback control system.

The manipulator arms will require power for their various movements. Manipulator power may be either electrical or hydraulic or a combination of electrical and hydraulic motors. Since speed is an important factor for achieving the desired cargo throughput, both vertical and horizontal movements should be at least 120 ft per minute, these operational requirements will determine the needed peak power.

The motion system for the berthing modules may be expected to exert or withstand forces of over 100 kips from containerships with a 30 knot beam wind. A 2000 psi hydraulic system with an equivalent cylinder diameter of 8 inches can withstand the 100 kips of force resulting from the 30 knot beam winds, so it is expected that the system should be capable of standing off much higher forces if necessary. Wave forces resulting from sea and swell will produce oscillatory forces and motions which are time dependent variables, and which will most likely be the single most difficult function for the AACTS to handle for SS3 and higher.

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ASUNTO	Radicación	005128100
	Trámite	011
	Evento	379
	Actuación	430
	Oficio	5363
	Folios	12

Patente de Invención ☒ Patente de Modelo de Utilidad ☐

Vía Nacional ☐

Vía PCT (fase nacional) ☒ Cap. I ☐ Cap. II ☒

No. Sol. Internacional PCT/PT2004/000011

Fecha de Presentación Internal. 03-06-2004

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. Documentos estudiados

Descripción:	Folios: 3 a 27
Reivindicaciones:	Folios: 28 a 31
Dibujos:	Folios: 33 a 40
Prioridad:	Folios: 3 a 40
	06-06-2003. PT 102968

2. Objeto de la invención

- Título de la solicitud: "PORTICO CON PRETENSADO DE AUTO-AJUSTE" (folio 3).
- Objeto de la invención:

Según el autor existen algunos riesgos e inconvenientes con los porticos de la técnica anterior ya que por las cargas variables que soportan pueden conducir a una gran cantidad de deformaciones y tensiones que debilitan la estructura y que pueden llevar a un colapso de la misma. El uso de cables con pretensado ajustable han sido utilizados en el pasado sin embargo estas

no. 109018

estructuras requieren de la Introduccion de herramientas externas para aumentar o reducir la tensión de los cables de este tipo.

El solicitante propone entonces un pórtico con un sistema automático o semiautomático, para ajustar el pretensado de la estructura del pórtico de acuerdo a las acciones externas que se aplican sobre el mismo cuando se presentan las cargas.

- El objeto de esta invención se clasifico como E01D21/00 según la Clasificación Internacional de Patentes (IPC.).

3. De la solicitud de Patente

3.1. Reivindicaciones (artículo 30 D 486)

Después de realizar el estudio completo de la solicitud, se hacen las siguientes observaciones a este capítulo:

- Dentro del capítulo reivindicatorio es repetitiva la expresión. "dicha", se sugiere al solicitante hacer una referencia clara de los elementos y no repetir estas expresiones. Adicionalmente eliminar y no incluir términos imprecisos como "al menos", "por lo menos", etc.
- Se sugiere al solicitante incluir dentro de todas las reivindicaciones los números de referencia de cada uno de los elementos que hacen parte de la invención entre paréntesis (), de acuerdo con la numeración empleada en los dibujos (figuras 1 a 10), con el fin de hacer mas fácil y sencilla la comprensión de la materia objeto reivindicada.
- No se aceptan dentro de las reivindicaciones ventajas, resultados o efectos a alcanzar, por lo tanto, se sugiere al solicitante eliminar las siguientes expresiones: "adaptado para variar la tensión de dicho cable aislado de acuerdo a dicho controlador, de tal forma que dicha tensión se aumenta en respuesta a la carga aumentada o fuerzas internas de dicha estructura principal, o se reduce en respuesta a la carga reducida o fuerzas internas de dicha estructura principal" (Reiv. 1), el contenido completo de las reivindicaciones siete y nueve (7, 9). Por lo anterior, estas expresiones no serán tenidas en cuenta en el examen de patentabilidad.
- Según el Artículo 15 incisos e) y f) no se consideran invenciones los programas de ordenador, el soporte lógico y las formas de presentar información. Por lo tanto, se sugiere al solicitante eliminar del capítulo reivindicatorio las siguientes expresiones: "convirtiendo dichas mediciones en datos leibles y proporcionando dichos datos a un controlador" (Reiv. 1), el contenido completo de las reivindicaciones dos, tres, doce y trece (2, 3, 12 y 13). Por lo anterior, el contenido de ellas no será tenido en cuenta en el examen de patentabilidad.
- Eliminar la reivindicación dieciséis (16) que supuestamente hace referencia a un método pero no contiene ninguna etapa que así lo determine y por el contrario solo se hace referencia a la estructura de la reivindicación uno (1).

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- Eliminar la reivindicación cuatro (4) que extrañamente hace referencia a la acción que una persona hace al operar manualmente un tablero, estas expresiones no son aceptadas dentro de este capítulo.

4. Determinación del Estado de la Técnica

Teniendo en cuenta que la fecha de presentación internacional es 06-06-2003, se encontró el siguiente documento relevante:

N.	Documento	Título	Fecha de pub.
D1	US5154561	AUTOMATED ALL-WEATHER CARGO TRANSFER SYSTEM	13-10-1992

5. Análisis de patentabilidad (artículo 14 D486)

5.1 Novedad (artículo 16 D486)

Al comparar elemento por elemento de la invención tal como esta definido en la reivindicación uno (1) con el documento D1, encontramos que el mencionado documento revela todos los elementos y características de dicha reivindicación:

Reivindicación Uno (1, folio 28)	D1
1. Un pórtico para utilizarse en el proceso de construcción de puentes, viaductos y otras estructuras, dicho pórtico comprendiendo.: Una estructura principal.	SI Ver: elementos 10, 17 figura 2.
2. Al menos un cable aislado; un primer amarre para asegurar un extreme de dicho cable aislado a dicha estructura y un segundo amarre para asegurar el extreme opuesto de dicho cable aislado a dicha estructura.	SI Ver: columna 23 línea 27, figuras 2-5b.
3. Caracterizado porque se proporciona al menos una unidad de sensor capaz de medir una variación física en dicha estructura principal indicativa de carga o fuerzas de la estructura principal, una interface electrónica, un controlador y un accionador.	SI Ver: columna 19 línea 25 a 30, wave sensor figura 25, tension sensors, cable angle sensors figura 26, columna 22 filas 17 a 25 figura 23, figuras 26-28, hydraulic actuators figura 28.

De acuerdo con lo anterior, todos los elementos y características que forman parte del "PORTICO CON PRETENSADO DE AUTO-AJUSTE" mostrados en la reivindicación independiente uno (1, folio 28), ya fueron divulgados en D1, por lo cual se podría considerar que carece de novedad. Teniendo en cuenta que la parte característica de la reivindicación independiente uno (1) hace clara referencia a un conjunto de elementos que forman una interface electrónica que convierte dichas mediciones en datos leibles transmitiendo dichos datos para activar un accionador y aumentar o reducir la tensión de los cables de acuerdo a esas mediciones tomadas se puede afirmar en base a la Decisión 486 que la invención como fue definida en este capítulo no es patentable (ver numeral 3).

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Las reivindicaciones 1-12 no muestran en forma clara lo nuevo que se pretende aportar a la técnica ni aporta diferencias a lo ya existente. El análisis anterior permitiría afirmar que la presente solicitud no cumpliría con lo estipulado en el artículo 16 de la Decisión 486 de la Comisión de la Comunidad Andina de Naciones.

6. Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

N°	Documento	Reivindicaciones afectadas	Requisito que afecta
D1	US5154561	1-12	NOVEDAD

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta (60) días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe de División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista, de fecha

14 ABRIL 2000

CONCEPTO TÉCNICO No 2143	EXAMINADOR TÉCNICO Código No.202086
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