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Friedmann(10) **Pub. No.: US 2013/0136546 A1**(43) **Pub. Date: May 30, 2013**(54) **REGIONAL, NATIONAL AND
INTERNATIONAL TRANSPORT-WEB
INFRASTRUCTURE NETWORK SYSTEM**

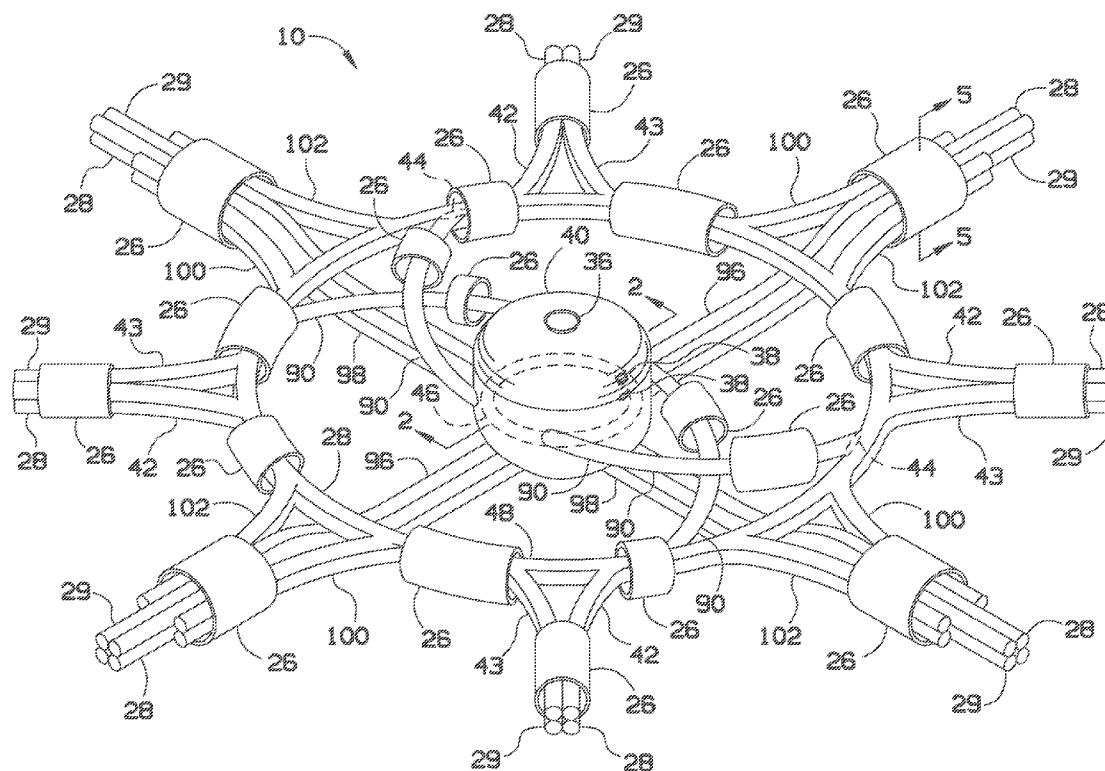
USPC 406/181

(76) Inventor: **Jan Friedmann**, Los Angeles, CA (US)(21) Appl. No.: **13/562,298**(22) Filed: **Jul. 30, 2012****Related U.S. Application Data**

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B65G 51/26 (2006.01)(52) **U.S. Cl.**
CPC **B65G 51/26** (2013.01)(57) **ABSTRACT**

A land-based transportation and infrastructure system that allows high-speed transport for passengers, freight transport, a power management and distribution system. The transport-web infrastructure network system (T.W.I.N.S.) design includes a containment tube-link network that contains within it a transport tube-link network and a utilities grid infrastructure. The transport tube-link network is a vacuum environment within which a transport capsule is levitated by permanent magnets located in the interior of the transport tube plus super-conducting bulk elements located on the capsule and thus combined with a liquid coolant, such as nitrogen or helium, allows for greater speed since no friction exists within such a vacuum environment. Typically, the containment tubes are designed to be sub-ground, even though above ground is also an option.



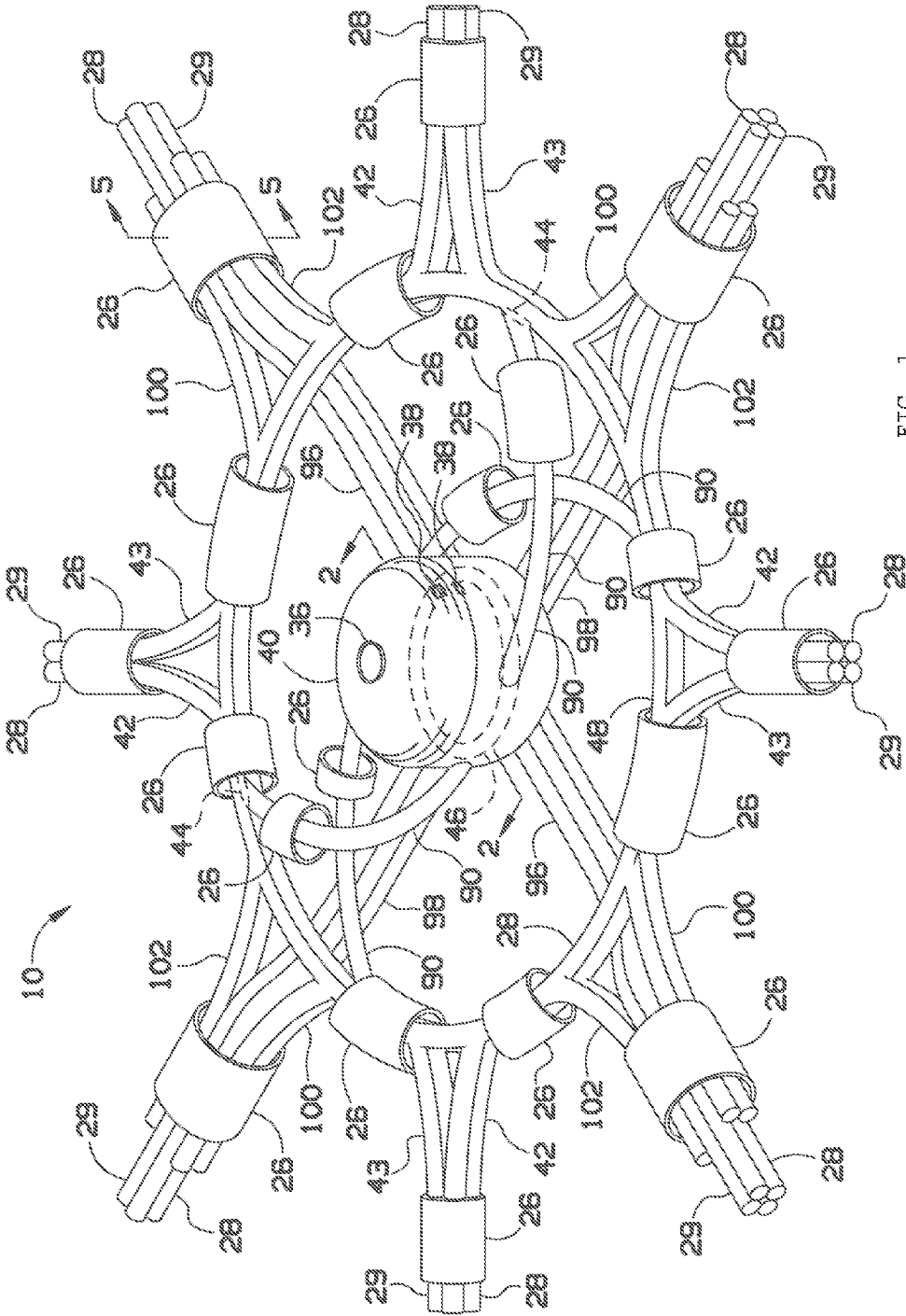


FIG. 1

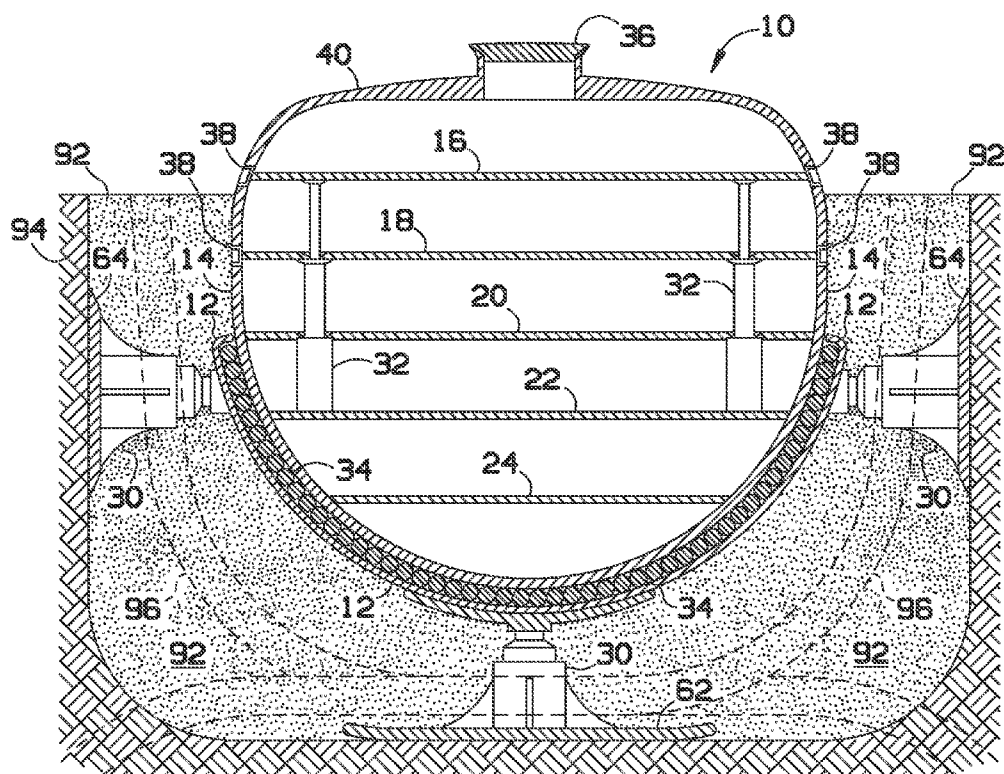


FIG. 2

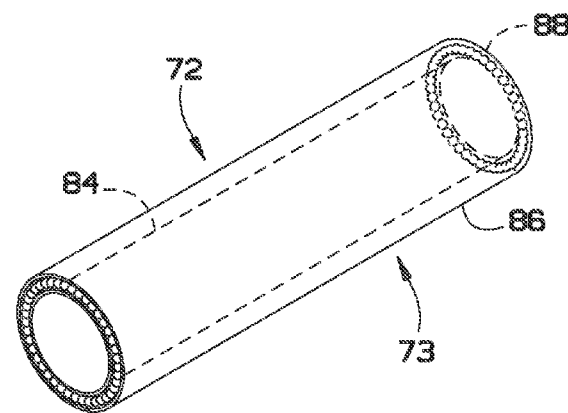


FIG. 3

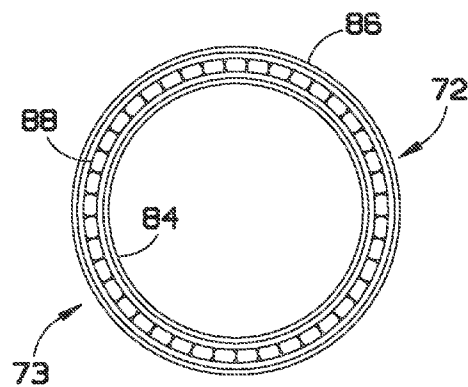


FIG. 4

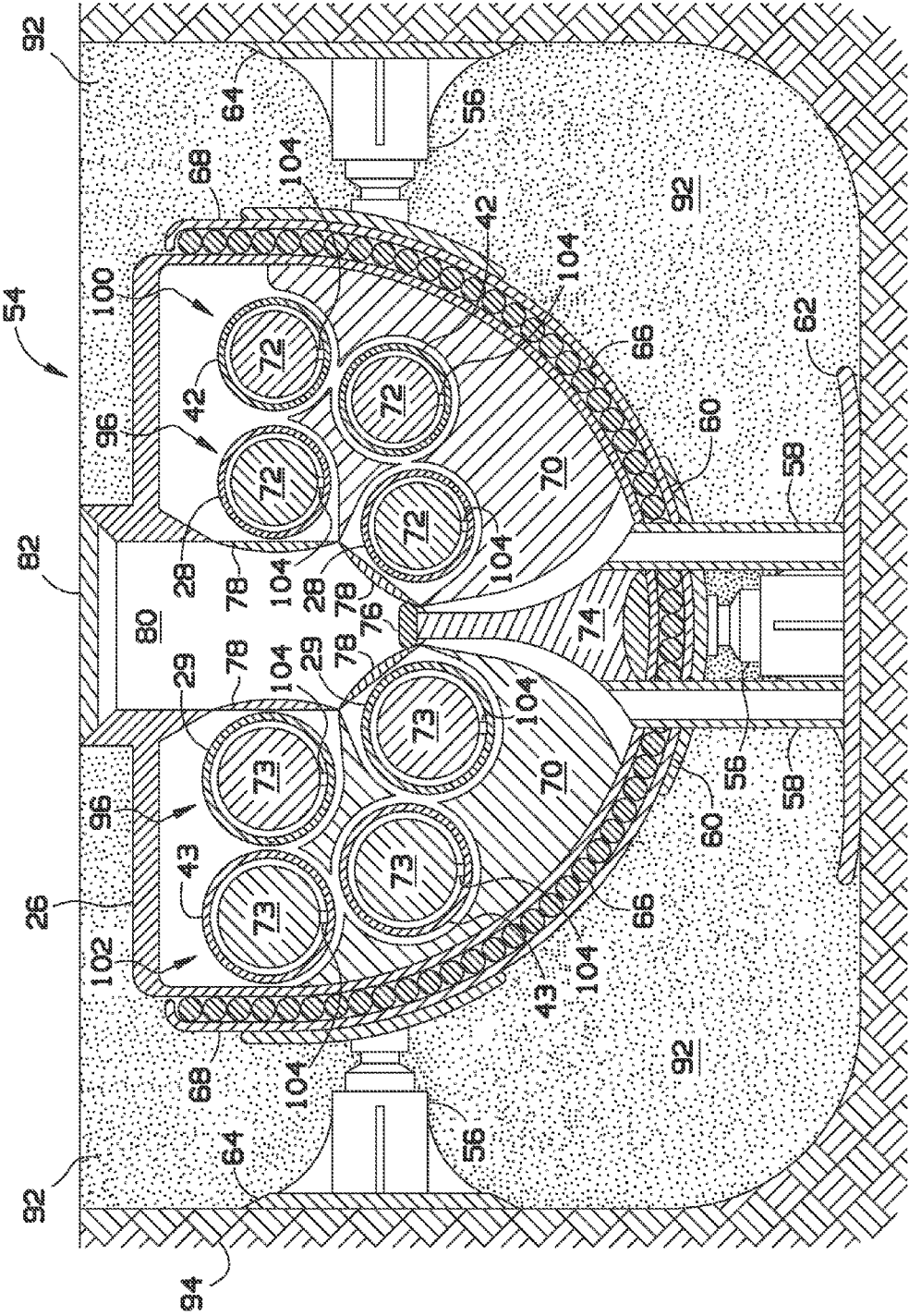


FIG. 5

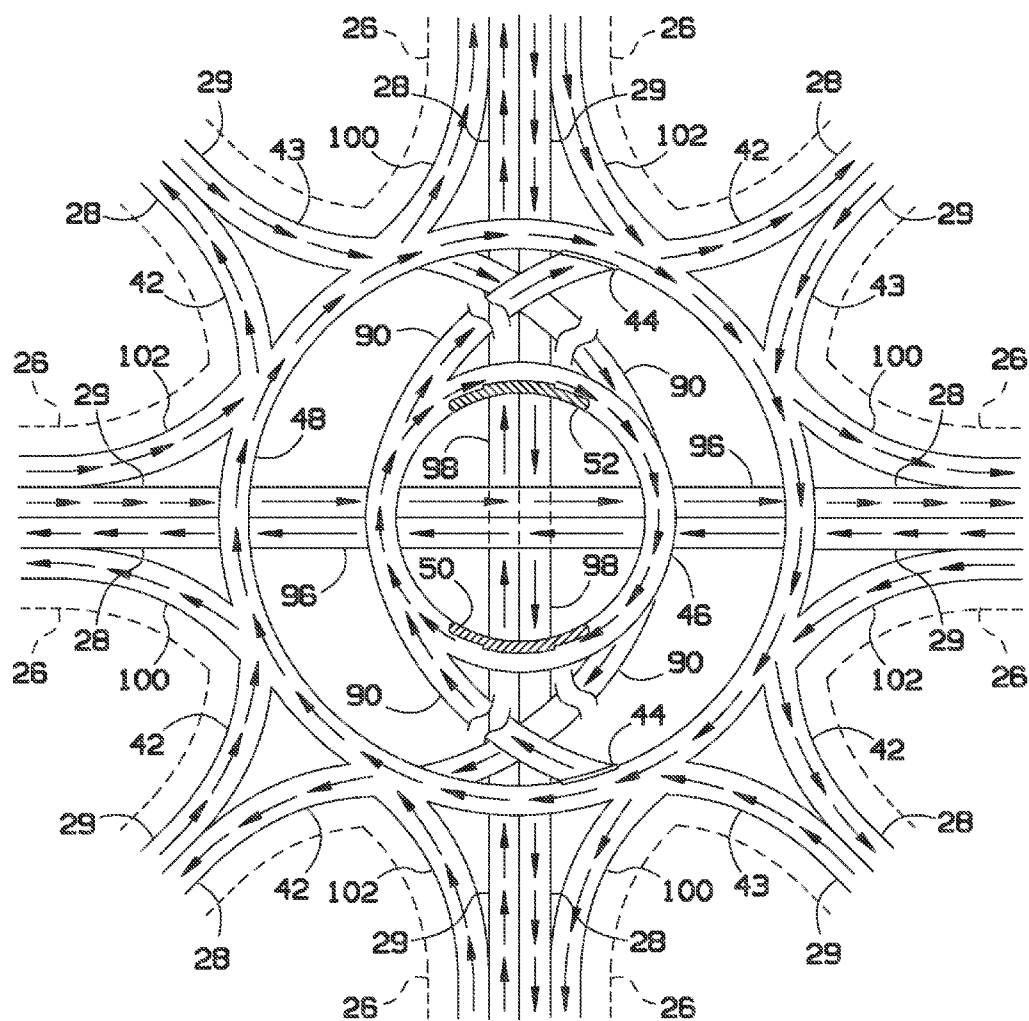


FIG. 6

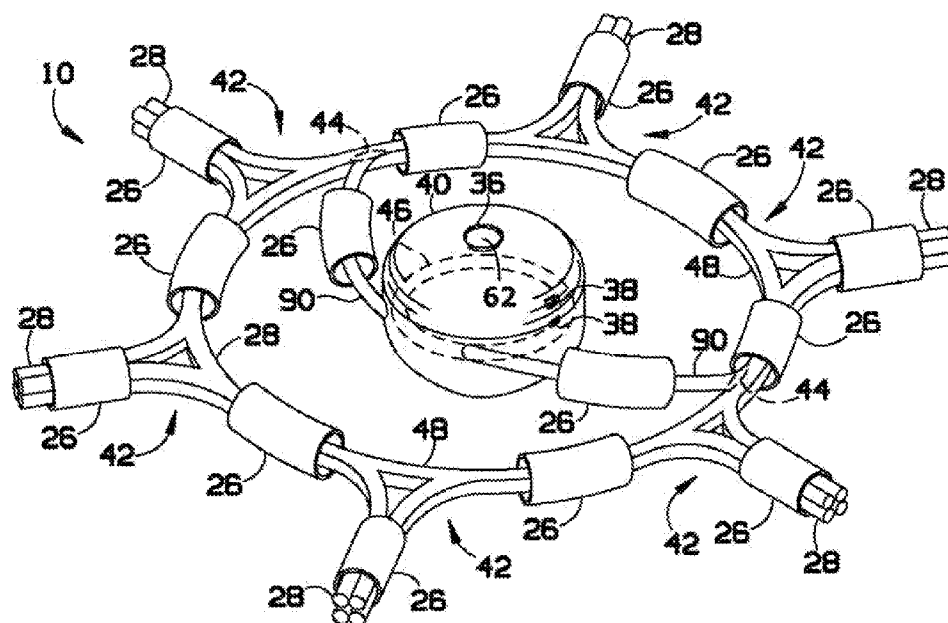


FIG. 7

REGIONAL, NATIONAL AND INTERNATIONAL TRANSPORT-WEB INFRASTRUCTURE NETWORK SYSTEM

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of priority of U.S. provisional application No. 61/512,759, filed Jul. 28, 2011, the contents of which are herein incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to transportation systems and, more particularly, to a land-based transportation and infrastructure system using airtight/airless transport tubes to guide magnetic levitation vehicles and to provide a conduit for utilities infrastructure, such as power, water, and the like.

[0003] There are many types of transport systems that can move objects on a guide-way. Examples include wheel-suspended vehicles propelled by rotary or linear motors, vehicles that move in tubes propelled by air pressure, vehicles supported or guided by bearings and vehicles that are moved on conveyor belts. Existing transport systems have many useful applications. However, there are opportunities for substantial improvement by providing a scalable, secure, and environmental friendly transportation and infrastructure system.

[0004] All present infrastructure and transportation systems are limited and require each other to sustain a delivery of goods and persons. The problem being is that there is no single-standard national or international infrastructure and transportation system.

[0005] Current systems do not work well because they are typically limited in function and efficiency because they are dependent on fossil fuels that damage the environment. These conventional systems cannot service comprehensive and uninterrupted travel or cargo transport or provide a utilities grid independently and must rely on other current transport systems to complete delivery of persons, goods and power.

[0006] The current transportation systems that include aircraft, trains, ships, commercial trucks, and the like, have reached their maximum speed and efficiency capacities and burn environmentally damaging fossil fuels to operate. The highest speeds attainable by the fastest of these systems (aircraft) is approximately 700 miles per hour. Additionally, the inefficiencies of the current transport systems include a great deal of waste, pollution, limited speed, costly maintenance and replacement of parts, exposure to time delays, travel cancellations due to environmental and climatic conditions and the lack of ability to adjust to environmental and climatic conditions.

[0007] As can be seen, there is a need for an improved transportation and infrastructure system that can quickly, safely and efficiently deliver people, goods and power.

SUMMARY OF THE INVENTION

[0008] In one aspect of the present invention, a transport-web infrastructure network system is comprised of a transport containment/housing tube; a plurality of transport tubes disposed in the containment/housing tube, the plurality of transport tubes operable under vacuum to magnetically move one or more transport capsules therewithin; a plurality of bypass stations interconnected by the plurality of transport tubes.

Tube facilities within the housing tube can be used to transport utilities, such as electric power.

[0009] In another aspect of the present invention, a transport-web infrastructure network system comprises a transport system containment/housing tube disposed sub-ground; a plurality of transport tubes disposed in the containment/housing tube, the plurality of transport tubes operable under vacuum to magnetically move one or more transport capsules therewithin; a plurality of bypass stations interconnected by the plurality of transport tubes; an outer perimeter safety catch system surrounding the bypass stations; outer perimeter transition tubes to and from the outer perimeter safety catch system; sand surrounding the containment/housing tube; a hydraulic shock absorber attachment fitting along an outer surface of the containment/housing tube; a hydraulic shock absorber disposed between the hydraulic shock absorber attachment fitting and a platform disposed on a sub-ground surface; a left and a right side hydraulic shock absorber attachment fitting along a left and right hand side of an outer surface of the containment/housing tube; and a hydraulic shock absorber disposed on the bottom and between each of the left and the right side of the housing tube are hydraulic shock absorber attachment fitting and a side platform disposed on a sub-ground surface.

[0010] These and other features, aspects and advantages of the present invention will become better understood with reference to the following drawings, description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a perspective view of a bypass-station and tube network component in the transport-web infrastructure network system (T.W.I.N.S.) according to an exemplary embodiment of the present invention;

[0012] FIG. 2 is a cross-sectional view of a bypass-station, as taken along line 2-2 of FIG. 1;

[0013] FIG. 3 is a perspective view of a maglev transport tube can capsule according to an exemplary embodiment of the present invention;

[0014] FIG. 4 is an end view of the maglev transport tube of FIG. 3;

[0015] FIG. 5 is a cross-sectional view of a maglev service and repair station taken along line 5-5 in FIG. 1;

[0016] FIG. 6 is a detailed top view of the T.W.I.N.S. system according to an exemplary embodiment of the present invention; and

[0017] FIG. 7 is a perspective view of a T.W.I.N.S. system having a single entry/exit to/from the station to the catch/loop, according to another exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0018] The following detailed description is of the best currently contemplated modes of carrying out exemplary embodiments of the invention. The description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating the general principles of the invention, since the scope of the invention is best defined by the appended claims.

[0019] Broadly, an embodiment of the present invention provides a land-based transportation and infrastructure system that allows high-speed mode of passenger travel and freight transportation in addition to providing facilities to transport utilities, such as electric power, water and the like. The system design includes a containment tube-link network

that contains within it a transport tube-link network and a utilities grid transference/management system infrastructure. The transport tube-link network is a vacuum environment within which a transport capsule is levitated by permanent magnets located in the interior of the transport tube plus super-conducting bulk elements located on the capsule and thus combined with superconductors and liquid coolant, such as nitrogen or helium, allows greater speed capacity since no friction exists within such a vacuum environment (like outer space). Typically, the containment/housing tubes are designed to be sub-ground, even though above ground is also an option.

[0020] The system of the present invention includes several main components. The bypass stations make up a network of self-sufficient and contained mini-city stations that are linked by a common and single-standard infrastructure and transportation system. Each station will begin with establishment of the interconnecting transport tube-link element and system. The remaining internal development of the stations will follow. The bypass stations network forms the system's infrastructure foundation. The containment/housing tube network system is the primary system network that interconnects all bypass stations. The internal transport tubes make up the actual tube-link network that forms the transport system magnetic and vacuum components. The transport capsules/vehicles are the way that people and cargo are loaded and transported to other locations. The ball-bearing grid is located across the bottom of and sides of the containment/housing tube, providing a counter to rocking motion. The hydraulic shock absorbers and motion plate platforms are connected to the outside of the containment/housing tubes and bypass stations. They are located on the bottom and sides of the containment/housing tubes and bypass stations. The sand containment field is used to secure the entire transportation tube-link system. Sand can be placed between the containment/housing tubes and hard soil and surrounding the hydraulic shock's housing. These components are described in greater detail below, with reference to the drawings.

[0021] Referring now to FIGS. 1 through 6, different views of a land-based transportation and infrastructure system 10 are shown according to an exemplary embodiment of the present invention. The system 10 may include a network of airless (vacuum) transport system tubes including one set for passenger transport tubes 28 and another set of transport tubes for cargo transport tubes 29, or a set of three transport tubes (two transport tubes plus one back-up) for all transport needs. The size of the three tube system and capsules is slightly larger than the size of current shipping cargo containers, for example. The transport system tubes 28, 29 may be configured to interconnect land-based transportation hubs i.e. "Terra stations" 40, marine based transportation hubs i.e. "Aqua stations" (not shown) and small transportation portals (not shown). The terra stations 40 and transport system tube 28 may be constructed above ground or sub-ground levels. Magnetic levitation (maglev) transport vehicles 72 may transport people and goods between terra station 40 via transport system tubes 28. The tubes 28, 29 may also be used as utility housing tubes to carry utilities, such as electricity.

[0022] The terra stations 40 may be located +/-200 miles away from each other along the transport system tube 28 network. Smaller portals (not shown) may be located between the terra stations 40 to serve regional needs. The terra station 40 may be constructed as a multilevel structure. The terra station 40 may be constructed with an outer containment shell

12 and a detached inner shell 14. An inner ball-bearing grid/rotational system 34 may be disposed between the outer containment shell 12 and the detached inner shell 14. The containment shell 12 may lie on an attachment cradle 60 of hydraulic shock absorber assemblies 30. The hydraulic shock absorber assemblies 30 may be supported by shock absorber mounting platforms 64.

[0023] In an exemplary implementation, the inside of the detached inner shell 14 may include five station platforms. Pass-through/station transport tubes 90 may be connected to the terra stations 40 at a first station platform 24. The pass-through/station transport tubes 90 may be configured to interconnect an arrival and departure facility 46 to outer perimeter transition tubes 48. There may be multiple pass-through/station transport tubes 90 as shown in FIG. 1, or there may be a single station transport tube 90 as shown in FIG. 7, for example. The arrival and departure facility 46 may circle around an inner perimeter of the terra station 40. The arrival and departure facility 46 may include a passenger loading and unloading platform 50 and a cargo loading and unloading platform 52. The first station platform may be a stationary platform located at the bottom of the detached inner shell 14. The third through fifth station platforms 20, 18 and 16 may be made as lift platforms. Hydraulic lifts 32 may be disposed between adjacent platforms. The hydraulic lifts 32 may allow lowering and rising of the station platforms three through five 22-16. Once station platforms are raised, a set of level locks 38 may be used to secure their position. When the station platforms three through five 22, 18 and 16 are lowered, the upper portion of the terra station 40 may move down, below the ground level for safety. A cover plate 36 may be placed on an access opening 62 on the top of the detached inner shell 14 to isolate the terra station 40 from its environment.

[0024] The outer perimeter transition tubes 48 may form a loop around the terra station 40. The transport system tubes 28 running from other terra stations 40 may merge into the outer perimeter transition tubes 48 via outer perimeter transition tubes 42. The cargo system tubes 29 running from other terra stations 40 may merge into the outer perimeter transition tubes 48 via outer perimeter transition tubes 43.

[0025] The maglev transport vehicles 72 travelling between terra stations 40, after entering into the outer perimeter transition tubes 48 may bypass the local terra stations 40. Alternately, the maglev transport vehicles 72 may enter into the pass-through/station transport tubes 90 via transport vehicle entry valves 44 and may proceed to the local terra station 40.

[0026] An immediate environment around each terra station 40 may include a cavity 94 in the ground, in which the terra station 40 may be housed. Once the terra station 40 has been constructed, the cavity 94, including hydraulic shocks 30, may be filled with sand 92. The sand 92 may cover the sub-ground portion of the containment shell 12 and may provide additional support to the terra station 40.

[0027] The inside of the detached inner shell 14 may be the functional center of the terra station 40. This portion of the infrastructure may be used exclusively for transportation related operations and activities. Areas between the terra stations 40 and portals may be developed and financed by private enterprises and entrepreneurs to provide a variety of functions and services. The terra stations 40 may provide sustainable production of electric power, food, water, shelter, commerce, transportation, commercial, private housing, recreation facilities, and the like.

[0028] Referring now to FIG. 5, a detailed cross-section view of containment and transport tubes taken along line 5-5 of FIG. 1 is shown. The containment/housing tube shell 26 may include an outer shell 68 and a detached inner shell 56. A ball-bearing grid/rotational system 66 may be disposed between outer containment shell 68 and a detached inner shell 56. The containment shell 26 may lie on the attachment cradle 60 of the hydraulic shock absorber assembly 30. The inside of the detached inner shell 56 may house up to four transport system tubes 28 and a service cavity 80. The transport system tubes 28, 29 may be separated from each other by transport tube dividers 70. A plurality of service platforms 74 may be constructed at specific locations along the service cavity 80. A repair vehicle 76 may move service personnel between service platforms 74. Each of the transport tubes 28, 29 and the maglev transport vehicle 72 inside the tube may be accessible from the common service cavity 80, once a tube access panel 78 is removed. Access shafts 58 may be constructed from the service cavity 80 to all the hydraulic shock absorber assemblies 30. A security monitored ground level access panel 82 may provide access for service personnel to the service cavity 80.

[0029] Referring now to FIGS. 3 and 4, different view of the maglev transport vehicle 72 are shown. The transport vehicle 72 may have a cylindrical shape. The maglev transport vehicle 72 may include an outside shell 96 and an inside shell 84. An array of ball bearings may be disposed between the outer shell 96 and the inside shell 84. An exemplary implementation the maglev transport vehicle 72 may have an outside diameter in a range of about 1.7 m to 2.1 m, an internal height of 5-6 feet and a length of about 20 feet. A maglev cargo vehicle 73 may have an outside diameter in a range of about 2.4 to 2.5 meters, an internal height of about 8 feet, 4 inches, and a length of at least about 20 feet.

[0030] While FIG. 1 shows the transport tubes 28 and the cargo tubes 29 having the same size, typically the cargo tubes 29 will be larger than the transport tubes. Various number of tubes 28, 29 may be present in each containment/housing tube 26. In some embodiments, one transport tube 28, going in each direction, plus a back-up tube, may be disposed.

[0031] In addition, in some embodiments, one or more utility conduits can be disposed within the containment/housing tubes 26 to provide a utility grid. The utility grid is managed and can provide electricity throughout a region, country, or internationally. The utility grid provided by the system of the present invention may be a back-up and management/distribution grid to the current utility grid or become a primary grid system. In addition to electricity, other utilities, such as water distribution, can be provided by the system's infrastructure.

[0032] The disclosed land-based transportation and infrastructure system 10 may be easily scalable, its transport vehicles and its footprint on the environment may be relatively small. The land-based transportation and infrastructure system 10 may also give small and middle size business a chance to compete with large enterprises in the international market place, when they can cost effectively ship one to three pallets in maglev transport vehicle 72 versus the large enterprises that more easily will be able to fill a whole shipping container to qualify for discounted shipping.

[0033] It should be understood, of course, that the foregoing relates to exemplary embodiments of the invention and

that modifications may be made without departing from the spirit and scope of the invention as set forth in the following claims.

What is claimed is:

1. A transport-web infrastructure network system comprising:

- a transport system containment/housing tube;
- a plurality of transport tubes disposed in the containment/housing tube, the plurality of transport tubes operable under vacuum to magnetically move one or more transport capsules therewithin; and
- a plurality of bypass stations interconnected by the plurality of the transport system containment/housing tubes and the plurality of transport tubes.

2. The transport-web infrastructure network system of claim 1, further comprising a plurality of utility housing tubes within the containment/housing tube.

3. The transport-web infrastructure network system of claim 1, further comprising transport tubes for passengers and transport tubes for cargo.

4. The transport-web infrastructure network system of claim 1, further comprising transport capsules for passengers and transport capsules for cargo.

5. The transport-web infrastructure network system of claim 1, further comprising a service and repair cavity within the containment/housing tube.

6. The transport-web infrastructure network system of claim 5, further comprising a servicing and repair platform located in the service and repair cavity and a servicing and repair vehicle adapted to move along the servicing and repair platform.

7. The transport-web infrastructure network system of claim 1, wherein the capsules include a double wall with a ball bearing motion system disposed within the double wall.

8. The transport-web infrastructure network system of claim 1, wherein the containment/housing tube is disposed sub-ground.

9. The transport-web infrastructure network system of claim 8, wherein sand surrounds the containment/housing tube.

10. The transport-web infrastructure network system of claim 9, further comprising:

- a hydraulic shock absorber attachment fitting along an outer surface of the containment/housing tube; and
- a hydraulic shock absorber disposed between the hydraulic shock absorber attachment fitting and a platform disposed on a sub-ground surface.

11. The transport-web infrastructure network system of claim 10, further comprising:

- a bottom, left, and right side hydraulic shock absorber attachment fitting along the bottom, left and right hand side of an outer surface of the containment/housing tube; and
- a hydraulic shock absorber disposed between each of the bottom, left and the right side hydraulic shock absorber attachment fitting and a side platform disposed on a sub-ground surface.

12. The transport-web infrastructure network system of claim 1, further comprising an outer perimeter safety catch system.

13. The transport-web infrastructure network system of claim 11, further comprising outer perimeter transition tubes to and from the outer perimeter safety catch system.

14. A transport-web infrastructure network system comprising:

- a transport system containment/housing tube disposed sub-ground;
- a plurality of transport tubes disposed in the containment/housing tube housing, the plurality of transport tubes operable under vacuum to magnetically move one or more transport capsules therewithin;
- a plurality of bypass stations interconnected by the plurality of transport and utility tubes;
- an outer perimeter safety catch system surrounding the bypass stations;
- outer perimeter transition tubes to and from the outer perimeter safety catch system;
- sand surrounding the containment/housing tube;
- a hydraulic shock absorber attachment fitting along an outer surface of the containment/housing tube;
- a hydraulic shock absorber disposed between the hydraulic shock absorber attachment fitting and a platform disposed on a sub-ground surface;
- a bottom, left and a right side hydraulic shock absorber attachment fitting along a left and right hand side of an outer surface of the containment/housing tube; and
- a hydraulic shock absorber disposed between each of the bottom, left and the right side hydraulic shock absorber attachment fitting and a side platform disposed on a sub-ground surface.

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