(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
31 March 2011 (31.03.2011)

PCT

(10) International Publication Number
WO 2011/036657 A1

(51) International Patent Classification:
B60P 3/34 (2006.01) *B62D 33/08* (2006.01)
B62C 1/06 (2006.01)

(21) International Application Number:
PCT/IL2010/000603

(22) International Filing Date:
27 July 2010 (27.07.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
201185 24 September 2009 (24.09.2009) IL

(72) Inventor; and
(71) Applicant : **BACHER, Yoel** [IL/IL]; Borochov 35/1 Raanana 43434 (IL).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to the identity of the inventor (Rule 4.17(i))*

— *of inventorship (Rule 4.17(iv))*

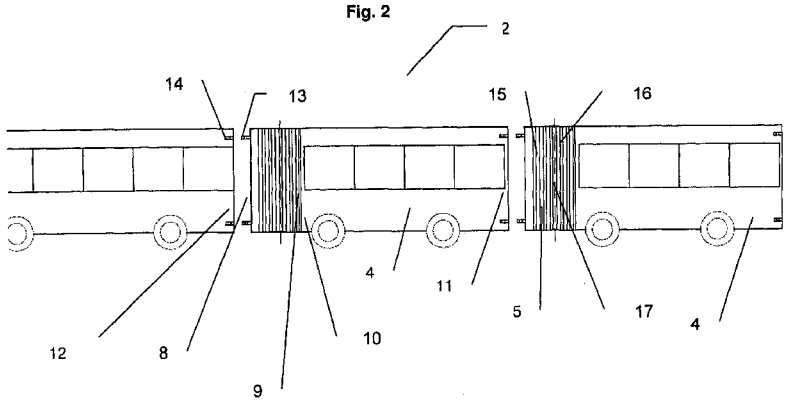
Published:

— *with international search report (Art. 21(3))*

WO 2011/036657 A1

(54) **Title**: ARTICULATED MODULAR TRANSPORTATION VEHICLE HAVING IMPROVED ACCESSIBILITY

Fig. 2



(57) **Abstract**: The accessible articulated modular transportation vehicle (2) of present invention comprise an accessible floor and one or more modules (4) releasably connected to each other and to the main body (3). Additionally, the accessible articulated modular transportation vehicle (2) of present invention comprise one or more power drive units (32a-32e) located at the main body (3) or/and in one or more modules (4). Additionally, accessible articulated modular transportation vehicle (2) of present invention comprise foldable or slidable door (31a-31f) positioned at the rear of the main body (3) and/or at the front and rear of the modules (4).

FIELD OF THE INVENTION

The present invention is related to the field of public transportation vehicles in general, and more specifically to the field of modular articulated public transportation vehicles, and even more specifically to the field of modular articulated public transportation vehicles having improved accessibility.

BACKGROUND OF THE INVENTION

The articulated public vehicles are well known in the art. Although an articulated public vehicles are widely used, mainly in the urban area, there are still many disadvantages. One such disadvantage being that the length of the vehicle is not able to be varied to suit the passenger loading, which varies throughout the day.

It is well known that during certain parts of the day, for example rush hours, the passenger loading is increased and there is a need for articulated vehicle (from now and on, then using term "articulated" means single articulated, bi-articulated or many segment/modules articulated vehicle) in order to provide a larger passenger capacity.

However during other parts of the day, then passenger loading is decreased, the use of articulated vehicle is wasteful (in terms of fuel, ware, etc.) as the necessary passenger capacity could be accomplished by using fewer number of segments or modules connected to the vehicles' main body or by using the vehicles' main body alone.

Therefore, there is a need for a modular articulated public vehicle, comprising one or more modules releasably coupled to each other and to the vehicle's main body.

SUMMARY OF THE INVENTION

The purpose of the present invention is to provide an accessible articulated public transportation vehicle having one or more easily connectable modules and having an accessible floor.

The accessible public articulated transportation vehicle of present invention may comprise one or more power drive units which might be positioned at main body of accessible public articulated transportation vehicle, or in one or more modules of accessible public articulated transportation vehicle.

The accessible public articulated transportation vehicle of present invention may comprise one or more foldable or slidable doors, positioned at the end of the main body of the accessible public articulated transportation vehicle or at the end and/or front of the accessible public articulated transportation vehicle modules.

The modules of the accessible public articulated transportation vehicle are releasably connected to each other and to the the main body of the accessible public articulated transportation vehicle.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings are not intended to be drawn to scale. In the drawings, each identical or similar component that is illustrated in various figures is represented by a like numeral. For purposes of clarity, not every component may be labeled or act identified in every drawing.

In the drawings:

Fig.1 is an isometric view of a prior art of the present invention.

Fig.2 is a side view of one embodiment of a modular articulated public vehicle of present invention.

Fig. 3 is a side view of another embodiment of modular articulated public vehicle of present invention.

Fig.4 is a side view of yet another embodiment of modular articulated public vehicle of present invention.

Fig.5 is a top view of a coupling means of modular articulated public vehicle of present invention.

Fig.6 is a top view of a connection means of modular articulated public vehicle of present invention.

Fig.7 is a cross section view of a modular articulated public vehicle of present invention.

Fig.8 is a cross section view of another embodiment of modular articulated public vehicle of present invention.

Fig.9 is a cross section view of yet another embodiment of modular articulated public vehicle of present invention.

Fig.10 is a cross section view of yet another embodiment of modular articulated public vehicle of present invention showing the location of the foldable door.

Fig.11 is a rear view of yet another embodiment of modular articulated public vehicle of present invention showing the location of the foldable door.

Fig.12 is a top view of yet another embodiment of modular articulated public vehicle of present invention showing the location of the foldable door.

Fig.13 is a cross section view of yet another embodiment of modular articulated public vehicle of present invention showing the location of the power drive unit.

Fig.14 is a top view of yet another embodiment of modular articulated public vehicle of present invention showing the location of the power drive unit.

DETAILED DESCRIPTION OF PREFFERED EMBODIMENTS

Fig. 1 shows an exemplary view of a prior art articulated transportation vehicle (1).

Modular articulated public transportation vehicle having improved accessibility means a vehicle having accessible floor for regular and disabled passengers. Said accessible floor may comprise one or more elevated surfaces (27) for the whole length of the vehicle or part of it. Said elevated surfaces (27) may be at substantially the same height as the surface (28) (or floor) of vehicle's station (i.e. height that allows passengers comfortable leaving/boarding of/on the vehicle to/from vehicle's station surface (28)). Said elevated surfaces (27) may comprise one or more ramps (29) which facilitate leaving and loading of passengers from/on said vehicle ,said ramps (29) might be movable or foldable (either manually, or electrically, or pneumatically, or hydraulically) in one, or two, or three dimensions. Also said ramps (29) might be flat or inclined.

In another embodiment of present invention, modular articulated public transportation vehicle having improved accessibility means a vehicle having height adjustable suspension system (30) which allows to vary vehicle's floor height from ground, in order to be at substantially the same height as the surface (28) (or floor) of vehicle's station .

Fig 2. shows an exemplary view of the present invention. The articulated modular transportation vehicle having improved accessibility (2) of present invention (it is well known to those skilled in the art that there exists many kinds and varieties of articulated transportation vehicles having improved accessibility. Present invention relates to all articulated public transportation vehicles having improved accessibility, including but not limited to fuel, biofuel, gas, hydrogen, electricity or compressed air driven vehicles *mutatis mutandis*. For example, such articulated public transportation vehicles having improved accessibility

might be (but not limited to): omnibus, bus, double-decker bus, trolleybus, tram, light rail train, rail train, magnetic train, etc.) comprises a main body (3) releasably coupled via articulation mechanism (6) and bellows (5) to the modules (4). As will be appreciated by those skilled in the art, that although Fig.2 features only two modules (4), the present invention may comprise one or more additional modules (4), releasably coupled to each other via additional articulation mechanism (6) and bellows (5), and wherein first module (4) of plurality of additional modules (4) releasably coupled in his turn to the main body (3).

The module (4) may comprise one pair or more of single wheels or double wheels (7), in case wherein module (4) comprises only one axle having one pair (or more) of wheels, module (4) also comprises retractable supporting means, which could be implemented in the form of retractable pole or leg (20).

The articulated modular transportation vehicle having improved accessibility (2) of present invention may be powered by different power sources, as was mentioned earlier. Each power source requires suitable power drive unit (32a-32e) (that might be, but not limited to: internal combustion engine (including diesel engine), electric engine, etc.).

In one embodiment of the present invention, suitable power drive unit (32a) is located only in the main body (3), in a position that does not increases the height of the floor of the main body (for example the power drive unit (32b) may be located on the side of main body (3)).

In another embodiment of present invention the power drive unit (32d,32e) is located only in the last module (4) of the articulated modular transportation vehicle (2).

In yet another embodiment of the present invention, the power drive unit is located in all or in limited number of modules (4) of present invention in a position that does not increases the height of the floor of the modules

(4), for example the power drive unit may be located on the side of the modules (4). Additionally, power drive unit may be located in the main body (3) of the articulated modular transportation vehicle (2).

In yet another embodiment of the present invention a rear door (31a-31f) is positioned at the rear end (12) of the main body (3) and at the rear end (11) or front end (10) of the module (4), said rear door might be a sliding door (for example of sliding door see US4948157, which is incorporated herein by reference) or foldable door as it is known in the art.

In one more embodiment of present invention, shown in Fig. 2, the bellows (5) comprise a releasable first connection means (13) positioned on its front end (8) and capable of joining with suitably adapted second releasable connections means (14) positioned on the rear end (12) of the main body (3). On its rear end (9) the bellows are firmly connected to the front end (10) of the module (4).

In another embodiment of present invention, shown in Fig.4, the bellows (5) are firmly connected on its front end (8) to the rear end (11) of module (4) and on its rear end (9) the bellows (5) are releasably connected, via third releasable connection means (21) (which may be identical to the first releasable connection means(13)) to the front end (10) of additional module (4) having suitably adapted fourth connections means (22), which may be identical to the second connection means(14) .

In yet another embodiment of present invention, shown in Fig.3, the bellows (5) comprise front part (15) and rear part (16) releasably connected between themselves by using adapted fifth releasable connection means (19a, 19b) (effectively forming bellows having releasable connection means in the middle (17)) and firmly connected by its front end (8) and rear end (9) to the rear end (12) and to the front end (10) of the main body (3) and module (4) respectfully.

Said releasable connection means (13,14,19,21,22) may be of male/female connection type, which might be activated (via operating locking mechanism (18)) either manually, or electrically, or pneumatically, or hydraulically; locally or from remote location (via remote control) inside or outside the vehicle (2).
Moreover, said connection means (13,14,19,21,22) could be of any other suitable connection type which is known in the art.

Furthermore, the bellows (5) may be of a foldable or of a retractable kind as it is known in the art .

In yet another embodiment of present invention an articulation mechanism (6) is firmly coupled to the front end (10) of the module (4) and releasably coupled (in present invention, releasably coupled means using releasable coupling means that might be any kind of suitable or adapted coupling known in the art that allows rotation, such as male/female, ball type (see for example US6540426 which is incorporated herein by reference) or any other releasable coupling) to a rear end (12) of the main body (3).

In yet another embodiment of present invention an articulation mechanism (6) is firmly coupled to the rear end (12) of the main body and releasably coupled to the front end (10) of the module (4).

In yet another embodiment of the present invention an articulation mechanism (6) comprises rear (23) and front (24) parts, front part is firmly coupled to the rear end (12) of the main body (3) and the rear part is firmly coupled to the front end (10) of the module (4) and said two parts are releasably coupled together.

Said releasable coupling means (26a, 26b) of articulation mechanism (6) of present invention may comprise releasable coupling means which might be activated (via operating locking mechanism (25)) either manually, or electrically or, pneumatically or hydraulically; locally or from

remote location location (via remote control) inside or outside the vehicle (2).

The articulated modular transportation vehicle having improved accessibility of the present invention may comprise, as was mentioned earlier, one or more modules (4) releasably coupled to the main body (3). The coupling/decoupling of modules (4) from the main body (3) and from each other is achieved by activation of suitable releasable connection (13,14,19,22,23) of bellows (5) and of releasable coupling means (26) of articulation mechanism (6) by designated person, a driver for example.

Although the embodiments of present invention describe bellows (5) and articulation mechanism (6) attached between rear end (12) of the main body (3) and the front end (10) of the first module (4), it will be appreciated by those skilled in the art that said attachment could be accomplished mutatis mutandis between any two successive modules (4) of present invention.

Yet another variation of the present invention is a known articulated public vehicle having improved accessibility modificated to form articulated modular transportation vehicle having improved accessibility of present invention. Said modification could be performed by attaching articulation mechanism (6), bellows (5) and connection means (13,14,19,21,22) of present invention to the main body and modules of existing articulated public vehicle having improved accessibility.

The connection of the control and supply lines (electric, pneumatic, hydraulic, etc.) between main body (3) and the module (4) or between modules (4), is by way of quick release couplings which are not shown in the figures.

The following sections provide a guide to interpreting the present application.

The terms "an embodiment", "embodiment", "embodiments", "the embodiment", "the embodiments", "one or more embodiments", "some embodiments", "certain embodiments", "one embodiment", "another embodiment" and the like mean "one or more (but not all) embodiments of the disclosed invention", unless expressly specified otherwise.

The term "variation" of an invention means an embodiment of the invention, unless expressly specified otherwise. A reference to "another embodiment" in describing an embodiment does not imply that the referenced embodiment is mutually exclusive with another embodiment (e.g., an embodiment described before the referenced embodiment), unless expressly specified otherwise. The terms "including", "having", "comprising" and variations thereof mean "including but not limited to", unless expressly specified otherwise. The terms "a", "an" and "the" mean "one or more", unless expressly specified otherwise. The term "plurality" means "two or more", unless expressly specified otherwise.

The term "herein" means "in this patent application, including anything which may be incorporated by reference", unless expressly specified otherwise. The phrase "at least one of", when such phrase modifies a plurality of things (such as an enumerated list of things) means any combination of one or more of those things, unless expressly specified otherwise.

Where a limitation of a first claim would cover one of a feature as well as more than one of a feature (e.g., a limitation such as "at least one module" covers one module as well as more than one module), and where in a second claim that depends on the first claim, the second claim uses a definite article "the" to refer to the limitation (e.g., "the module"), this does not imply that the first claim covers only one of the feature, and this does not imply that the second claim covers only one of the feature (e.g., "the module" can cover both one module and more than one module).

When an ordinal number (such as "first", "second", "third" and so on) is used as an adjective before a term, that ordinal number is used (unless expressly specified otherwise) merely to indicate a particular feature, such as to distinguish that particular feature from another feature that is described by the same term or by a similar term. For example, the mere usage of the ordinal numbers "first" and "second" before the term "module" does not indicate that there must be no more than two modules.

When a single device or article is described herein, more than one device/article (whether or not they cooperate) may alternatively be used in place of the single device/article that is described. Accordingly, the functionality that is described as being possessed by a device may alternatively be possessed by more than one device/article (whether or not they cooperate).

Similarly, where more than one device or article is described herein (whether or not they cooperate), a single device/article may alternatively be used in place of the more than one device or article that is described.

The functionality and/or the features of a single device that is described may be alternatively embodied by one or more other devices which are described but are not explicitly described as having such functionality/features. Thus, other embodiments need not include the described device itself, but rather can include the one or more other devices which would, in those other embodiments, have such functionality/features.

Numerous embodiments are described in this patent application, and are presented for illustrative purposes only. The described embodiments are not, and are not intended to be, limiting in any sense. The presently disclosed invention are widely applicable to numerous embodiments, as is readily apparent from the disclosure. One of ordinary skill in the art will recognize that the disclosed invention may be practiced with various

modifications and alterations. Although particular features of the disclosed invention may be described with reference to one or more particular embodiments and/or drawings, it should be understood that such features are not limited to usage in the one or more particular embodiments or drawings with reference to which they are described, unless expressly specified otherwise.

The present disclosure is neither a literal description of all embodiments of the invention nor a listing of features of the invention which must be present in all embodiments.

A description of an embodiment with several components or features does not imply that all or even any of such components/features are required. On the contrary, a variety of optional components are described to illustrate the wide variety of possible embodiments of the present invention. Unless otherwise specified explicitly, no component/feature is essential or required.

Although process steps or the like may be described in a sequential order, such processes may be configured to work in different orders. In other words, any sequence or order of steps that may be explicitly described does not necessarily indicate a requirement that the steps be performed in that order. The steps of processes described herein may be performed in any order practical. Further, some steps may be performed simultaneously despite being described or implied as occurring non-simultaneously (e.g., because one step is described after the other step).

Although a process may be described as including a plurality of steps, that does not imply that all or any of the steps are essential or required. Various other embodiments within the scope of the described invention(s) include other processes that omit some or all of the described steps. Unless otherwise specified explicitly, no step is essential or required.

An enumerated list of items (which may or may not be numbered) does not imply that any or all of the items are mutually exclusive, unless expressly specified otherwise. Likewise, an enumerated list of items (which may or may not be numbered) does not imply that any or all of the items are comprehensive of any category, unless expressly specified otherwise.

Numerous references to a particular embodiment does not indicate a disclaimer or disavowal of additional, different embodiments, and similarly references to the description of embodiments which all include a particular feature does not indicate a disclaimer or disavowal of embodiments which do not include that particular feature.

Any patent, patent application or other document referred to herein is incorporated by reference into this patent application as part of the present disclosure, but only for purposes of written description and should in no way be used to limit, define, or otherwise construe any term of the present application where the present application, without such incorporation by reference, would not have failed to provide an ascertainable meaning, but rather would have allowed an ascertainable meaning for such term to be provided. Thus, the person of ordinary skill in the art need not have been in any way limited by any embodiments provided in the reference.

Any incorporation by reference does not, in and of itself, imply any endorsement of, ratification of or acquiescence in any statements, opinions, arguments or characterizations contained in any incorporated patent, patent application or other document, unless explicitly specified otherwise in this patent application.

Having thus described several aspects of at least one embodiment of this invention, it is to be appreciated various alterations, modifications, and improvements will readily occur to those skilled in the art. Such alterations, modifications, and improvements are intended to be part of

this disclosure, and are intended to be within the scope of instant invention. Accordingly, the foregoing description and drawings are by way of example only.

CLAIMS:

1. An articulated modular transportation vehicle having accessible floor and comprising:
   a. a main body;
   b. at least one module, adapted to be releasably coupled to said main body.

2. An articulated modular transportation vehicle according to claim 1, further comprising bellows, releasably connected to said main body and firmly connected to said module.

3. An articulated modular transportation vehicle according to claim 2, further comprising plurality of releasable connection means attached to said bellows and to said main body.

4. An articulated modular transportation vehicle according to claim 1, further comprising bellows, firmly connected to said main body and releasably connected to said module.

5. An articulated modular transportation vehicle according to claim 4, further comprising plurality of releasable connection means attached to said bellows and to said module.

6. An articulated modular transportation vehicle according to claim 1, further comprising bellows having front and rear parts, said front part is firmly connected to said main body and said rear part is firmly connected to said module, and said front part is releasably connected to said rear part.

7. An articulated modular transportation vehicle according to claim 6, further comprising plurality of releasable connection means attached to said front and rear parts of said bellows.

8. An articulated modular transportation vehicle according to any one of claims 3, 5, 7, further comprising locking mechanism adapted to activate said releasable connection means from locking position to unlocked and vice versa.

9. An articulated modular transportation vehicle according to claim 8, wherein said locking mechanism is adapted to be manually operated.

10. An articulated modular transportation vehicle according to claim 8, wherein said locking mechanism is adapted to be electrically operated.

11. An articulated modular transportation vehicle according to claim 8, wherein said locking mechanism is adapted to be pneumatically operated.

12. An low floor articulated modular transportation vehicle according to claim 8, wherein said locking mechanism is adapted to be hydraulically operated.

13. An articulated modular transportation vehicle according to any one of the claims 8 to 12, wherein said locking mechanism is adapted to be operated locally.

14. An articulated modular transportation vehicle according to any one of the claims 8 to 12, wherein said locking mechanism is adapted to be operated remotely.

15. An articulated modular transportation vehicle according to one of the claims 3,5,7, 8 to 14, wherein said plurality of releasable connection means are male/female connection means.

16. An articulated modular transportation vehicle according to any one of the previous claims, further comprising an articulation mechanism,

firmly coupled to said main body and releasably coupled to said module.

17. An articulated modular transportation vehicle according to any one of the claims 1 to 15, further comprising an articulation mechanism, releasably coupled to said main body and firmly coupled to said module.

18. An articulated modular transportation vehicle according to any one of the claims 1 to 15, further comprising an articulation mechanism having front and rear parts, said front part is firmly coupled to said main body and said rear part is firmly coupled to said module, and said front part is releasably coupled to said rear part.

19. An articulated modular transportation vehicle according to any one of the claims 16 to 18, wherein said articulation mechanism is a rotatable articulation mechanism.

20. An articulated modular transportation vehicle according to any one of the claims 16 to 19, further comprising releasable coupling means attached to said articulation mechanism.

21. An articulated modular transportation vehicle according to claim 20, further comprising locking mechanism adapted to activate said releasable coupling means from locking position to unlocked and vice versa.

22. An articulated modular transportation vehicle according to claim 21, wherein said locking mechanism is adapted to be manually operated.

23. An articulated modular transportation vehicle according to claim 21, wherein said locking mechanism is adapted to be electrically operated.

24. An articulated modular transportation vehicle according to claim 21, wherein said locking mechanism is adapted to be pneumatically operated.

25. An articulated modular transportation vehicle according to claim 21, wherein said locking mechanism is adapted to be hydraulically operated.

26. An articulated modular transportation vehicle according to any one of the claims 21 to 25, wherein said locking mechanism is adapted to be operated locally.

27. An articulated modular transportation vehicle according to any one of the claims 21 to 25, wherein said locking mechanism is adapted to be operated remotely.

28. An articulated modular transportation vehicle according to any one of claims 20 to 27, wherein said releasable coupling means are male/female releasable coupling means.

29. An articulated modular transportation vehicle according to any one of claims 20 to 27, wherein said releasable coupling means are ball type releasable coupling means.

30. An articulated modular transportation vehicle having accessible floor and comprising:

a. a main body;

b. plurality of successive modules, wherein said modules are adapted to be releasably coupled to said main body and to each other.

31. An articulated modular transportation vehicle according to claim 30, further comprising bellows, releasably connected to the first of two successive modules and firmly connected to the second module of said two successive modules .

32. An articulated modular transportation vehicle according to claim 31, further comprising plurality of releasable connection means attached to said bellows and to first of two successive modules.

33. An articulated modular transportation vehicle according to claim 30, further comprising bellows, firmly connected to the first of two successive modules and releasably connected to the second module of said two successive modules .

34. An articulated modular transportation vehicle according to claim 33, further comprising plurality of releasable connection means attached to said bellows and to second module of said two successive modules.

35. An articulated modular transportation vehicle according to claim 30, further comprising bellows having front and rear parts, said front part is firmly connected to the first of two successive modules and said rear part is firmly connected to the second module of said two successive modules, and said front part is releasably connected to said rear part.

36. An articulated modular transportation vehicle according to claim 35, further comprising plurality of releasable connection means attached to said front and rear parts of said bellows.

37. An articulated modular transportation vehicle according to any one of claims 32, 34, 36, further comprising locking mechanism adapted to activate said releasable connection means from locking position to unlocked and vice versa.

38. An articulated modular transportation vehicle according to claim 37, wherein said locking mechanism is adapted to be manually operated.

39. An articulated modular transportation vehicle according to claim 37, wherein said locking mechanism is adapted to be electrically operated.

40. An articulated modular transportation vehicle according to claim 37, wherein said locking mechanism is adapted to be pneumatically operated.

41. An articulated modular transportation vehicle according to claim 37, wherein said locking mechanism is adapted to be hydraulically operated.

42. An articulated modular transportation vehicle according to any one of the claims 37 to 41, wherein said locking mechanism is adapted to be operated locally.

43. An articulated modular transportation vehicle according to any one of the claims 37 to 41, wherein said locking mechanism is adapted to be operated remotely.

44. An articulated modular transportation vehicle according to one of the claims 32, 34, 36 to 43, wherein said plurality of releasable connection means are male/female connection means.

45. An articulated modular transportation vehicle according to any one of the claims 30 to 44, further comprising an articulation mechanism, firmly coupled to the first of two successive modules and releasably coupled to the second module of said two successive modules.

46. An articulated modular transportation vehicle according to any one of the claims 30 to 44, further comprising an articulation mechanism, releasably coupled to the first of two successive modules and firmly coupled to the second module of said two successive modules.

47. An articulated modular transportation vehicle according to any one of the claims 30 to 44, further comprising an articulation mechanism having front and rear parts, said front part is firmly coupled to the first of two successive modules and said rear part is firmly coupled to the second module of said two successive modules, and said front part is releasably coupled to said rear part.

48. An articulated modular transportation vehicle according to any one of the claims 45 to 47, wherein said articulation mechanism is a rotatable articulation mechanism.

49. An articulated modular transportation vehicle according to any one of the claims 45 to 48, further comprising releasable coupling means attached to said articulation mechanism.

50. An articulated modular transportation vehicle according to claim 49, further comprising locking mechanism adapted to activate said releasable coupling means from locking position to unlocked and vice versa.

51. An articulated modular transportation vehicle according to claim 50, wherein said locking mechanism is adapted to be manually operated.

52. An articulated modular transportation vehicle according to claim 50, wherein said locking mechanism is adapted to be electrically operated.

53. An articulated modular transportation vehicle according to claim 50, wherein said locking mechanism is adapted to be pneumatically operated.

54. An articulated modular transportation vehicle according to claim 50, wherein said locking mechanism is adapted to be hydraulically operated.

55. An articulated modular transportation vehicle according to any one of the claims 50 to 54, wherein said locking mechanism is adapted to be operated locally.

56. An articulated modular transportation vehicle according to any one of the claims 50 to 54, wherein said locking mechanism is adapted to be operated remotely.

57. An articulated modular transportation vehicle according to any one of claims 49 to 56, wherein said releasable coupling means are male/female releasable coupling means.

58. An articulated modular transportation vehicle according to any one of claims 49 to 56, wherein said releasable coupling means are ball type releasable coupling means.

59. An articulated modular transportation vehicle according to any one of the previous claims, further comprising power drive unit, which is attached to said main body.

60. An articulated modular transportation vehicle according to any one of claims 1 to 58, further comprising power drive unit which is attached to the last module.

61. An articulated modular transportation vehicle according to any one of claims 1 to 58, further comprising at least one power drive unit, each said power drive unit is attached to at least one of the said modules.

62. An articulated modular transportation vehicle according to any one of claims 1 to 58, further comprising plurality of power drive units, and said plurality of power drive units are attached to at least one of the said modules and optionally attached to said main body.

63. An articulated modular transportation vehicle according to any one of claims 59 to 62, wherein said power drive unit is an internal combustion engine.

64. An articulated modular transportation vehicle according to any one of claims 59 to 62, wherein said power drive unit is a diesel engine.

65. An articulated modular transportation vehicle according to any one of claims 59 to 62, wherein said power drive unit is an electric engine.

66. An articulated modular transportation vehicle according to any one of the previous claims, further comprising rear door positioned at the rear end of said main body and at the rear end of said modules.

67. An articulated modular transportation vehicle according to claim 66, wherein said rear door is a sliding door.

68. An articulated modular transportation vehicle according to claim 37, wherein said rear door is a foldable door.

69. An articulated modular transportation vehicle according to any one of the previous claims, wherein said module comprises at least one pair of wheels attached to the said module.

70. An articulated modular transportation vehicle according to any one of the claims 1 to 68, wherein said module comprises one pair of single or double wheels attached to the said module and at least one retractable support means attached to the said module.

71. An articulated modular transportation vehicle according to any one of the previous claims, wherein said articulated modular transportation vehicle is an omnibus.

72. An articulated modular transportation vehicle according to any one of the claims 1 to 70, wherein said articulated modular transportation vehicle is a bus.

73. An articulated modular transportation vehicle according to any one of the claims 1 to 70, wherein said articulated modular transportation vehicle is a double-decker bus.

74. An articulated modular transportation vehicle according to any one of the claims 1 to 70, wherein said articulated modular transportation vehicle is a trolleybus.

75. An articulated modular transportation vehicle according to any one of the claims 1 to 70, wherein said articulated modular transportation vehicle is a tram.

76. An articulated modular transportation vehicle according to any one of the claims 1 to 70, wherein said articulated modular transportation vehicle is a light rail train.

77. An articulated modular transportation vehicle according to any one of the claims 1 to 70, wherein said articulated modular transportation vehicle is a light rail train.

78. An articulated modular transportation vehicle according to any one of the claims 1 to 70, wherein said articulated modular transportation vehicle is a magnetic train.

79. Method of transforming an articulated transportation vehicle having accessible floor into articulated modular transportation vehicle having accessible floor, comprising:
    a. disconnecting a main body of said articulated transportation vehicle from its' modules;
    b. disconnecting said modules of said articulated transportation vehicle from each other;
    c. attaching bellows having releasable connection means to said main body and to said modules;
    d. attaching articulation mechanism having releasable coupling means to said main body and to said modules.

80. Use of articulated modular transportation vehicle having accessible floor, comprising step of releasably connecting first module to the main body .

81. Use of articulated modular transportation vehicle according to claim 80, further comprising releasably connecting plurality of successive modules between themselves and releasably connecting said successive modules to said first module.

82. An articulated modular transportation vehicle according to any of the claims 1 to 78, wherein said accessible floor comprise one or more elevated surfaces for the whole length of the vehicle or part of it.

83. An articulated modular transportation vehicle according to claim 82, wherein said elevated surfaces having height substantially as high as height of the vehicle's station surface.

84. An articulated modular transportation vehicle according to claim 82 or 83 wherein said elevated surfaces comprise one or more movable or foldable ramps.

85. An articulated modular transportation vehicle according to claim 84 wherein said one or more ramps are flat.

86. An articulated modular transportation vehicle according to claim 84 wherein said one or more ramps are inclined.

87. An articulated modular transportation vehicle according to any of the claims 1 to 78 or 82 to 86, having height adjustable suspension system.

88. An articulated modular transportation vehicle according to any of the claims 1 to 78 or 82 to 86, substantially as shown in the figures and as described in a specification.

89. Use of articulated modular transportation vehicle according to claims 80 or 81, substantially as shown in the figures and as described in a specification.

90. Method of transforming an articulated transportation vehicle into articulated modular transportation vehicle according to claim 79, substantially as shown in the figures and as described in a specification.

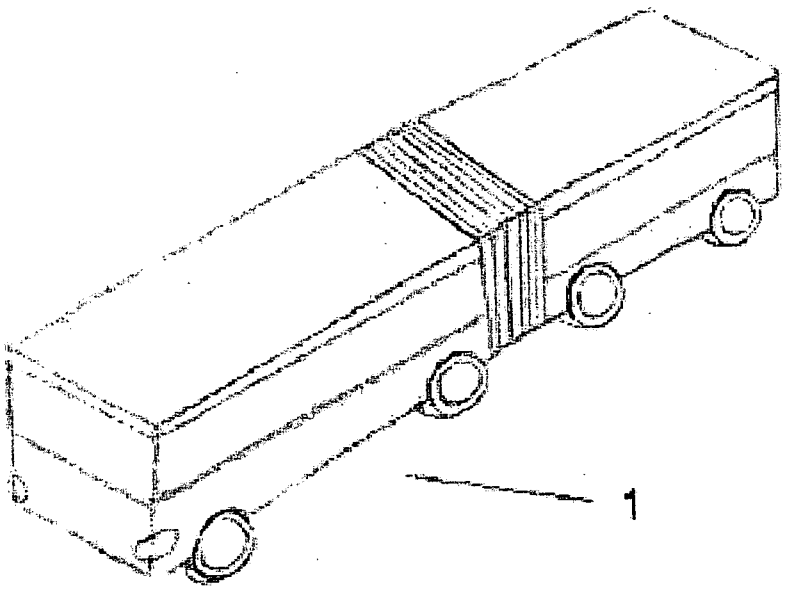


Fig. 1

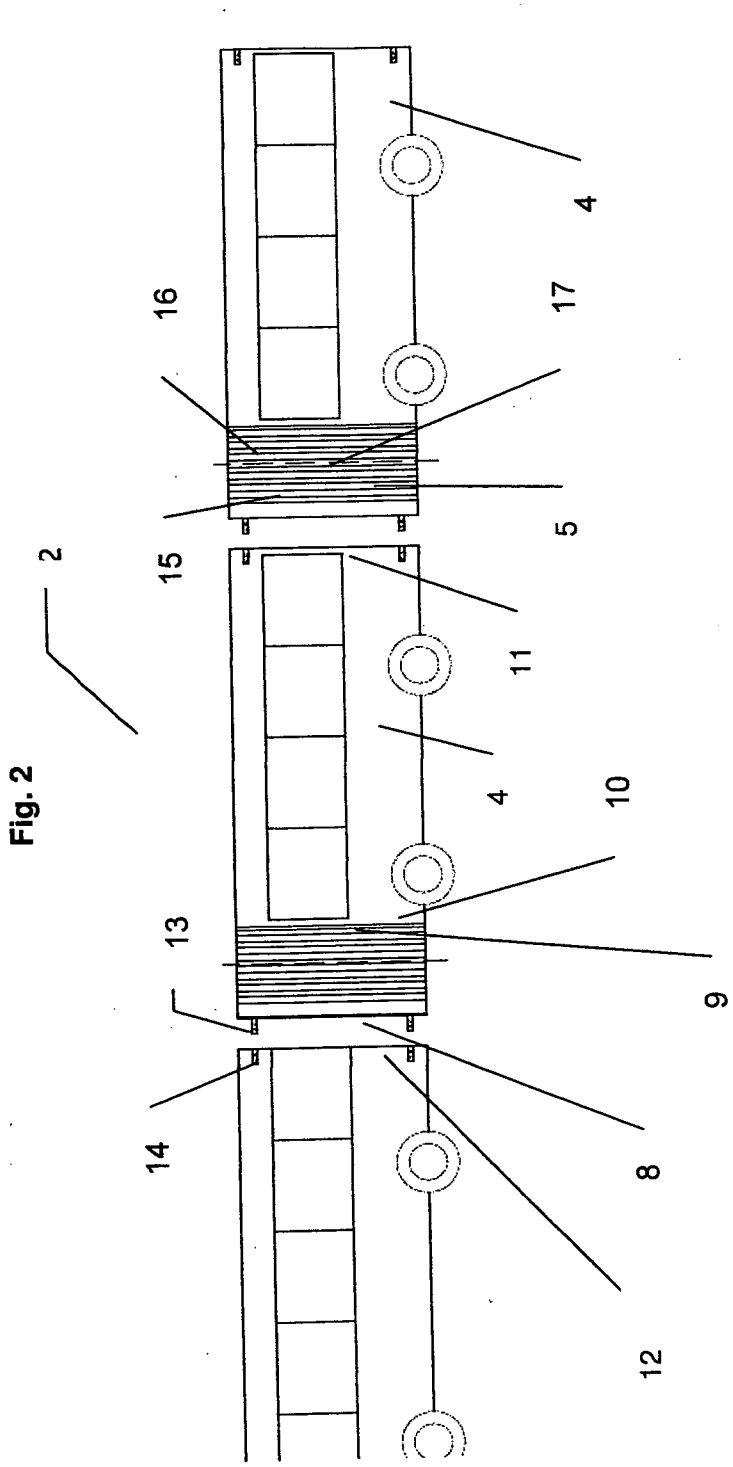


Fig. 2

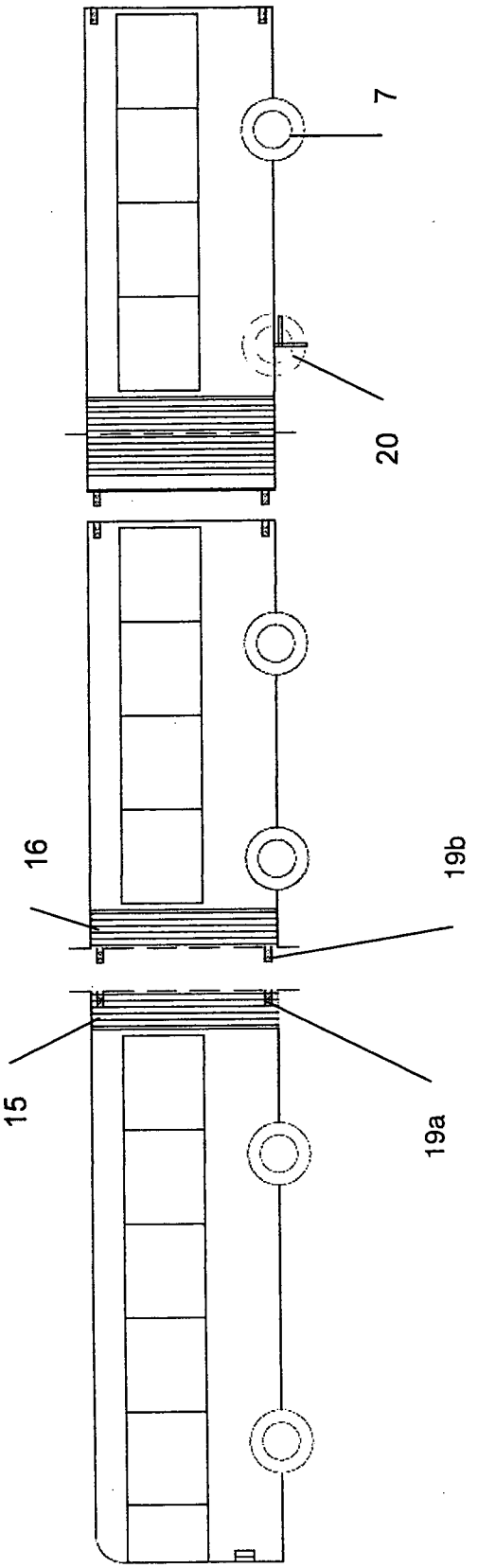


Fig. 3

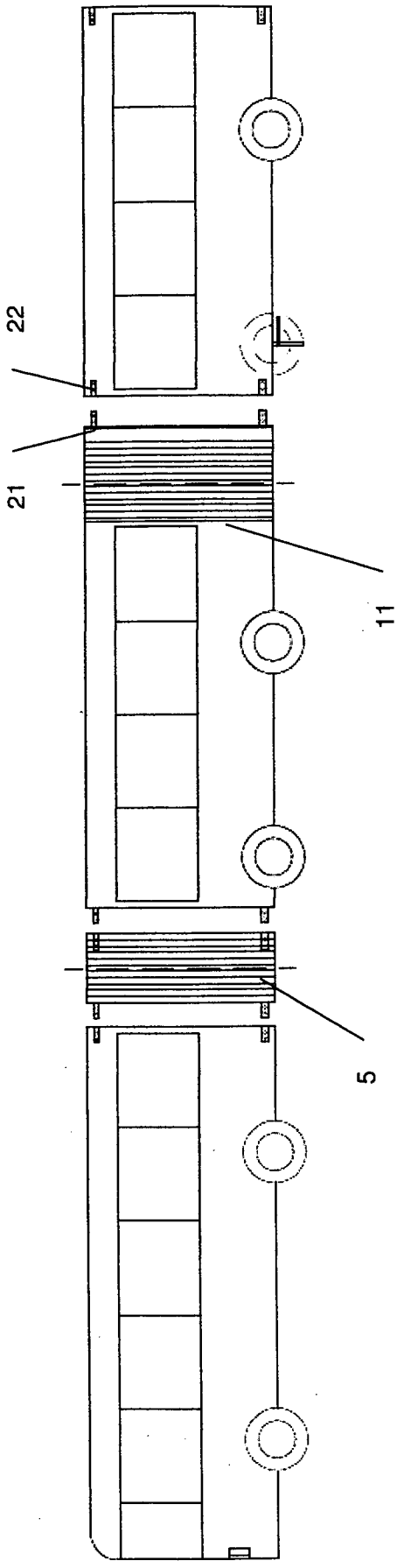


Fig. 4

Fig. 5

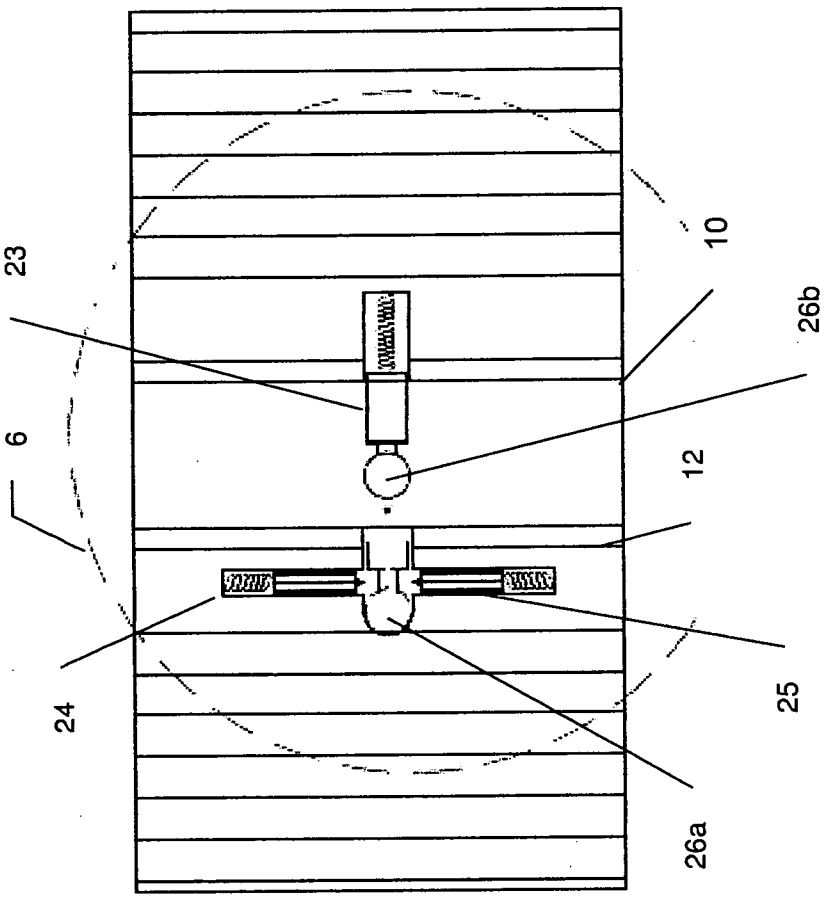
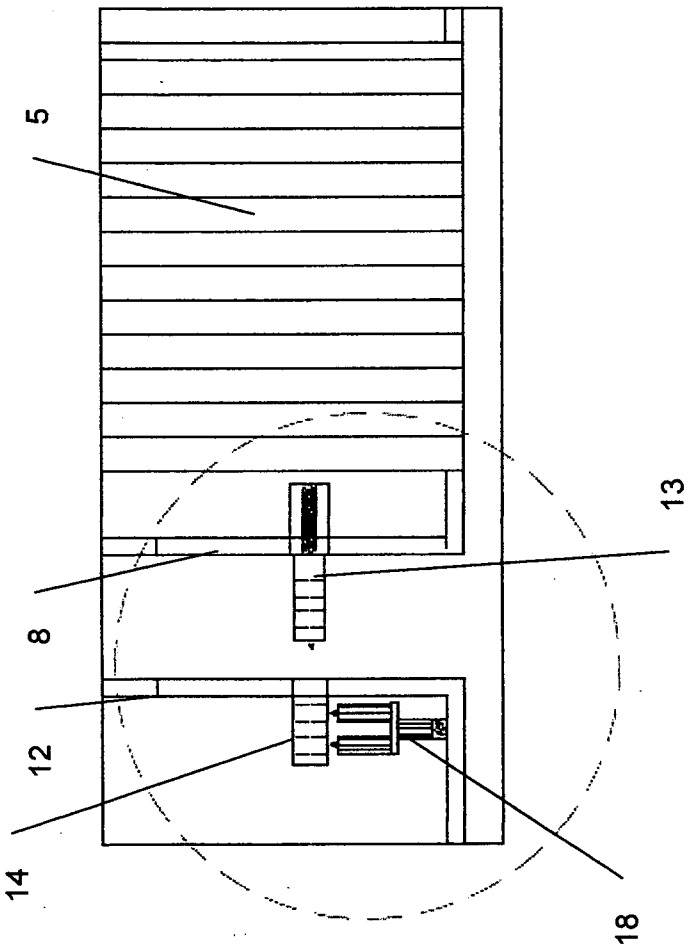


Fig. 6



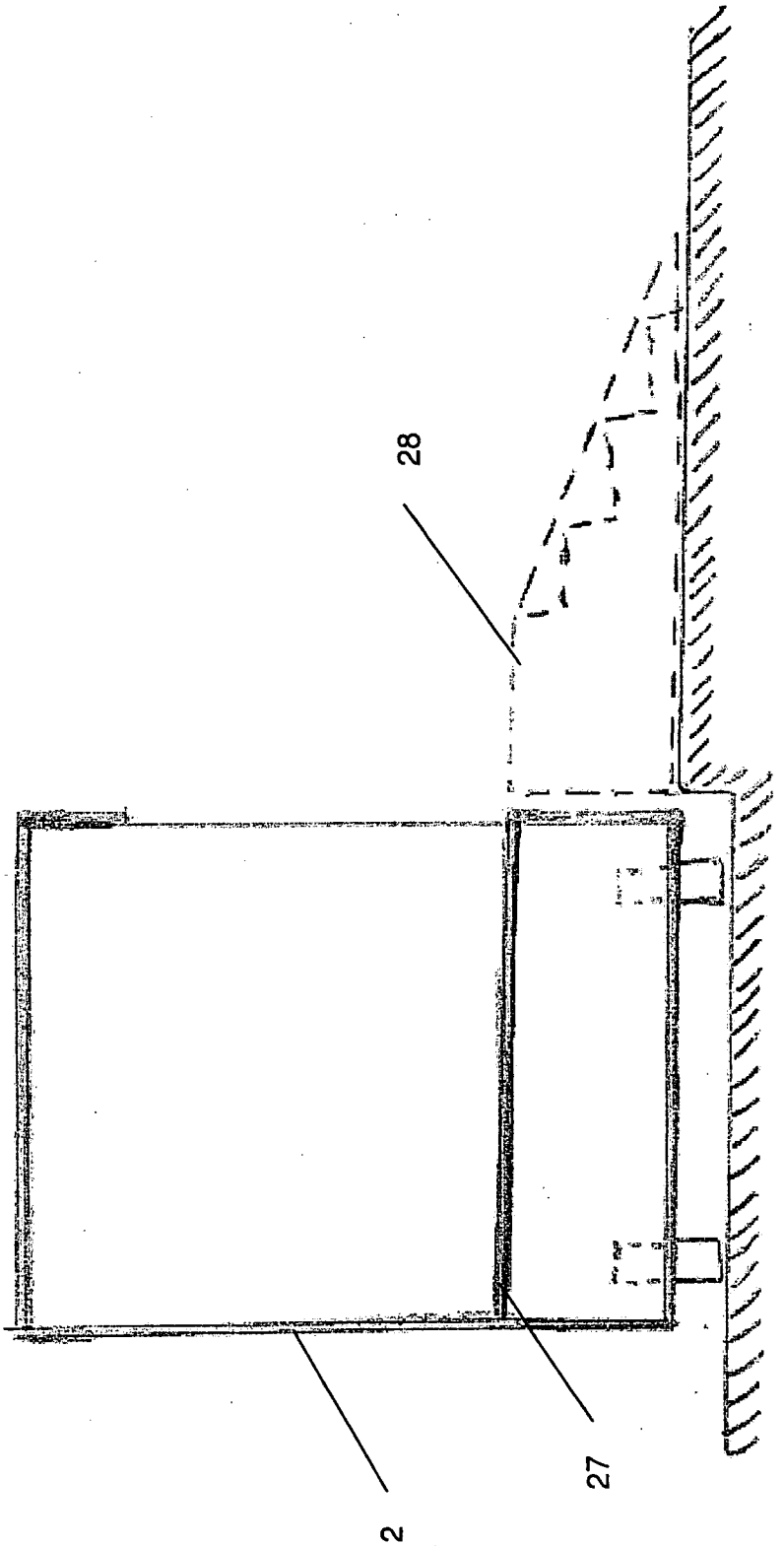


Fig. 7

Fig. 8

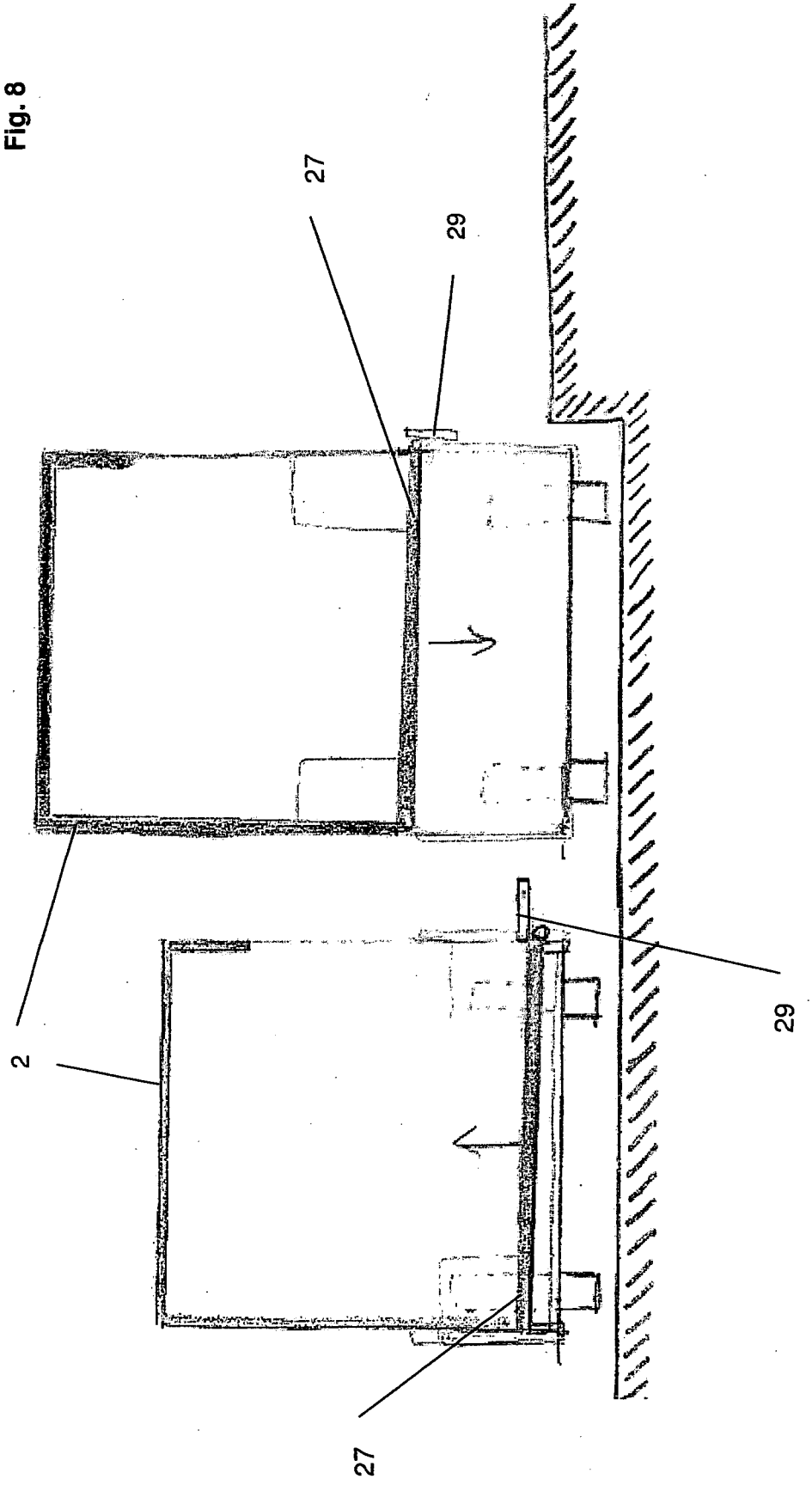
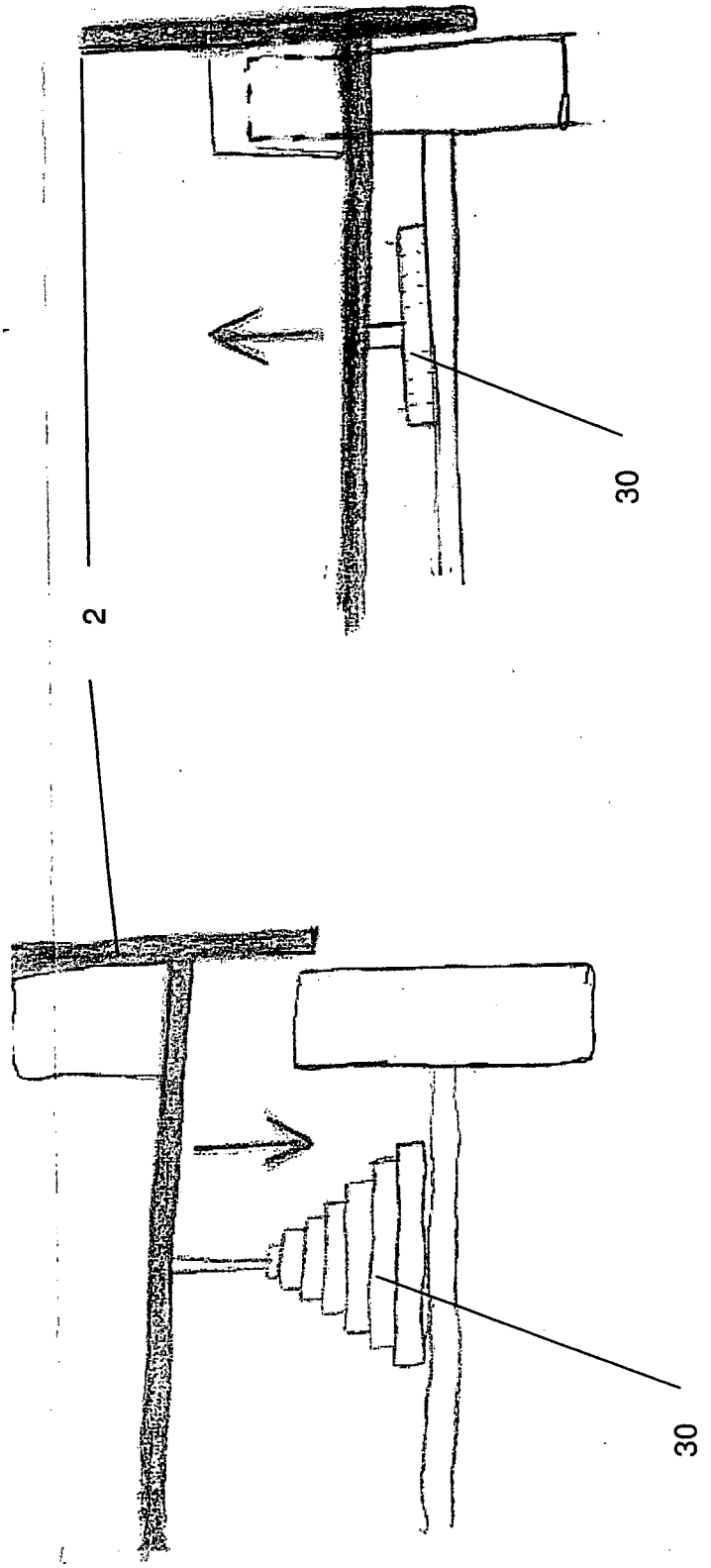


Fig. 9



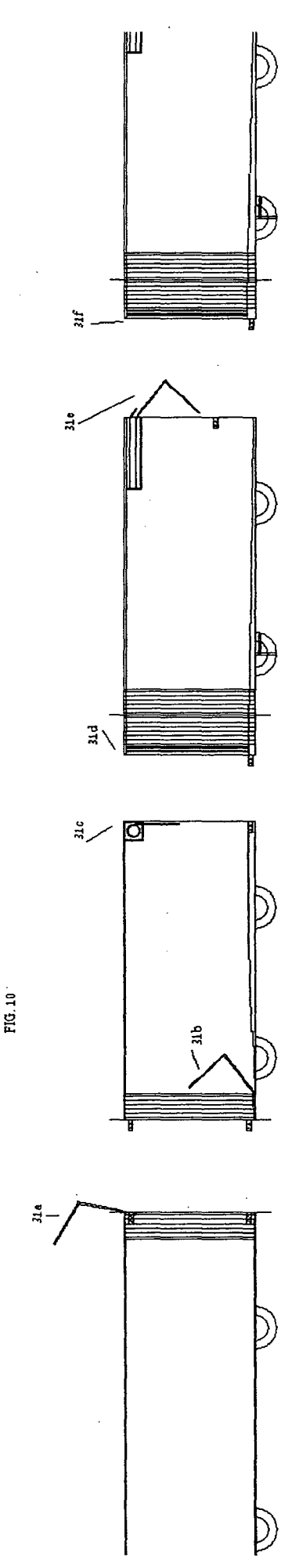


FIG. 10

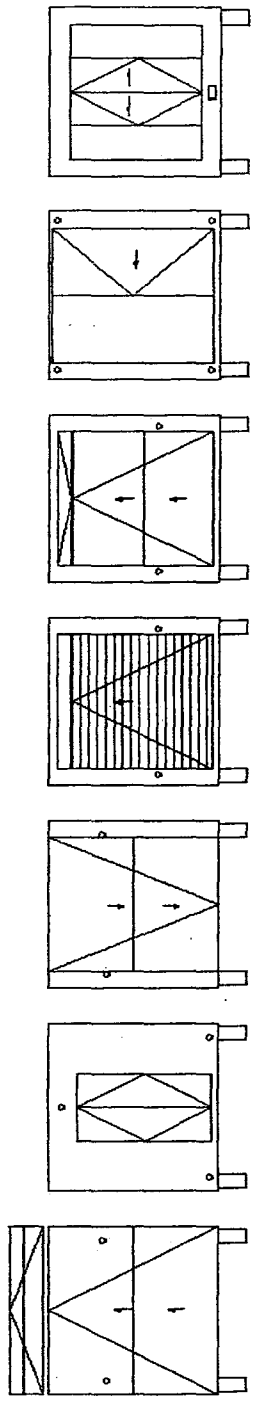


FIG. 11

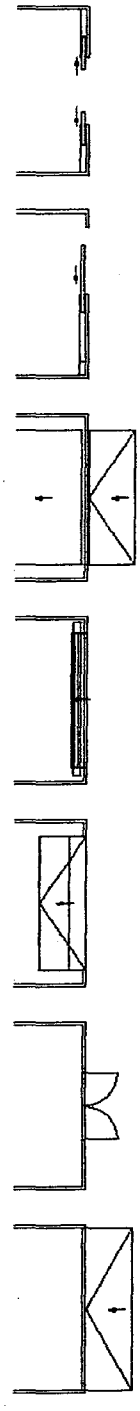


FIG. 12

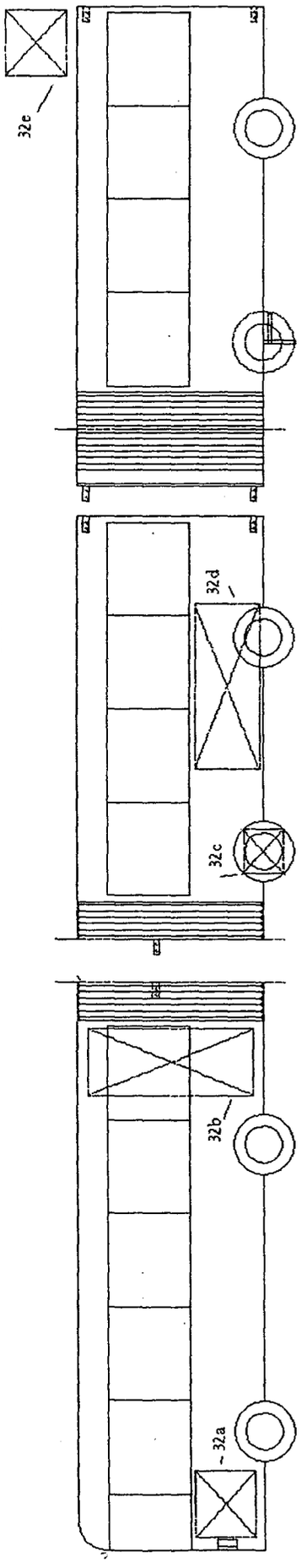


FIG. 13

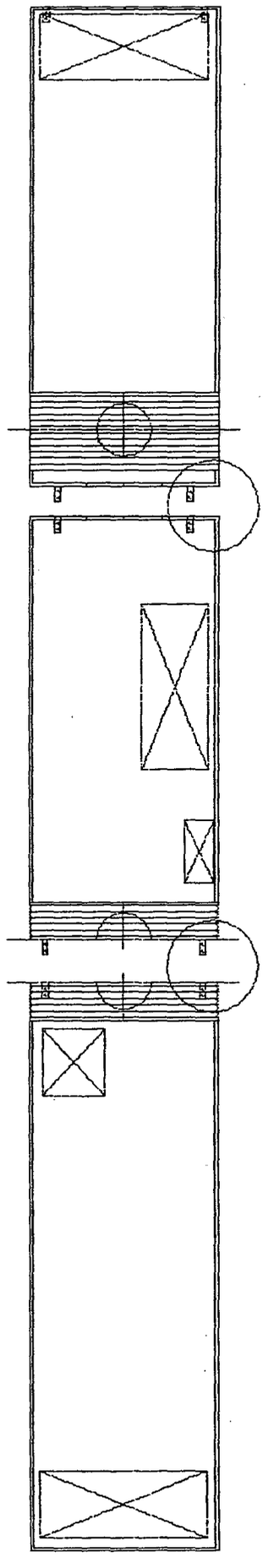


FIG. 14

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL 10/00603

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - B60P 3/34; B62C 1/06; B62D 33/08 (2010.01)
USPC - 296/26.08
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8): B60P 3/34; B62C 1/06; B62D 33/08 (2010.01)
USPC: 296/26.08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC(8): B60P 3/34; B62C 1/06; B62D 33/08 (2010.01); USPC: 296/178,26.0,26.08,26.09,26.1,26.11 - term limited

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Electronic Databases Searched: Google Scholar; Google Patent; PubWest (US Patents full-text, US PGPubs USOC, full-text, EPO Abstracts, and JPO Abstracts) Search Terms Used: public, vehicle, vehicles, transport, transportation, transporting, articulating, articulation, module, modules, coupling, coupled, bellows, connect, connecting, connection, et

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ----- Y	US 4,765,249 A (Ishizuka et al.) 23 August 1988 (23.08.1988), entire document, esp., col 1, ln 22 - col 2, ln 2; col 2, ln 60 - col 3, ln 7; col 4, ln 1-7; col 4, ln 17-35; col 5, ln 25-60; col 6, ln 23-27; fig 1, 7-12.	1-8, 10-12, 30-37, 39-41, 79-81 ---------- 9, 38, 68
Y	US 3,387,568 A (Hawes) 11 June 1968 (11.06.1968), entire document, esp., col 2, ln 31 - col 3, ln 2; fig 1,6.	9, 38
Y	US 3,911,831 A (BLUNDEN) 14 October 1975 (14.10.1975) Fig. 1; col 2, ln 36-60	68
A	US 2,208,626 A (BREER) 23 July 1940 (23.07.1940) entire document especially Fig. 1, Fig. 3, Fig. 5; col 2, ln 5-37; col 2, ln 52 to col 3, ln 2	1-12, 30-41, 68, 79-81
A	US 5,259,323 A (KOCH et al.) 09 November 1993 (09.11.1993) entire document generally	1-12, 30-41, 68, 79-81
A	US 5,953,997 A (ANDRE et al.) 21 September 1999 (21.09.1999) entire document generally	1-12, 30-41, 68, 79-81
A	US 5,033,395 A (Bechu et al.) 23 July 1991 (23.07.1991), entire document.	1-12, 30-41, 68, 79-81
A	US 5,546,866 A (Koch) 20 August 1996 (20.08.1996), entire document.	1-12, 30-41, 68, 79-81
A	US 6,926,344 B2 (Koch et al.) 9 August 2005 (09.08.2005), entire document.	1-12, 30-41, 68, 79-81

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
08 December 2010 (08.12.2010)	17 DEC 2010
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL 10/00603

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 89-90
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Claims 89 and 90 are omnibus type claims, not drafted in accordance with Rule 6.2(a).

3. ☒ Claims Nos.: 13-29, 42-67, 69-78, and 82-88
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.