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(54) URBAN TRANSPORTATION AND LOGISTICS SYSTEM

(57) The invention relates to transport and logistics systems of large cities, and may be used in construction of cities with population of over five hundred thousand people. The technical result of the proposed solution is to optimize the urban transport and logistics system, eliminate traffic congestions and ensure rapid movement to any point in the city. The urban transport and logistics system includes the first ground level for road and rail freight transport, the second level of pipeline and technical communications, the third level of passenger transport, the fourth pedestrian level, each level being located one above the other, and they are connected with each other and with residential and non-residential buildings by vertical staircase-elevator modulus.

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Description

Field of invention

[0001] The invention relates to transportation and logistics systems of large cities, and may be used in construction of cities with population of over five hundred thousand people.

Background of the invention

[0002] Modern urban development is characterized by emergence of urban transport crises associated with congestion, accidents, the average transport speed droop, environmental degradation, psychological stress, and decrease in the energy efficiency of transport.

[0003] A lot of inventors are working on solving these problems, for example, "URBAN TRANSPORT COMPLEX WITH A MULTIFUNCTIONAL ELEVATED STRUCTURE" is known from patent RU No. 73372 (priority of 20/05/2008). City transportation complex is disclosed, which includes the objects integrated into existing urban space with fully developed infrastructure that are not subject to demolition: buildings (for example, railway station buildings with arrival and departure halls, hotels, business and shopping centers), railway station forecourt with underground access highways, parking, expressway line or car overpass, pedestrian zones made in the form of covered footbridges and connected to the station platform for passengers, who is getting on/off, the pedestrian zones of covered footbridges are made in the form of at least one multi-purpose overpass located between buildings above access roads and the railway station forecourt, above the expressway and parking, while the multi-purpose overpass is mounted on supports from separate bulk modulus connected by fasteners, providing the option of modular addition both in the longitudinal and transverse directions, and equipped with staircase-elevator modulus and escalators for connection with the station platform for passenger getting on/off, at that the individual bulk modulus weight does not exceed 40 tons.

[0004] "TURNKEY CITY CONSTRUCTION METHOD AND MULTIFUNCTIONAL URBAN COMPLEX" is the closest solution know from application for the invention of the Russian Federation No. 2014110646 (priority of 20/03/2014). Turnkey city construction method includes the construction of multistory residential and non-residential buildings, supplying them with above-ground and underground utilities, the formation of roads and sidewalks, multi-level inner-yard territories with parking. During the construction of multistory residential buildings, large courtyard car-free territories are formed, designed to accommodate the infrastructure within children's walking distance, including kindergartens, schools, leisure and cultural institutions, and non-residential buildings are located centrally to form the rest of the urban infrastructure, including administrative and commercial buildings. At that, the buildings are built using fast frame-monolithic technology, from prefabricated multi-layer large-format wall panels with external and internal finishing. And before developing the building area, the ground is cleaned and leveled, and then laser planning of the terrain is performed using laser illumination of the lines of location of structures and further marking of the soil for the structures; then the soil is removed along the marked lines and the foundation works are being carried out simultaneously with the formation of parking lots in the lower building levels, as well as with the construction of engineering communications, while transporting urban highways are connected with the parking lots located in the lower building levels. At the same time, the urban complex is supplied with interchange modules of intercity high-speed transport lines connected with roads using devices for automated passenger delivery.

[0005] Known solution contains a division into levels (underground and surface parking, car-free areas), which is in common with the proposed solution, and sectors (children's and administrative-and-household infrastructure), but the multi-level system is not sufficiently developed and structured in known solution; among other things, different types of transport are not separated by different levels, which does not rule out the appearance of traffic congestion caused by the accumulation of transport in the junctions of transport routes, and makes the horizontal zoning of the territory necessary.

Disclosure of Invention

[0006] The present invention allows to build a city with million people population, having an optimal transportation and logistics structure, in which there are no traffic congestions and accidents involving pedestrians, since the transportation and logistics system is multilevel and its transport levels do not intersect with each other, eliminating the emergence of hubs, in which traffic congestions are formed, and are interconnected by vertical ties, for example, elevators, staircases, escalators, etc., which interconnect not only transport levels, but also floors of residential and non-residential premises.

[0007] The technical result of the proposed solution is to optimize the transportation and logistics system of the city, eliminate traffic congestions and ensure rapid movement to any point in the city.

[0008] The technical result is achieved by urban transportation and logistics system that includes the first ground level for freight road and rail transport, the second level of pipeline and technical communications, the third level of passenger transport, the fourth pedestrian level, each level being located one above the other by means of reinforced concrete structures, and they are connected with each other and with residential and non-residential buildings by vertical staircase-elevator modulus.

Best Mode for Carrying Out the Invention

[0009] Urban transportation and logistics system is im-

plemented as follows.

[0010] Ground-level multistory frame is constructed by known methods, for example, of reinforced concrete using removable formwork, the height of each level is from 7 to 10 meters. At the first ground level, railway tracks for freight railway transport and motor roads for freight road transport are built, then, on reinforced concrete racks above the first level, a second engineering and technical level is located, at which pipelines are installed, such as water mains, heat and sewer pipes, garbage chute constructions, gas, electric networks, etc. The third level is equipped for passenger transport, namely, metro trains, travelators, electric buses, etc. The fourth level is designed and built for pedestrians (no means of transport other than man-powered one is permitted). It is the last one, and there are no other levels above it, so it is located under the open sky, and in some areas it can be equipped with a roof that protects against environmental influences, such as rainfall. The fourth level is a natural landscape and contains soil on its base, equipped with a hydroponics system (parts of which may be located on the second engineering and technical level) to maintain the life of plants and trees that form parks. Besides the natural park landscape, the level contains the necessary infrastructure: walking and cycling paths, children's and sports grounds, as well as other recreation areas for city residents. Also, on the fourth level, residential and non-residential high-rise buildings are located, elevator and staircase systems of which connect the floors of buildings with all levels of the transport system, and thus moving a person from building to building is ensured without having to go out through the third transport level.

[0011] The urban transportation and logistics system operates as follows.

[0012] A person lives, for example, in a hundred-story apartment building (an apartment building with a large number of floors is cost-effective for this system) in a city with a fully developed transport and logistics system. The garbage thrown out by a garbage chute immediately goes to the second engineering and technical floor, and then lower on the first floor to wagons of a freight train that takes the garbage to a recycling site, thus, there are no garbage cans in the same plane (same level) with human life (a person does not see garbage cans near the house and children's playgrounds, etc.), there are no garbage collection issues or traffic congestions caused by operation of garbage trucks. Water supply systems, electricity, heat flow to the apartment of a person from the second technical floor, during the breakthrough/repair of which the living space (fourth and third levels) of the person will not be affected in any way. The person can also walk in the park located on the fourth level, and go to work, even if the breakthrough of the sewage system or water line occurred at the same latitude and longitude with him/her, since these levels do not overlap and are above each other, and the repair and maintenance services of all systems of the second technical floor will not block or interfere with the operation of transport systems of other levels. A person goes down to the third level of passenger transport on a vertically moving elevator straight from his/her apartment building, without going outside, and quickly, without traffic congestions, moves to the desired point of the city. As transport systems are separated, there are no congestions, there are no pedestrian crossings at this level or freight traffic flow sections, pipeline transportation system. Arriving at the desired point in the city, the person takes the elevator to the fourth ground level, for example, to the park, where he/she works as a fitness instructor. Thus, being in the city with the proposed transport and logistics system, the person will quickly move to the point he/she needs, with no traffic congestions, garbage cans, the atmosphere polluted with exhaust gases, with no possibility to be hit by any vehicle, because each of the systems is optimally located at its level, without blocking or interfering with the operation of another system located at a parallel non-intersecting level. This will be a solution to the transport problem, a catalyst for internal development aimed at the rational use of the city's areas.

[0013] The present invention with the whole set of essential features greatly optimizes the transportation and logistics system of the city, eliminating traffic congestions and ensuring quick movement to any point therein.

Industrial Applicability

[0014] The invention may be used in construction of million people population cities from scratch, meets the requirement of industrial applicability, since the technologies of its construction are known and are common today.

[0015] The invention with the whole set of the essential features for a specialist is not obvious from the prior art, therefore, it involves an inventive step.

[0016] This technical solution is not limited to the embodiments shown here and can be freely modified within the framework of the technical solution formula.

Claims

1. The urban transportation and logistics system, including the first ground level for road and rail freight transport, the second level of pipeline and technical communications, the third level of passenger transport, the fourth pedestrian level, each level being located one above the other, and they are connected with each other and with residential and non-residential buildings by vertical staircase-elevator modulus.

INTERNATIONAL SEARCH REPORT

International application No.

A. CLASSIFICATION OF SUBJECT MATTER

E01C 1/04 *(2006.01)*
E04B 1/00 *(2006.01)*

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)

E01C 1/00, 1/02, 1/04, E04B 1/00, E01D 1/00, 2/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatSearch, esp@cenet, USPTO, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	RU 36018 U1 (KORNATSKY ARKADY ALEKSEEVICH) 20.02.2004	1
A	RU 2314947 C2 (SHLYKOV ALEKSANDR MIKHAILOVICH) 20.01.2008	1
A	US 1784728 A (J.A. HARRIS S) 09.12.1930	1

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

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"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

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"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
26 July 2017 (26.07.2017)	07 September 2017 (07.09.2017)
Name and mailing address of the ISA/ RU Facsimile No.	Authorized officer Telephone No.

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- RU 2014110646 **[0004]**