



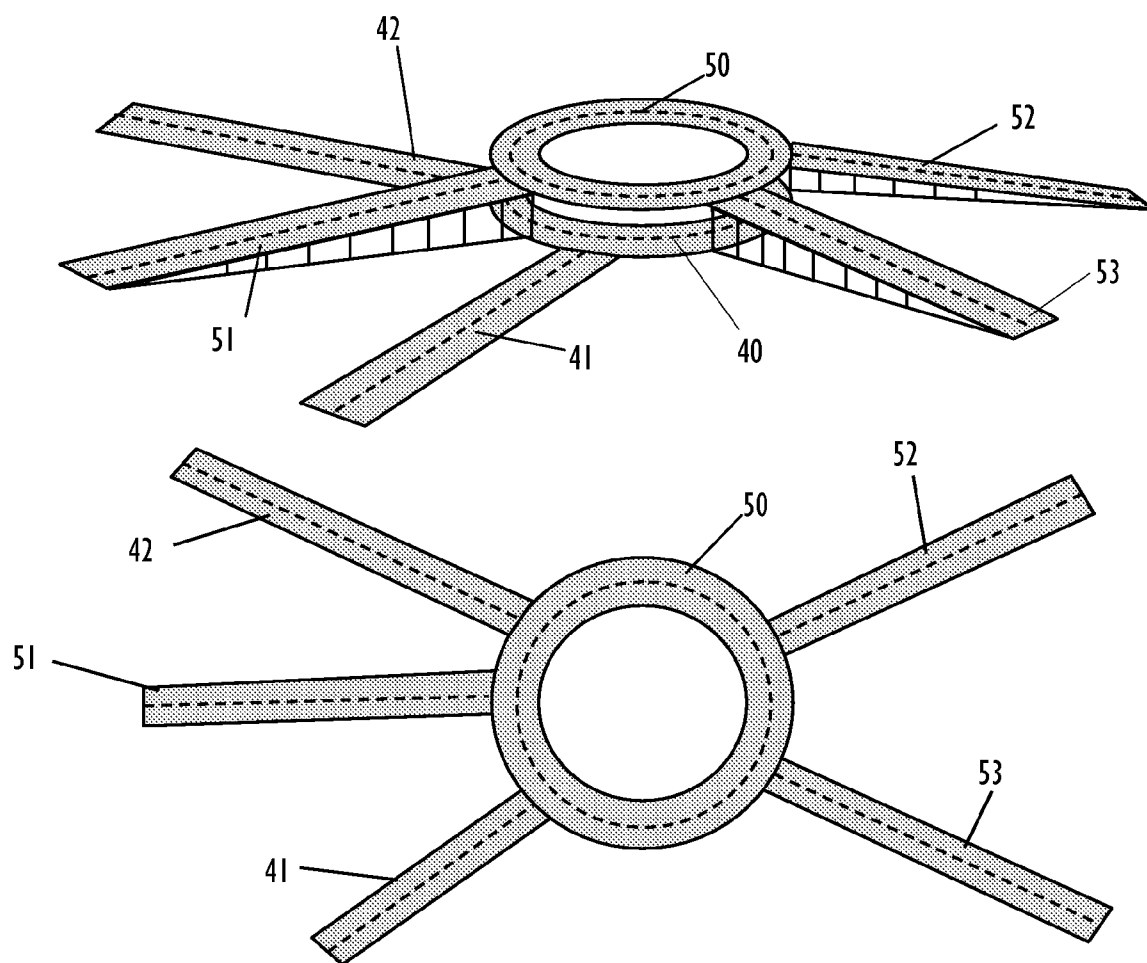
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(19) **United States**(12) **Patent Application Publication**
Berman et al.(10) **Pub. No.: US 2009/0035058 A1**(43) **Pub. Date: Feb. 5, 2009**(54) **INTERCHANGE SYSTEM**(52) **U.S. Cl. 404/1**(76) Inventors: **Reuben Berman**, Beer-Sheva (IL);
Anna Berman, Beer-Sheva (IL)(57) **ABSTRACT**

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Reuben Berman**P.O. Box 3773****Beer Sheva (IL)**(21) Appl. No.: **11/833,260**(22) Filed: **Aug. 3, 2007****Publication Classification**(51) **Int. Cl.**
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An interchange system for transition between crossing roadways, the interchange system comprising: two or more traffic circles, each of the traffic circles being disposed in a different level, at least one of the crossing roadways being connected to at least two of the traffic circles and allowing vehicles from the one roadway to enter to each of the two traffic circles. The inner space of the traffic circles may be used as a building, a gas station, parking yards, for landscape, and so forth. The interchange may further comprise one or more transition roadways for interconnecting between some or all of the traffic circles. A transition roadway may be inner to the traffic circles it connects or outer to the traffic circles it connects.



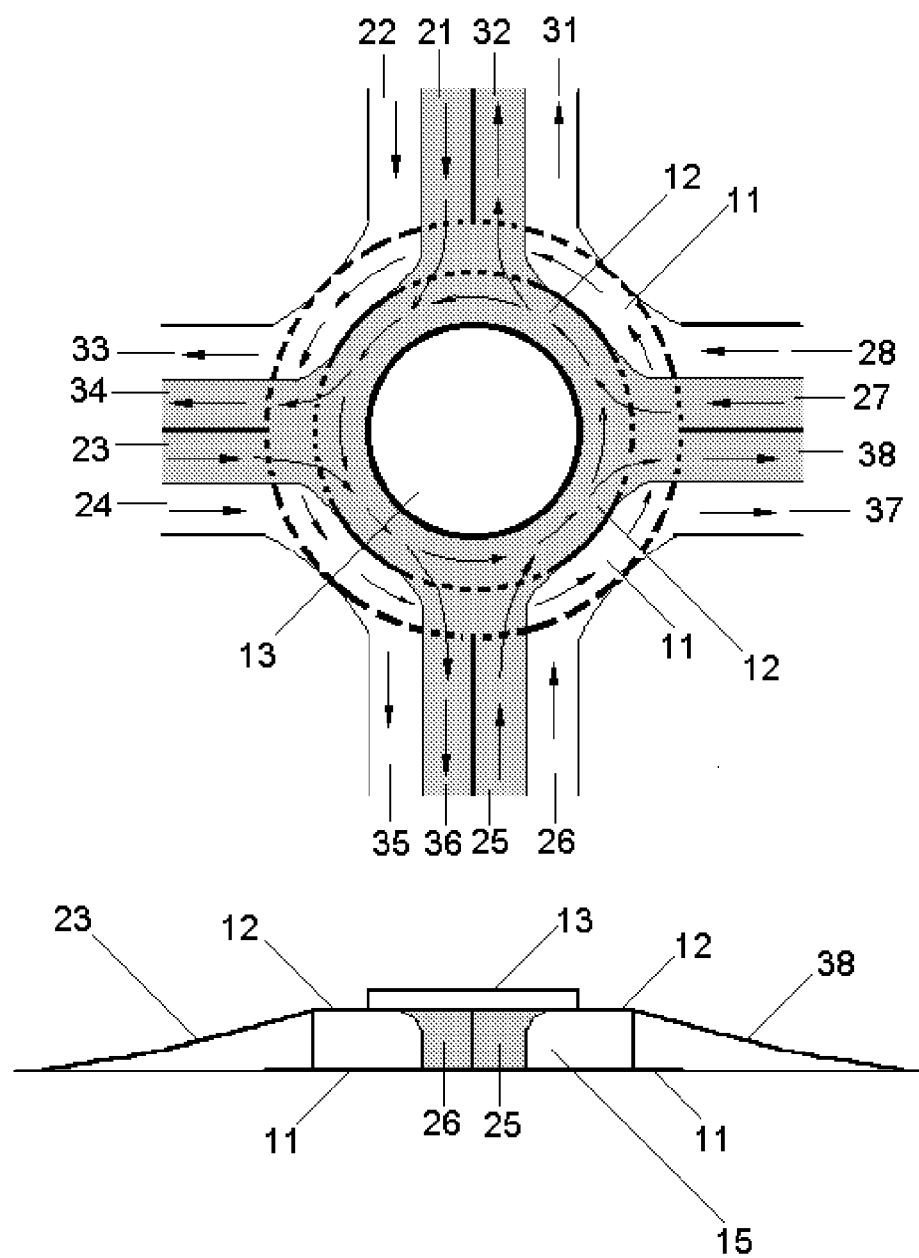


Fig. 1

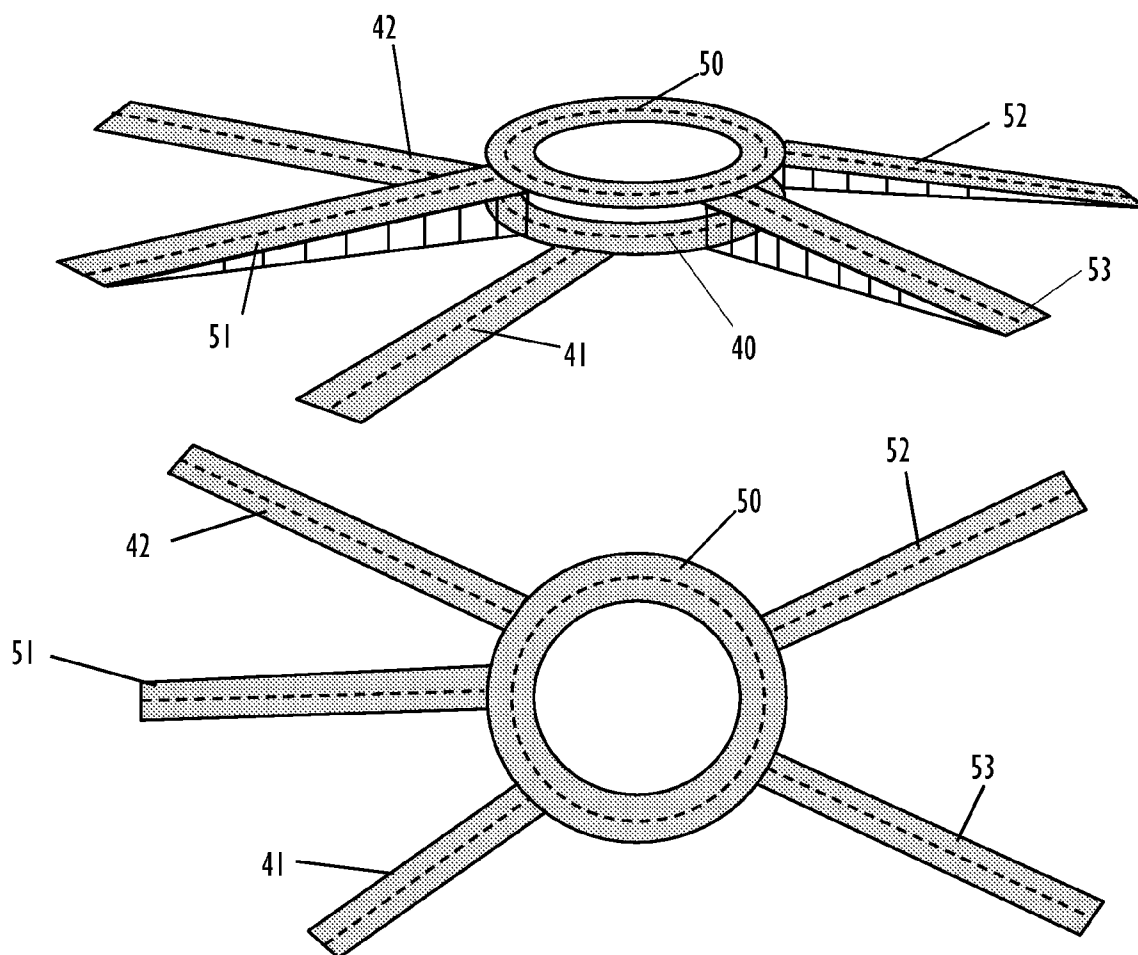


Fig. 2

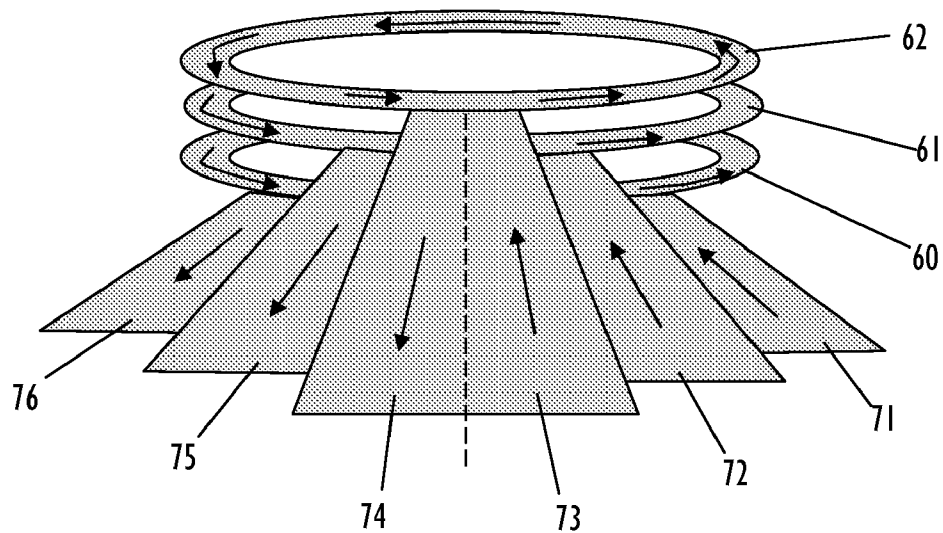


Fig. 3

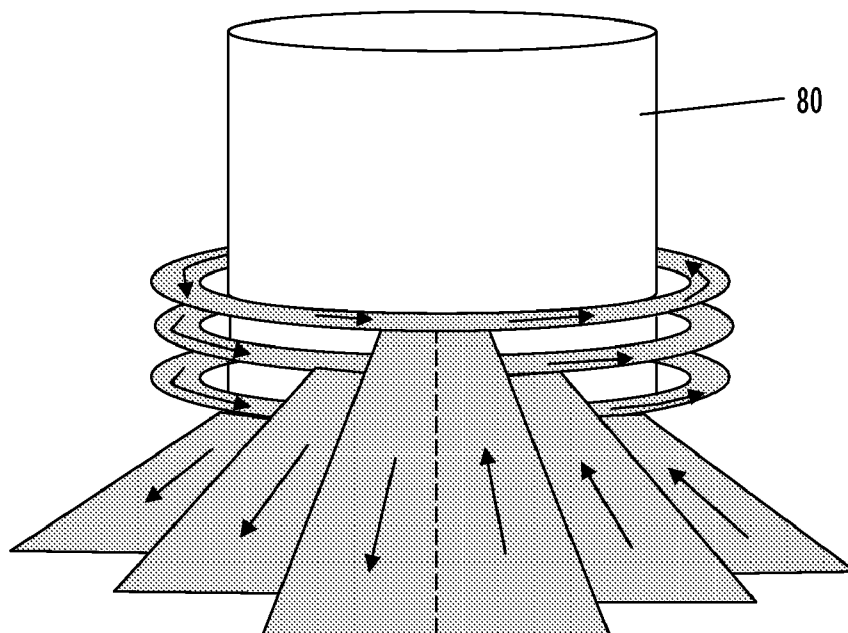


Fig. 4

INTERCHANGE SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to the field of traffic. More particularly, the invention relates to an interchange constructed of traffic circles.

BACKGROUND OF THE INVENTION

[0002] In order to facilitate the reading of the description to follow, a number of terms employed in the art are defined below:

[0003] Intersection—a place where two or more roadways intersect.

[0004] Interchange—a road junction designed so that streams of traffic do not intersect.

[0005] Traffic circle or rotary—a road junction at which traffic moves in one direction around a central traffic island.

[0006] Nowadays the use of traffic circles is very common, and therefore in many countries it is anchored in the traffic laws. One of the most well known traffic circles is that which surrounds the Arc de Triumph in Paris.

BENEFITS AND DRAWBACKS OF THE PRIOR ART

[0007] The traffic rules in a traffic circle are simple and clear. Usually they comprise at least the following articles: The traffic direction is carried out in one-way, and the vehicles that are already inside the traffic circle have priority on vehicles that intend to enter into the rotary. Of course there are variations to the traffic rules regarding the traffic circle, however the above mentioned rules sustain in many countries.

[0008] From the traffic point of view, the traffic circle has several advantages when compared to crossed intersections:

[0009] Less inhibitory: While the entrance in an intersection is carried out from one or maximum two lanes, in traffic circle the entrance can be carried out from all the lanes. The same is true for the exit—while the exit from an intersection is carried out from one or maximum two lanes, in a traffic circle the exit can be carried out from all lanes. Hence, the traffic in a traffic circle is less inhibitory than a crossed intersection.

[0010] Smaller viewing field: While in a crossed intersection a wide viewing field is essential (so that a vehicle approaching the intersection can see the crossing traffic in order to prevent an accident), the required viewing field in a traffic circle is much smaller.

[0011] No need for traffic lights: Since the traffic rules in a traffic circle are simple and clear, there is usually no need for traffic lights for regulating the traffic. The result is fewer expenses when using a traffic circle instead of an intersection coupled with traffic lights.

[0012] Safety: From the safety point of view, the number of accidents has been decreased tremendously in the majority of the junctions wherein the intersection has been replaced with a traffic circle.

[0013] Esthetical: Since the traffic lane of a rotary is annular, the center of a rotary may be used for esthetical purposes, such as a small flowerbed or a statue. Moreover, the absence of traffic lights contributes to the landscape.

[0014] However, the rotary has a major drawback:

[0015] Blocking: When the traffic load in a traffic circle passes beyond a certain point, the vehicles that move inside

the rotary are blocking the vehicles that want to enter the rotary, and the result is a traffic jam. Therefore, the use of traffic circle in loaded roads and highways is not common.

An Intersection vs. an Interchange

[0016] Intersections usually are an obstacle to traffic. Incoming vehicles may have to slow down or even stop before passing through an intersection.

[0017] With an intersection, the driver has to actually cross through an opposing stream of traffic, thereby resulting in a need for the opposing stream of traffic to slow down and stop.

[0018] One way to eliminate these problems is the use of an interchange. By using an interchange instead of a crossed intersection, two benefits are gained: the road crossing is eliminated, since crossing an opposing stream of traffic is carried out by moving above or under the lane, and the passing vehicles do not have to stop. Hence, the traffic in an interchange is continuous, contrary to a crossed intersection where the traffic is intermittent.

[0019] However, the interchange is less comprehensive to the human mind than a crossed intersection, since sometimes turning left requires using the right lane, and vice versa. Hence, a driver passing through an interchange must depend on the road signs more than on his own senses. Moreover, usually a driver has to decide which lane to choose hundred meters before reaching the interchange, when he can't see the direction of the lane he wants to select. In a traffic circle the driver selects the lane after reaching the rotary, and if he can't make up his mind, he can move in the rotary while considering the options. From the rotary he can see where the lane he wants to select leads.

THE OBJECTS OF THE INVENTION

[0020] Due to the fact that in a traffic circle, when the traffic load passes beyond a certain point, vehicles that move inside the rotary are blocking the vehicles that want to enter the rotary, the use of traffic circles in loaded roads and highways was never common.

[0021] It is therefore an object of the present invention to provide an interchange system which is based on traffic circles.

[0022] It is another object of the invention to provide an interchange system based on traffic circles that is suitable for use in loaded roadways and highways.

[0023] It is a further object of the invention to provide an interchange system based on traffic circles, wherein the required time for passing through the interchange system is less than the required time for passing a traffic circle.

[0024] It is a still further object of the invention to provide an interchange system, wherein the area inside the rotary can be used for a building, gas station, park yard, landscape, and so forth.

[0025] Other objects and advantages of the invention will become apparent as the description proceeds.

SUMMARY OF THE INVENTION

[0026] An interchange system for transition between crossing roadways, the interchange system comprising: two or more traffic circles, each of which of the traffic circles being disposed in a different level, at least one of the crossing roadways being connected to at least two of the traffic circles and allowing vehicles from the one roadway to enter to each of the two traffic circles. The interchange system may further

comprise transition roadways, for interconnecting between two or more of said traffic circles. The transition roadways may be inner or outer to the traffic circles. The inner space of the traffic circles may be used as a building, a gas station, parking yards, for landscape, and so forth. The interchange may further comprise one or more transition roadways for interconnecting between some or all of the traffic circles. A transition roadway may be inner to the traffic circles it connects or outer to the traffic circles it connects.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] The above and other characteristics and advantages of the invention will be better understood through the following illustrative and non-limitative detailed description of preferred embodiments thereof, with reference to the appended drawings, wherein:

[0028] FIG. 1 schematically illustrates a top view and a side view of an interchange system constructed of two traffic circles, each one in a different level, according to a preferred embodiment of the invention;

[0029] FIG. 2 schematically illustrates a perspective view of an interchange system constructed of two traffic circles, each one in a different level, according to a preferred embodiment of the invention;

[0030] FIG. 3 schematically illustrates a perspective view of an interchange system constructed of three traffic circles, each one in a different level, according to a preferred embodiment of the invention; and

[0031] FIG. 4 schematically illustrates a perspective view of an interchange system wherein the inner side comprises a building, according to a preferred embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0032] The major problem of a traffic circle is that beyond a certain point of traffic load, vehicles entering the rotary are blocked by the vehicles that already moving inside the rotary. Hence, adding lanes to a traffic circle doesn't necessarily solve the problem.

[0033] The present invention deals with the above-mentioned problem by the means of an interchange system that consists of multiple traffic circles constructed in different levels. This way, the capacity of the vehicles that can pass through this interchange significantly increases, and hence the traffic load significantly decreases.

[0034] The inner space of the construction can be used for a building, such as a mall, cinema, gas station, parking yard, landscaping, etc. This feature is very significant since in some areas the value of the soil can be very expensive.

[0035] FIG. 1 schematically illustrates a top view and a side view of an interchange system constructed of two traffic circles, each one in a different level, according to a preferred embodiment of the invention.

[0036] The lower rotary 11 surrounds the upper rotary 12. In the middle of rotary 11 there is a construction 15, such as a mall. The construction 15 is used also as a base for the upper lane 12. In the middle of the upper rotary 12, i.e. above the mall, there is a garden 13.

[0037] The entrance to the interchange is carried out from lanes 21, 22, 23, 24, 25, 26, 27 and 28. The exit from the interchange is carried out from lanes 31, 32, 33, 34, 35, 36, 37 and 38.

[0038] FIG. 2 schematically illustrates a perspective view of an interchange system constructed of two traffic circles, each one in a different level, according to a preferred embodiment of the invention. The entrance to and the exit from the lower rotary 40 is carried out from lanes 41 and 42. The entrance to and the exit from the upper rotary 50 is carried out from lanes 51, 52 and 53. The radius of the lower rotary 40 and the upper rotary 50 are about the same.

[0039] FIG. 3 schematically illustrates a perspective view of an interchange system constructed of three traffic circles, each one in a different level, according to a preferred embodiment of the invention. The levels are the underground rotary 60, the ground level rotary 61, and the aboveground rotary 62. The illustration demonstrates also that the middle lanes 73 and 74 connect to the upper rotary 62, while the outer lanes 71 and 76 connect to the lower rotary. The arrows demonstrate the traffic direction. The entrance/exit to rotary 60 is carried out from lanes 71 and 76 respectively. The entrance/exit to rotary 61 is carried out from lanes 72 and 75 respectively. The entrance/exit to rotary 62 is carried out from lanes 73 and 74 respectively.

[0040] It should be noted that for the sake of brevity, not all the connected crossing roads have been demonstrated in FIG. 3.

[0041] The geometric shape of a traffic circle does not necessarily have to be a circle, but any annular shape. Also, the planes of the traffic circles do not necessarily have to be parallel to each other or parallel to the ground.

[0042] In FIG. 1, the radius of the ground level rotary is bigger than the radius of the upper level rotary. Hence, the space 15 inside the rotaries 11 and 12 may be used for a practical purpose, such as a gas station, mall, etc.

[0043] According to an embodiment of the invention, the inner side of the interchange system may be used for a spiral lane where vehicles can move from one level to another. This way some levels of the construction can be used as parking yards. After leaving the parking yard, a vehicle can reach a traffic circle by moving along the spiral lane. This feature is very essential, since any commercial place requires parking space.

[0044] According to another embodiment of the invention, the spiral is outer to the traffic circle(s).

[0045] FIG. 4 schematically illustrates a perspective view of an interchange system wherein the inner side comprises a building, according to a preferred embodiment of the invention. The building 80 is placed in the inner side of the construction.

[0046] It should be noted that for the sake of brevity, not all the connected crossing roads have been demonstrated in FIG. 4.

[0047] The above examples and description have of course been provided only for the purpose of illustration, and are not intended to limit the invention in any way. As will be appreciated by the skilled person, the invention can be carried out in a great variety of ways, employing more than one technique from those described above, all without exceeding the scope of the invention.

1. An interchange system for transition between crossing roadways, said interchange system comprising: two or more traffic circles, each of said traffic circles being disposed in a different level, at least one of said crossing roadways being connected to at least two of said traffic circles and allowing vehicles from said one roadway to enter to each of said two or more traffic circles.

2. An interchange system according to claim 1, wherein each of said traffic circles is disposed at a position selected from a group consisting of: the ground level, under the ground level, above the ground level.

3. An interchange system according to claim 1, wherein two or more of said traffic circles are about the same dimensions.

4. An interchange system according to claim 1, wherein one of said traffic circles surrounds at least one of the rest of said traffic circles.

5. An interchange system according to claim 1, wherein the inner of two adjacent traffic circles of said traffic circles is disposed in a higher level than the other.

6. An interchange system according to claim 1, wherein at least one of said traffic circles is disposed in a lower level than an adjacent traffic circle to said traffic circle.

7. An interchange system according to claim 1, wherein at least one of said traffic circles is disposed in a higher level than an adjacent traffic circle to said traffic circle.

8. (canceled)

9. (canceled)

10. (canceled)

11. An interchange system according to claim 1, wherein the inner space of said traffic circles is used for a building.

12. An interchange system according to claim 11, wherein said building is used for a purpose selected from a group comprising: a public purpose, a private purpose, a practical purpose, a mall, a cinema, a gas station, and a parking yard.

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