A fun park attraction (1) is described, which comprises a base (2) to support a support upright (4), a rotating element (6) having a first end (61) rotatably connected to said support upright (4) and therein rotatably driven by driving means (5), and a second end (62) rotatably supporting, by connection means (8, 30), at least one nacelle (12) for housing groups of seats (14) for passengers (15).
Description

[0001] The present invention relates to an attraction particularly for fun parks, amusement parks and the like.

[0002] Different types of attractions for fun parks have already been proposed, and in particular of the nacelle type, i.e. comprising an element on which at least one group of seats for passengers is mounted, which is made to rotate about one or more axes.

[0003] For example, in the attraction described in European Patent EP0613706B1, the nacelle may rotate about a horizontal axis as it is mounted suspended and rotatable at an end terminating in a fork, of a support arm at the other end of which is a counterweight. The support arm, in intermediate position with respect to the two ends thereof, is hinged, rotatable on a horizontal axis, parallel to the one of rotation of the nacelle, with respect to the forked end, and supported by support columns. The fun for the passengers is generated by the rotations about a horizontal axis of the nacelle mounted on the support arm, which in turn will rotate, like a pendulum, about another horizontal axis, parallel to the one of rotation of the nacelle.

[0004] Another "nacelle" type attraction of known type is described in American Patent US5188566A. In this attraction, instead of a forked end of a support arm, a pair of parallel arms is used, at one end of which a nacelle rotatable about a horizontal axis is hinged, with rows of seats for passengers, parallel to the latter axis, and at the other end of which a counterweight is provided. The pair of parallel arms, in intermediate position with respect to the two ends, is also hinged rotatable about a horizontal axis, parallel to the one of rotation of the nacelle, which due to some support columns at variable height, may raise the two parallel arms to the wanted height. What is certain is that when the arms begin rotating about the horizontal axis like a pendulum, passengers will perform both a circular trajectory or arc, and they will rotate integrally both clockwise and counter clockwise with the nacelle about the horizontal axis of rotation thereof. In this second example, the axis of rotation of the nacelle and the one of rotation of the two support arms are also substantially parallel.

[0005] In International Patent WO03041826A1, reference is made to a fun park attraction comprising a support column, bottomly and rotatably constrained to a base which is integral with the ground and free at the top. A nacelle is constrained with sliding engagement to said support column and is intended to be capable of sliding thereon from the upper end to the lower end and vice versa. The attraction is characterized in that the lower end of the support column may rotate about a horizontal axis being reciprocally hinged with the base: the support column can thus move like an upside-down pendulum. In this type of known attraction, the nacelle will move along the column, but it is not provided for it to rotate with respect thereto.

[0006] In Patent DE202004001477U1, a type of known attraction is described consisting of a "tower-like" middle support element, which is slidingly hinged with a nacelle which can longitudinally lie thereon. An end of the middle element, equipped with counterweight, is constrained to a base by means of a universal joint, and can move radially therein with the restriction set by specific stops. The "tower-like" middle element can thus be inclined with respect to the vertical, and the upper end thereof can thus describe closed curvilinear trajectories. It is provided that the nacelle move along the middle element, but it is not provided for it to rotate with respect thereto.


[0008] It would be desirable to have a fun park attraction which involves the passengers in rotations with an increased level of freedom, thus increasing the fun.

[0009] The main object of the present invention is to provide a fun park attraction, which ensures satisfaction and fun for its passengers in complete safety.

[0010] Another object of the present invention is to provide a fun park attraction which is capable of transmitting accelerations along different directions to its passengers.

[0011] A further object of the present invention is to provide a fun park attraction both of the fixed installation type and of the movable type and transportable for travelling use.

[0012] In accordance with the invention, such an object is achieved with a fun park attraction as described in claim 1.

[0013] These and other features of the present invention will become more apparent from the following detailed description of some of the practical embodiments thereof, shown by way of non-limiting example in the accompanying drawings, in which:

- figure 1 shows a perspective side view of a first embodiment of a fun park attraction according to the present invention;
- figure 2 shows another perspective side view of the fun park attraction in figure 1, where two of the possible positions are noted, which can be taken on by a support nacelle for passengers, due to a half-turn rotation about one of the possible axes of rotation;
- figure 3 shows a side view of the fun park attraction in figure 1, in which, similarly to figure 2, two of the possible positions are noted, which can be taken on by a support nacelle for passengers, due to a half-turn rotation about one of the possible axes of rotation;
- figure 4 shows a perspective side view of a second embodiment of a fun park attraction according to the present invention, in lowered position;
- figure 5 shows another perspective side view of the embodiment in fig. 4, in raised position;
- figure 6 shows a perspective side view of the embodiment in fig. 4, in lowered position in which a different type of support nacelle for passengers is used;
- figures 7 and 8 show a perspective side view of types
of support nacelles for passengers according to the present invention; figure 9 shows a third embodiment of a fun park attraction according to the present invention, in lowered position, in which a pair of nacelles is used; figure 10 shows the embodiment in figure 9, in raised position; figure 11 shows a forth embodiment of a fun park attraction according to the present invention, in lowered position, in which a pair of nacelles is used; figure 12 shows the embodiment in figure 11, in raised position; figure 13 shows a fifth embodiment of a fun park attraction according to the present invention, in lowered position; figure 14 shows a perspective view of an enlarged detail of a lifting and lowering system for a support arm of a fun park attraction, according to the present invention; and figure 15 shows a side view of the attraction in fig. 10; figure 16 shows a perspective view of a sixth embodiment of a fun park attraction according to the present invention.

With reference to the above-listed figures from 1 to 3, it will be noted how, in a first embodiment, a fun park attraction 1 comprises a base resting on the ground 2, from which a support upright 4 overhangingly extends, substantially vertical, i.e. orthogonal to said base 2, having, if desired, a rectangular section with a lower end 42, from which a support upright 4 overhangingly extends, hinged at an end 42 thereof to said base 2. The support upright 4 will support, at the free, upper end 41 thereof, driving means 5 connected with a rotating arm 6. The axis of rotation of the driving means 5 will not be perfectly horizontal but inclined, slightly, by an angle $\beta$ e.g. of 15° (see fig. 3). As will be particularly noted in figures 2 and 3, the axis of rotation $V-V'$ of the driving means 5 and the axis of symmetry $S-S'$ of the rotating arm 6 are perfectly parallel and on the contrary, there is an angle $\alpha$ between axis $S-S'$ and axis $V-V'$, between 20° and 30°, if desired. The rotating arm 6 has one end 61 rotatably constrained to the support upright 4 by means of the driving means 5, and a second end 62 connected perpendicularly close to the median point of a forked element 8, substantially describing a semi-circular broken line ending with a pair of ends 81 and 82. Said ends 81 and 82 lie on an axis O-O' substantially orthogonal to axis $S-S'$ of the rotating arm 6. The two ends 81 and 82 rotatably support the two ends of a cross member 10, with substantially U-shaped profile, at the median point of which, and more precisely in the concave part thereof, support means 12 for passengers 15 are rotatably constrained. In particular, said support means 12 for a certain number of passengers 15, e.g. one dozen, are called “nacelle” 12 in jargon. In the example at hand, nacelle 12 consists of a disc-shaped element 13, which along the perimeter thereof, supports a group of seats 14 of known type, equipped with known safety means 141, for passengers 15. Nacelle 12 can rotate with respect to the cross member 10 along the axis of rotation T-T' substantially orthogonal to the axis of rotation O-O' of the cross member 10 with respect to the forked element 8. The rotation of nacelle 12 about axis T-T' can be idle or motorized by comprising driving means 17 and, preferably, a braking system 18 is provided for controlling the rotation speed of nacelle 12 about axis T-T'. Base 2 can provide a small ladder 20, preferably of retractable type.

With reference to the above-listed figures from 4 to 6, it will be noted how, in a second embodiment, a fun park attraction 1 comprises a base resting on the ground 2, from which a support upright 4 overhangingly extends, hinged at an end 42 thereof to said base 2. The other end 41 of the support upright 4 is constrained to said base 2 by means of the lifting elements 22, consisting of hydraulic cylinders of known type, if desired. Hinged at the end 41 of the support upright 4, preferably having substantially rectangular section, is an articulated joint element 23, substantially consisting of a pair of parallel triangular plates 24. A vertex 241 of plate 24 is exactly hinged with end 41 of the support upright 4, another vertex 242 of plate 24 is connected to an end 251 of a contrasting tie rod 25 in turn hinged, with its end 252, to said base 2. Connected to the third vertex of the two triangular plates 24 are driving means 5 on which a rotating arm 6 is mounted which, with respect to the first embodiment of the fun park attraction 1, will be much shorter. Similarly to the first embodiment shown in figures from 1 to 3, the rotating arm 6 in the second embodiment shown in figures 4 and 5 is also connected to a forked element 8 supporting similar nacelle 12. The substantial difference between the first and the second embodiment is that, in the example shown in figures 1-3, the axis of rotation $V-V'$ of the driving means 5 has a predefined angle $P$ with respect to a horizontal plane, while in the second example shown in figures 4 and 5, the axis of rotation $V-V'$ of the driving means 5 will vary as the position varies of the two rectangular plates 24, i.e. based on the length taken on by the two lifting elements 22.

With reference to fig. 6, it will be noted that the fun park attraction 1 will differ from the one in figures 4 and 5 due to the fact that a different type of nacelle 12 was used other than the one disclosed above, coupled at the ends 81 and 82 of the forked element 8 by means of a straight cross member 10, in the median point in which, integral with said cross member 10, but rotatable about an axis T-T', orthogonal to the axis of rotation O-O' of said cross member 10 with respect to said forked element 8, a group of arms 26 is connected, radially arranged, angularly equally spaced, if desired, at the free ends of which groups of seats 14 of known type are connected for passengers 15.

Figures 7 and 8 show two possible versions of nacelle 12 disclosed above and shown in figure 6. In particular, nacelle 12 in fig. 7 consists of a cross member 10, suitable for being coupled with said forked element.
8, having a slight curvature in median position, in which concavity, as occurs in nacelle 12 in fig. 6, a group of arms 26 is connected, radially arranged, angularly equally spaced but are close to each other in pairs, and groups of seats 14 of known type, for passengers 15 are connected to their adjacent free ends.

[0018] The nacelle in figure 8 differs from the one in figure 7 because the arms 26 are not angularly equally spaced but are close to each other in pairs, and groups of seats 14 of known type, for passengers 15 are connected to their adjacent free ends.

[0019] With reference to figures 9 and 10, a third embodiment will be noted of a fun park attraction 1 according to the present invention, in which, with respect to the second embodiment shown in figures 4, 5 and 6, the rotating arm 6 consists of a substantially cylindrical straight element with one end 61 connected with the driving means 5 and the other end 62 rigidly connected with an element of transmission 30, at all ends 31 of which a support bar 33 is rotatably coupled in the median point thereof: said bar 33 is equipped, at one end 331, with counterweight and at the other end 332 is connected to a group of seats 14 of known type, for passengers 15. Obviously, the groups of seats 14 are connected to bar 33, facing each other from the opposite pars with respect to the rotating arm 6, and furthermore, the element of transmission 30 comprises the kinematic chains required to independently put each support bar 33 into rotation. In this embodiment, the axis of symmetry V-V' of the rotating arm 6 and the axis of rotation O-O', of symmetry for the element of transmission 30, are also substantially orthogonal.

[0020] With reference to figures 11 and 12, a fourth embodiment of the fun park attraction 1 consists in fact of a variant of the third example shown in figures 9 and 10, differentiating itself from the latter in that rotatably connected to each end of the element of transmission 30, on-axis with the element of transmission 30, i.e. according to the axis of symmetry O-O', is a support axle 34 for groups of seats 14, which backs will be connected to said axle 34.

[0021] With reference to figure 13, it will be noted how a fifth embodiment of a fun park attraction 1 is substantially a variant of the embodiment shown in figures 4 to 6 where a nacelle 12 was used consisting of two rows of groups of seats 14, parallel and backs opposed, mounted parallel on a support cross member 10, parallel to the axis of rotation O-O', which two ends are rotatably connected in the ends 81 and 82 of the forked element 8.

[0022] The base resting on the ground 2 can be conveniently replaced by a towable semitrailer, if an installation that is movable as required - or better yet is travelling - is opted for.

[0023] In practice and with reference to the first embodiment of the fun park attraction 1, i.e. the attraction described in figures 1 to 3, the passengers 15 will access nacelle 12 by climbing ladder 20, which will initially be positioned at the height of nacelle 12 to then be retracted so as not to interfere with moving elements of attraction 1. Once on board nacelle 12, each passenger will sit down in his/her own seat 14, remaining anchored there due to provided safety means 141. Once all the passengers 15 are in their seats 14, computerized control systems will activate the driving means 5, which depending on the program wanted, will cause the rotating arm 6 to perform complete turns, both clockwise and counter clockwise, about the axis of rotation V-V', or partial rotations. In fact, as the axis of rotation V-V' of the rotating arm 6 is generally, but not necessarily, inclined by an angle α with respect to the axis of symmetry S-S' of the rotating arm 6, end 62 of the rotating arm 6 will describe a circular trajectory each time said rotating arm 6 performs one turn. With respect to when they climbed onto nacelle 12, the passengers 15, due to a half turn by the rotating arm 6, will be upside down and the balance of nacelle 12 will be unstable and hence it will tend to return to stable balance by performing some rotations about axis O-O' while passing through the two ends 81 and 82 of the forked element 8. Moreover, nacelle 12 can simultaneously be placed into rotation along axis T-T' by means of the driving means 17, which are equipped with braking means 18 for controlling the accelerations to which the passengers 15 are subjected during the rotation of the rotating arm 6 about axis V-V', of nacelle 12 about axis O-O' and of axis T-T'.

[0024] All the other embodiments of the fun park attraction 1 share the fact that the support upright 4 may bring itself from a lowered position, in which it is substantially parallel to base 2, to a raised position in which, due to a rotation of an end 42 thereof, hinged to base 2, the end 41 thereof is moved away from base 2, pushed by the lifting elements 22. In the raised position, attraction 1 stands out for the fact that the rotating arm 6 also moves away from base 2, and as axis V-V' will be inclined with respect to base 2, end 62 of the rotating arm will also be lifted. In the embodiments in figures 4, 5, 6 and 13, the raised position of attraction 1 will also lead to a raised height for nacelle 12.

[0025] In particular, nacelle 12 in the embodiments in figures 4, 5 and 6, equally to the embodiment in figures 1 to 3, can rotate about axis V-V' of the driving means 5, axis O-O' passing through the ends 81 and 82 of the forked element 8, orthogonal to axis V-V', to the axis of rotation T-T' of the driving means 17, orthogonal to axis O-O'. The rotation of nacelle 12 about axis O-O' causes axis T-T' to describe a plane on which axis V-V' of the driving means 5 will lie.

[0026] With reference to the embodiment in figure 13, with respect to the one shown in figures 4 to 6, a nacelle 12 was replaced with a disc-shaped base, or however rotating about axes T-T' and O-O', with a nacelle 12 only rotating about axis O-O' and hence with one less degree
A fun park attraction (1) according to claim 1 or 2, characterized in that said one pair of ends (81, 82) rotatably supports the two ends of a cross member (10), at the median point of which support means (12) for passengers (15) are rotatably constrained.

4. A fun park attraction (1) according to claim 3, characterized in that said support means (12) for passengers (15) consist of a disc-shaped element (13), along which perimeter it supports a group of seats (14) for passengers (15).

5. A fun park attraction (1) according to claim 4, characterized in that said support means (12) are rotatably mounted on said cross member (10) on an axis of rotation T-T' substantially orthogonal to the axis of rotation O-O' of the cross member (10) with respect to the forked element (8).

6. A fun park attraction (1) according to claim 5, characterized in that the rotation of said support means (12) for passengers (15), at the axis T-T', is motorized by driving means (17) and comprises a braking system (18) for controlling the rotation speed of the support means (12) about the axis T-T'.

7. A fun park attraction (1) according to any one of the preceding claims, characterized in that said support means (12) are adapted to independently rotate about a first axis (O-O'), a second axis (T-T') and a third axis (V-V').

8. A fun park attraction (1) according to any one of the preceding claims, characterized in that said first end (61) of said rotating arm (6) comprises an articulated joint element (23), connected to said base (2) by means of contrasting tie rods (25), and in that said support upright (4) comprises lifting means (22) adapted to change the inclination of said support upright (4) with respect to the ground.

9. A fun park attraction (1) according to claim 8, characterized in that the articulated joint element (23) consists of a pair of parallel triangular plates (24), a first vertex (241) of the plates (24) being hinged at one end (41) of the support upright (4), a second vertex (242) of the plates (24) being connected at one end (251) of a contrasting tie rod (25), which other end (252) is in turn hinged at said base (2), driving means (5), on which the rotating arm (6) is mounted, being connected to a third vertex of the two triangular plates (24).

of freedom. This fact results in the passengers 15 being subjected to the accelerations only caused by the rotations about the axes V-V' and O-O'.

Similarly to the above disclosure, in the example shown in figures 11 and 12 too, the passengers 15 will feel the accelerations generated by the rotation of the rotating arm 6 about axis V-V' and of the rotation of the support axes 34 for groups of seats 14 about axis O-O', the degree of freedom of the rotation about axis T-T' lacking in this embodiment. The rotation on axis O-O' causes the passengers 15 to perform somersault trajectories.

The same can be said for the embodiment shown in figures 9 and 10, which differentiates from the previous one in figures 11 and 12 due to the rotation on axis O-O' transmitting a rotation like a wheel to the passengers 15, the axis of rotation of the passengers 15 substantially being orthogonal to their trunk.

Figure 16 shows a sixth embodiment of a fun park attraction 1 according to the present invention, in which the support upright consists of a vertical column 4 which rigidly supports a fixed inclined arm 51 at one end 52 of which a motorized rotating element 53 is associated, which is driven by driving means 5, adapted to rotatably support, by means of connection means 8, a nacelle 12 for example similar to the one shown in figure 1.

With respect to the embodiment in said figure 1, the rotating element is substantially a plate 53, in place of arm 6, which first end 55 is rotatably associated with the fixed arm 51, and having a second end 54 supporting nacelle 12 by means of connection means 8.

 Advantageously, in any one of the above-described embodiments, the connection means of nacelle 12 may comprise jointed means, for example arms connected by means of articulated joints.

In practice, any materials and also dimensions may be used, depending on the needs.

Claims

1. A fun park attraction (1) comprising a base resting on the ground (2), from which a support upright (4) overhangingly extends which supports, at a upper end (41) thereof, driving means (5) connected to a rotating arm (6), characterized in that the axis of rotation V-V' of said driving means (5) is inclined by an angle α with respect to the axis of symmetry S-S' of the rotating arm (6), said rotating arm (6) having an end (61) rotatably constrained to said support upright (4) by said driving means (5), and a second end (62) connected close to the median point of a forked element (8), ending with a pair of ends (81, 82), lying on an axis O-O' substantially orthogonal to the axis S-S' of the rotating arm (6).

2. A fun park attraction (1) according to claim 1, characterized in that the axis of symmetry S-S' of the rotating arm (6) and the axis O-O' of the pair of ends (81, 82) of the fork (8) are coplanar.

3. A fun park attraction (1) according to claim 1 or 2, characterized in that said one pair of ends (81, 82) rotatably supports the two ends of a cross member (10), at the median point of which support means (12) for passengers (15) are rotatably constrained,
# EUROPEAN SEARCH REPORT

**Application Number**
EP 12 15 4073

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