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(54) **Slide**

Rutsche

Toboggan

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Description

[0001] The invention relates to a slide with a main sliding part with a first maximum inclination angle in the sliding direction, a transitional part in which the inclination angle is reduced to a second maximum inclination angle, and a run-out part with an inclination angle in the sliding direction at most equal to the second maximum inclination angle along the length of the run-out part.

[0002] With known slides the run-out part is straight seen from a top view. When the sliding part, seen from a top view, is curved up to the start of the straight run-out part, the user will be pressed in the curved part against the outside of the curve, at an angle which may well amount to 50°, and drop back to the middle of the track at the beginning of the straight run-out part. The distance which is needed to get in the middle of the track again in the straight part, depends from the velocity and the amount of curvature ahead of the straight part, but in practice usually amounts to about 2 meters, so that for safety's sake a transitional part of this length is present between the sliding part and the run-out part.

[0003] By his mass inertia the user, when located in the middle of the track, may slip to the other side and fall from the track if the track at that side has low or no side walls at all. On the one side this may result in that the user is more or less thrown against such a side wall, which can be painful, and on the other side that an user with a low velocity, for example by clothes with a rather high friction coefficient, comes to a standstill before the end of the run-out and can not leave the slide easily.

[0004] From US-A-4 865 311 a spiral slide with helical segments is known in which three separate parts can be recognized, which relates to different helical segments of the slide and not, however, to an explicit subdivision of the slide in parts with different sliding characteristics. This known spiral slide has in fact a sliding part of identical helical segments followed directly by a run-out part, consisting of an element that leads away from the central vertical column and forms a substantially straight run-out part, and has the above mentioned disadvantages.

[0005] The invention aims to provide a slide with a shorter run-out part than is usual at the moment, a run-out part in which swaying of the user is prevented and which permits the user to step out easily independent from the length of the sliding path in the run-out part.

[0006] Accordingly the invention provides that the inclination angle of the run-out part in the gliding direction is 10° at the most, that the run-out part has a by approximation circular arc shape in cross section, and is curved in one direction seen in a top view, the radius of curvature of the centre of the section, at least locally, includes an angle with the vertical of more than 30°, preferably about 45°, by which the normal force of a sliding body on the run-out part is increased and therewith the frictional force, and that the radius of curvature of the run-out part reduces in the direction to the end, in order to compensate partially for the loss in friction by the reduction of the sliding velocity.

[0007] Because with the invention the body of the user is forced always to one side in the run-out part, a larger braking force arises, because not only the gravitational force, but also the centrifugal force sees to it that the body is forced against the slide, resulting, with a constant friction coefficient, in a larger frictional force. Through this a slide with an equal sliding part can be shorter, which means a reduction of the terrain as well as of the material needed. Moreover the value of the experience with a slide according to the invention with the end emotion in the curved run-out part at least equals that of a for the other part similar known slides.

[0008] The feature that the run-out part is bend in one direction prevents swaying of the user in the run-out part itself.

[0009] In the run-out part the velocity usually reduces in the sliding direction and by that with constant curvature the centrifugal force, so that the radius of curvature has to decrease in the direction to the end to compensate at least partially the reduction of the centrifugal force.

[0010] The invention is suitable to be applied with tube-slides, with which at least a part is tube-shaped, as well as with gutter-slides. Also with tube-slides the run-out part usually is open at the top. With application of the invention it can be provided accordingly that the run-out part has a curved, by approximation circular arc shape in cross section, with which preferably the edge of the run-out part at the side, from which the curved shape curves away, is in a higher position than the other edge. This not only provides for a higher security when passing the run-out part, but also sees to it that the chance diminishes that bystanders enter the path of movement of a user of the slide, because that user is at one side of the run-out part and an edge at a higher position is present at that side.

[0011] With the above depicted embodiment of the invention it is preferred that the radius of curvature of the centre of the section, at least locally, includes an angle with the vertical of more than 30°, preferably about 45°.

[0012] Furthermore for a smooth transition between the sliding part and the run-out part the transitional part is curved in vertical direction and seen in a top view is curved in the same direction as the run-out part.

[0013] In the following the invention is elucidated on hand of the drawing in which;

fig.1 shows a top view of the end of a slide with a run-out part;
fig.2 shows a section of the run-out part along line II-II of fig.1, and
fig.3 shows a graph of the velocity as function of the location on the run-out part.

[0014] In fig.1 the end of a sliding part of a slide is indi-

cated in general with 1, a transitional part with 2 and a run-out part with 3.

[0015] The sliding part 1 is made in the usual manner and here consists of connected tube segments, which is known per se.

[0016] The transitional part is not, as usual, straight, but has a curvature in the same direction as the end of the sliding part 1.

[0017] At the end of the transitional part 2 a run-out part 3 is connected, of which a section is shown in fig.2 along line II-II in fig.1.

[0018] The run-out part is further provided with an edge 4, which consists of a tube with a cut, which is placed around the edge of the circular arc shaped plates of the run-out part 3 and are welded thereto.

[0019] As will be clear from fig.1 the curvature of the end of the sliding part 1, the transitional part 2 and the run-out part is directed in the same direction, namely directed to the left.

[0020] All along the point-dash line 5 the lowest point of the section of the slide is indicated, from which can be seen that this lowest point in the run-out part is shifted strongly to one side, as also will be clear from fig.2.

[0021] The inclination in the longitudinal direction of the slide is rather large in part 1 and may amount to 45°. In part 2 the inclination is reduced to maximum 10° and this value also holds for the entire run-out part 3. This inclination of the run-out part is mainly necessary to get a rapid drain of possible rain-water.

[0022] When a person slides down the slide, at the end of part 1 he will already be at the outer side of the slide, which also will be the case in parts 2 and 3.

[0023] In the run-out part 3, vide fig.2, a considerable increase in the frictional force will occur, because the normal is inclined at an angle of about 50° to the vertical, which means that the normal force of a body sliding along the path is increased with a factor 1,55. This results in a considerable shortening of the run-out part. Of course the centrifugal force is proportional to the square of the velocity, so that the increase of the friction rapidly decreases with the decrease in the velocity.

[0024] In fig.3 a graph is shown of the velocity of a body on the run-out part 3. With the dotted line "a" a case with a straight run-out part is indicated and with the full line "b" that of a run-out part according to the invention with a mean radius of curvature of 1,68 meter.

[0025] From the graph it shows that with application of the invention the run-out part can be shorter for about 2 meters.

[0026] The edge 4, located at the outer side, gives a reasonable protection for the person coming down the slide against body parts or the like of other users protruding into the slide path. Stepping out of the slide is easy because the inner parts of edge 4 are positioned low.

[0027] The invention provides the following advantages:

1) Because the sliding part is connected through a double curved (horizontal and vertical) transitional part to the run-out part, the transition is smooth and as good as free from shocks. Because a straight preceding part is not necessary, an extra centrifugal braking part can be introduced herewith, as a result of which the sliding part can be shorter.

2) By the additional velocity dependant centrifugal braking the run-out part can be shorter, which can lead to a better use of the space available.

3) A user with a low velocity can leave the run-out part easily at the beginning of that part.

4) The user of the slide, when in the run-out part, will remain better in his path if he touches a bystander.

5) The total slide can be shortened further because a shorter transitional part is needed.

[0028] It will be obvious that the invention can be applied with gutter-slides as well as with tube-slides. Also the invention can be applied with slides, which are to be used as escape route from higher parts of buildings, for example for handicapped people.

Claims

1. Slide with a main sliding part (1) with a first maximum inclination angle in the sliding direction, a transitional part (2) in which the inclination angle is reduced to a second maximum inclination angle, and a run-out part (3) with an inclination angle in the sliding direction at most equal to the second maximum inclination angle along the length of the run-out part (3), **characterized in that**, the inclination angle of the run-out part (3) in the gliding direction is 10° at the most, that the run-out part (3) has a by approximation circular arc shape in cross section, and is curved in one direction seen in a top view, the radius of curvature of the centre of the section, at least locally, includes an angle with the vertical of more than 30°, preferably about 45°, by which the normal force of a sliding body on the run-out part (3) is increased and therewith the frictional force, and that the radius of curvature of the run-out part (3) reduces in the direction to the end, in order to compensate partially for the loss in friction by the reduction of the sliding velocity.

2. Slide according to claim 1, **characterized in that**, the transitional part (2) is curved in vertical direction for a smooth transition between the sliding part (1) and the run-out part (3).

3. Slide according to claim 1-2, **characterized in that**, the transitional part (2) seen in a top view is curved in the same direction as the run-out part (3).

4. Slide according to claim 1-3, **characterized in that**,

the edge (4) of the run-out part (3) at the side from which the curved shape curves away is in a higher position than the other edge.

Patentansprüche

1. Rutsche mit einem Hauptrutschteil (1) mit einem ersten Maximalneigungswinkel in der Rutschrichtung, einem Uebergangsteil (2) in dem der Neigungswinkel reduziert wird bis einem zweiten Maximalneigungswinkel und einem Auslaufteil (3) mit einenem Neigungswinkel in der Rutschrichtung am höchsten gleich dem zweiten Maximalneigungswinkel der Länge des Auslaufteils (3) entlang, **dadurch gekennzeichnet** dass der Neigungswinkel des Auslaufteils (3) in der Rutschrichtung am höchsten 10° ist, dass der Auslaufteil (3) im Durchschnitt eine annähernd Kreisbogenform aufweist und gesehen im Oberansicht in einer Richtung gebogen ist, der Krummungsradius des Zentrums des Durchschnitt schliesst, wenigstens ortlich, einen Winkel ein mit der Vertikale von mehr als 30°, vorzugsweise etwa 45°, wodurch die Normalkraft eines rutschenden Körpers auf den Auslaufteil (3) erhöht wird und damit die Reibungskraft und dass der Krummungsradius des Auslaufteils (3) zur Endrichtung abnimmt um teilweise die Reibungsverlust zu kompensieren durch Ermässigung der Rutschgeschwindigkeit.

2. Rutsche nach Anspruch 1, **dadurch gekennzeichnet**, dass der Uebergangsteil (2) in vertikaler Richtung gebogen ist für einen fliessenden Uebergang zwischen dem Rutschteil (1) und dem Auslaufteil (3).

3. Rutsche nach Anspruch 1-2, **dadurch gekennzeichnet**, dass der Uebergangsteil (2) in Oberansicht, in derselben Richtung wie den Auslaufteil gebogen ist.

4. Rutsche nach Anspruch 1-3, **dadurch gekennzeichnet**, dass der Rand (4) des Auslaufteils (3) an der Seite wo die gebogene Form herabbiegt, in einer höheren Position liegt als den anderen Rand.

Revendications

1. Glissoire avec une partie glissante principale (1) avec un premier angle d'inclination maximal dans la direction de glissement, une partie de transition (2) dans laquelle l'angle d'inclination est réduit à un deuxième angle d'inclination maximal, et une partie d'arrêt (3) avec un angle d'inclination dans la direction de glissement tout au plus égal au deuxième angle d'inclination maximal le long de la longueur de la partie d'arrêt (3) **caractérisé en ce que** l'angle d'inclination de la partie d'arrêt (3) est 10° tout au plus dans la direction de glissement, que la partie d'aarrêt (3) dans la section transversale présente par approximation une forme d'un arc de cercle et vu dans une vue par-dessus ladite partie est courbée dans une direction, le rayon de la courbe du centre de la section, au moins localement, inclus un angle avec la verticale de plus que 30°, de préférence d'environ 45°, par lequel la force normale d'un corps glissant sur la partie d'arrêt (3) est augmentée et avec cela la force de friction, et que la rayon de la courbe de la partie d'arrêt (3) réduit dans la direction vers l'extrémité, afin de compenser partiellement la perte de friction par la réduction de la vitesse de glissement.

2. Glissoire suivant la revendication 1, **caractérisé en ce que** la partie de transition (2) est courbée dans la direction verticale pour une transition graduelle entre la partie glissante (1) et la partie d'arrêt (3).

3. Glissoire suivant la revendication 1-2, **caractérisé en ce que** la partie de transition (2), vu dans une vue par-dessus, est courbée dans la même direction comme la partie d'arrêt.

4. Glissoire suivant la revendication 1-3, **caractérisé en ce que** la bordure (4) de la partie d'arrêt (3) à la côté dont la forme courbée fait une courbe, est dans une position plus haut que la autre bordure.

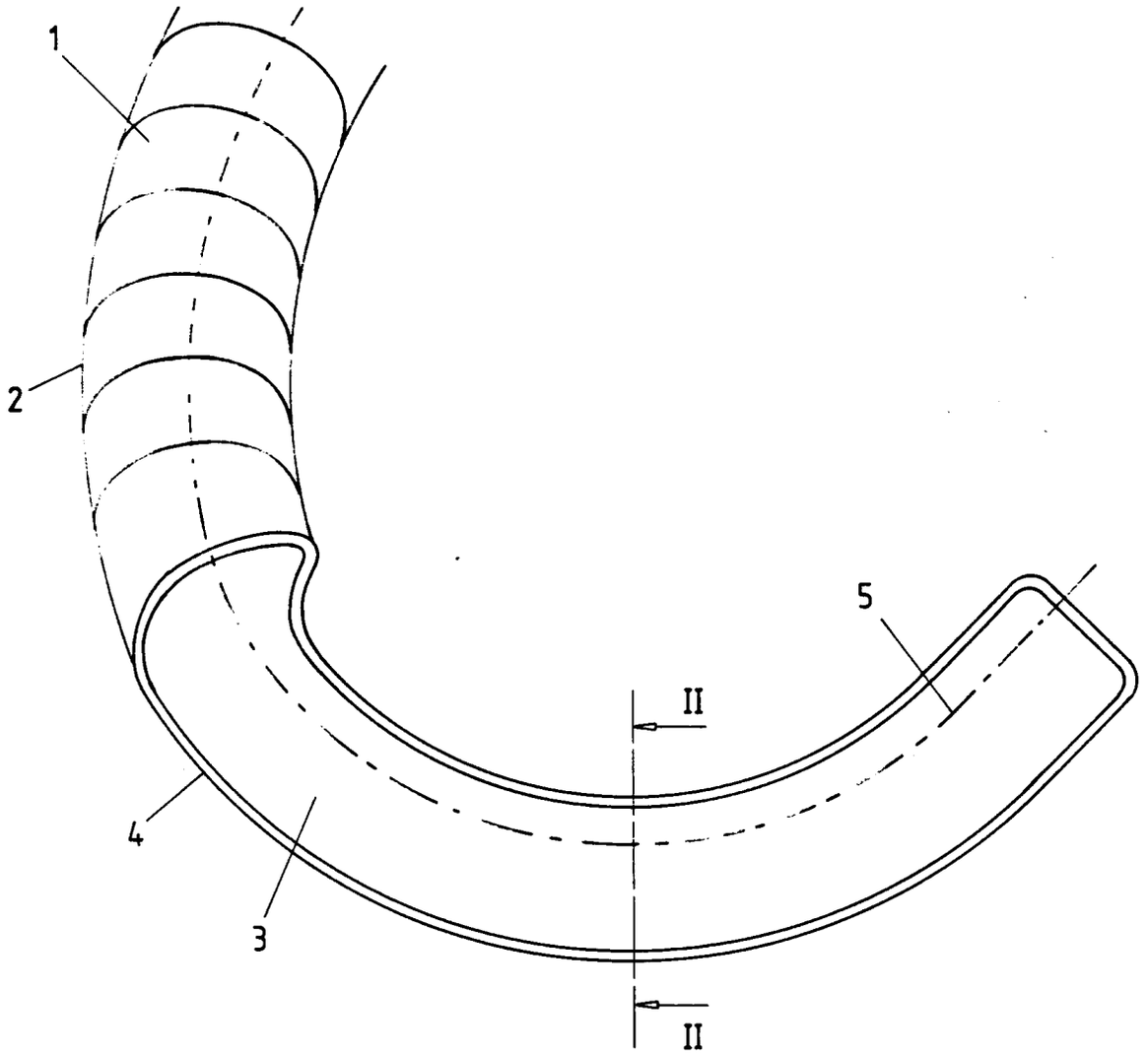

FIG. 1

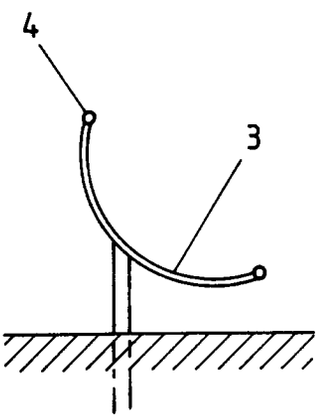

FIG. 2

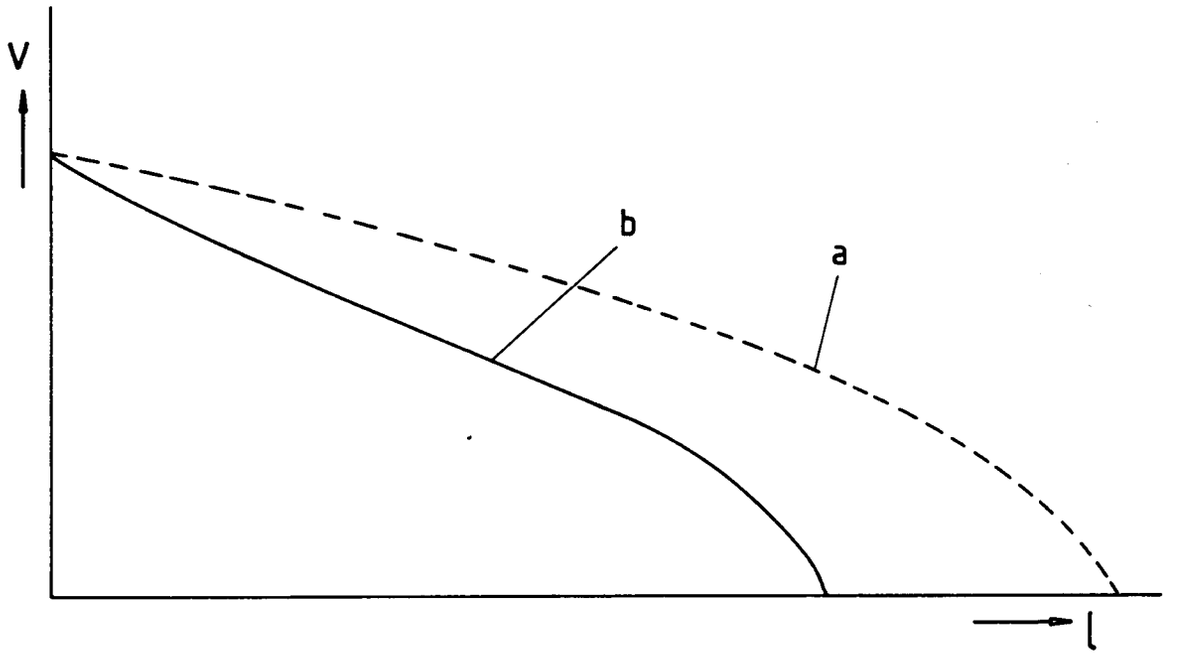

FIG. 3