(19) DANMARK

(10) **DK/EP 4062989 T3**

Patent- og Varemærkestyrelsen

(12) Oversættelse af europæisk patentskrift

(51) Int.Cl.: ***A 63 G 21/10 (2006.01)***

(45) Oversættelsen bekendtgjort den: **2024-09-16**

(80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2024-07-17**

(86) Europæisk ansøgning nr.: **22161963.8**

(86) Europæisk indleveringsdag: **2022-03-14**

(87) Den europæiske ansøgnings publiceringsdag: **2022-09-28**

(30) Prioritet: **2021-03-25 DE 102021107558**

(84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(73) Patenthaver: **Aquarena Holding GmbH, Am Mühlweg 8, 71131 Jettingen, Tyskland**

(72) Opfinder: **BRAUN, Rainer, , 71106 Magstadt, Tyskland**
ZEBISCH, Florian, , 73540 Heubach-Lautern, Tyskland

(74) Fuldmægtig i Danmark: **Zacco Denmark A/S, Arne Jacobsens Allé 15, 2300 København S, Danmark**

(54) Benævnelse: **Rutsjebane, især vandrutsjebane**

(56) Fremdragne publikationer:
DE-U1- 202007 014 719
US-A1- 2002 142 851
US-A1- 2005 075 180
US-A1- 2022 305 394

The invention relates to a slide, in particular a water slide, with a starting zone and a landing zone as well as a slide path extending therebetween with a slide surface which comprises several slide sections.

US 2005/0075180 A1 discloses a water slide which, starting from a starting zone, comprises a run-up section followed by a slide reversal element comprising a first slide connection connected to the run-up section. Following the first slide connection, an uphill section is provided, through which the slide direction is reversed so that the sliding person is transferred to a second slide connection adjacent to the first slide connection in order to enter a subsequent slide section. This arrangement may be repeated several times until the sliding person enters a run-out section leading to the landing zone, starting from the last slide direction reversal element. At each slide reversal element, there is a change in the slide direction.

US 2002/0142851 A discloses a white-water slide in which one or more persons can experience a slide ride on a tyre. This slide comprises, starting from the starting zone, a first run-up section which opens into a switch. The switch has a second slide connection adjacent to the first slide connection and a third slide connection opposite the first two. This third slide connection is elevated compared to the first and second slide connections. If the sliding person enters the switch with a low kinetic energy, he or she does not reach the elevated third slide connection, but slides in the opposite direction via the second slide connection into a further slide section. If the sliding person has sufficient kinetic energy, he or she can continue to slide feet first and enters a bonus section via the third slide connection, which leads into a subsequent second switch. The second slide connection of the preceding switch also opens into this second switch. The sliding person can thus continue the slide either feet first or head first. In the run-out section, the sliding person enters the landing zone either head first or feet first, depending on the particular kinematic energy.

Entering the landing zone by a sliding person in a head-first sliding position creates a risk of injury as the sliding person cannot see if there are still people located in the landing zone.

The object of the invention is to propose a slide, in particular a water slide, by means of which a sliding person can pass through a slide path with a plurality of slide sections connected by switchs, wherein the sliding directions in individual slide sections can deviate from one another and it is ensured, irrespective of the entrained kinematic energy of the sliding person, that the sliding person slides feet first into the landing zone.

This object is achieved by a slide in which a slide path with a plurality of slide sections is provided between a starting zone and a landing zone, wherein two mutually associated switchs or a plurality of switchs mutually associated in pairs are provided in the slide path and the first switch of the mutually associated switchs in the slide path is connected to a run-up section leading away from the starting zone or to a slide section leading to the switch and having a first slide connection, and the second switch of the mutually associated switchs in the slide path is connected to the second slide connection to the run-out section or to a slide section leading away. The switch comprises a first and second slide connection oriented adjacently to each other and a third slide connection opposite or remote therefrom, wherein the opposite or remote third slide connection is elevated relative to the first and second slide connection when viewed in the vertical direction. The first of the two mutually associated switchs can transfer the sliding person into one of the two outgoing slide sections, which are connected to the second and third slide connection. These outgoing slide sections can be an alternative section or a bonus section. This same orientation is provided with respect to the first and second slide connection and the opposite third slide connection at the second of the mutually associated switchs. Preferably, it is provided that at each of the first and second switchs, the first slide connection is connected to an incoming slide section. The second slide connection of the first and second switchs or of the two switchs mutually associated in

pairs is connected to an outgoing slide section in each case. An interchange in the connection of the slide section takes place with regard to the third slide connection. At the first switch, the third slide connection is connected to an outgoing slide section, wherein this outgoing slide section becomes the incoming slide section and is connected to the second switch in the third slide connection. The arrangement of the two mutually associated switchs makes it possible for the sliding person, who leaves the starting zone feet first and slides feet first into the run-up section leading away from the starting zone, to enter the run-up section feet first after passing through the slide path comprising several slide sections, irrespective of whether a bonus section or an alternative section is passed through, and thereby to slide into the landing zone with a view of the landing zone. This allows for increased safety in such slides.

Insofar as further switchs are provided between the first and last mutually associated switchs within the slide, the arrangement of further switchs provided in between requires that these are mutually associated in pairs, so that each two additional switchs are oriented analogously to the two switchs already provided. In this way, any number of slide sections with bonus section and alternative section can be formed, wherein again an orientation of the sliding person can be forced so that he or she slides feet first into the landing zone.

According to a preferred embodiment of the invention, it is provided that the switch has a rectilinear continuous slide surface between the first and third slide connection or between the second and third slide connection. This may allow a preferred direction in terms of the slide direction through the switchs. Alternatively, the switch may have a Y-shaped course of the slide surface between the first and second slide connection and the opposite third slide connection.

According to an advantageous embodiment of the invention, it is provided that the first of the mutually associated switchs is connected by the first slide connection to an incoming slide section and the second slide connection is connected to an outgoing slide section, in particular

an alternative section, and the third slide connection is connected to a further outgoing slide section, in particular a bonus section. The bonus section differs from the alternative section in that a longer slide section is provided, possibly with additionally installed adventure elements. However, due to the ascending section from the mouth region of the switch to the third slide connection, the sliding person needs to slide with a high kinetic energy in order to reach the bonus section.

The further switch associated in a pair is preferably connected by the second slide connection to an outgoing slide section, and the first slide connection to an incoming slide section. This incoming slide section can be the end of the alternative section. The third slide connection is connected to an incoming slide section. This incoming slide section can be the end of the bonus section.

Furthermore, it is preferably provided that the two mutually associated switchs are connected to each other by a slide section, in particular a bonus section, by the slide section arranged between the switchs being connected on the one hand to the third slide connection of the first switch and on the other hand to the third slide connection of the second switch. In this way, it can be ensured that the sliding person slides feet first through both the first and the second switch and thus enters the landing zone feet first.

In particular, it is provided that a bead-like elevation is provided between the first and second slide connections of the switch, which bead-like elevation decreases at least in the direction of the opposite third slide connection and preferably transitions into the slide surface in the mouth region of the switch. This enables a controlled transfer of the sliding person from the entry into the switch to the exit from the switch via the various slide connections.

Furthermore, it is preferably provided that the third slide connection is provided at the end of the ascending section and/or a superelevation or a crest. This enables the sliding person to slide over the elevation or

crest only if there is sufficient kinetic energy, in order to then preferably enter a bonus section.

Furthermore, it is preferably provided that the switch between the two adjacent first and second slide connections and the opposite or remotely arranged third slide connection has a curved or arc-shaped course. This can provide a further enhancement of the experience.

In particular, it is provided that the third slide section is oriented at an angle of between 45° and 270°, preferably between 90° and 180°, with respect to the first and second slide connection, wherein the curved, curvilinear or arcuate or even elliptical course of the ascending section can be formed therebetween.

Advantageously, it is provided that the slide is designed as a body slide.

Furthermore, it is preferably provided that the slide is exposed to a water film, a water precipitation or spray mist. This makes it possible to achieve a sliding film between the slide surface and the sliding person. It is also possible that the sliding speed along the slide path can be controlled depending on the wetting of the slide surface.

The invention and other advantageous embodiments and developments thereof are described and explained in greater detail hereinafter with reference to the examples shown in the drawings. The features to be taken from the description and the drawings can be used individually or in any combination in accordance with the invention. The drawings show:

Figure 1 a schematic view of a slide,

Figure 2 a schematic side view of the slide according to Figure 1,

Figure 3 a perspective view of a switch,

Figure 4 a perspective view of the switch according to Figure 3 in an open embodiment,

Figure 5 a schematic view from above of the embodiment according to Figure 3,

Figure 6 a schematic view from above of the switch according to an alternative embodiment to Figure 5,

Figure 7 a schematic view from above of another alternative embodiment of the switch,

Figure 8 a schematic view from above of an alternative course of the slide section of the slide to Figure 1, and

Figure 9 a schematic view of a slide according to Figure 1 with an alternative embodiment of a switch.

Figure 1 shows a schematic view from above of a slide 11, in particular a water slide. Figure 2 shows a schematic side view of the slide 11 according to Figure 1. This Figure 2 shows a height profile of the slide 11. This slide 11 can be what is known as a dry slide, in which the sliding person slides directly along the slide surface or slides by means of a mat or carpet. In particular, the slide 11 is designed as a water slide, wherein the sliding person slides directly on a film of water on a slide surface 19 of the slide 11. This slide 11 may also be designed as a tyre slide, wherein the slide surface is limited in width such that only one person sitting on a tyre or two persons sitting on a double tyre one behind the other can slide along the slide path 11. A change of direction in the orientation of the sliding person along and within a slide section 21 is not possible. The slide 11 is not designed as a tyre slide in which one or more persons can slide along the slide path on a tyre and can rotate at will about the vertical axis of the tyre or the slide element during the slide ride.

The slide 11 comprises a starting zone 12, in which the sliding person prepares for the slide ride. From the starting zone 12, the sliding person enters a descending run-up section 14. In the starting zone 12, the person aligns himself or herself feet first in order to enter the run-up section 14. The run-up section 14 forms part of a slide path 16, which ends in a run-out section 17. The run-out section 17 leads into a landing zone 18. This landing zone 18 can be a pool filled with water. This pool preferably has a low water level, so that on the one hand a gentle, safe landing is possible and on the other hand it is easy to leave the pool on foot.

The slide path 16 comprises slide sections 21 with a slide surface 19 (Figure 3), which can be flat or curved or recessed transversely to the slide direction. The slide section 21 can be designed as a closed channel 46 or tube. Within the slide path 16, several different slide sections 21 can be provided so that the sliding person can slide through different slide routes between the starting zone 12 and the landing zone 18 depending on his or her kinetic energy. This increases the fun and enhances the experience.

For example, following the run-up section 17, a slide section 21 can be provided which is curved or helical. This curved section can be, for example, 180°, 270°, 360° or a multiple thereof.

A switch 23 is connected to the run-up section 14 or to the first slide section 21. This switch 23 is shown schematically in an enlarged view in Figure 3. The switch 23, 30 shown in Figure 3 is closed. Figure 4 shows an alternative embodiment of the switch 23, 30 according to Figure 3, this time in an open design. A tube portion covering the slide surface 19 to form a closed tube or channel, as shown in Figure 3, can also be omitted according to the embodiment in Figure 4. This switch 23 according to Figure 3 comprises a first slide connection 24 and adjacent thereto a second slide connection 25. Opposite the first and second slide connection 24, 25, there is provided a third slide connection 27. This switch 23 is what is known as a Y-switch. Viewed vertically, the first slide connection 24 is located between the second slide connection 25 and the third

slide connection 27. The third slide connection 27 is elevated relative to the first slide connection 24. Alternatively, it can be provided that the second slide connection 25 is elevated relative to the first slide connection 24.

The three slide connections 24, 25, 27 form a mouth region 34 within the switch 23. A bead-like elevation 28 is formed between the first and second slide connection 24, 25, which lowers in the direction of the mouth region 34 and preferably transitions into the slide surface 19 in the mouth region 34. Starting from the mouth region 34, an ascending section 35 follows in the direction of the third slide connection 27. This ascending section 35 can transition directly into the third slide connection 27. Alternatively, a crest 29 or an elevation can be formed between the ascending section 35 and the third slide connection 27. Thus, the slide connection 27 is provided slightly below an apex of the crest 29.

This switch 23 according to Figure 3 is integrated into the slide path 16 according to Figure 1 in that the first slide connection 24 is connected to the run-up section 14 or an incoming slide section 21. The third slide connection 27 transitions into an outgoing slide section 21, in particular a bonus section 31. The second slide connection 25 transitions into a further outgoing slide section 21, in particular an alternative section 32. The bonus section 31 and the alternative section 32 are connected to a further switch 30. The alternative section 32 is connected to the first slide connection 24 of the second switch 30. The bonus section 31 is connected to the third slide connection 27 of the second switch 30. Another slide section 21 leads from the second slide connection 25 of the second switch 30 or is directly connected to the run-out section 17.

The first switch 23 and the second switch 30 can have the same design. This arrangement and orientation of the first switch 23 and the second switch 30 enables the sliding person, who enters the run-up section 14 feet first, to also enter the run-out section 17 and thus the landing zone 18 in a controlled manner, feet first.

This controlled orientation of the sliding person is independent of whether the sliding person enters the bonus section 31 or alternative section 32 from the first switch 23. The second switch 30 reverses the sliding direction that is caused by the first switch 23 if the sliding person slides into the alternative section 32, again in the sliding direction in the second switch 30, so that the sliding person slides feet first into the run-out section 17.

In order to illustrate two possible slide routes along the slide path 16, the arrangement and orientation of the switchs 23, 30 will be explained once again with reference to Figure 2. The position and height of the switch 23 is oriented in such a way that the first slide connection 24, through which the sliding person enters, is at height A below the end of the ascending section 35 of the switch 23 or the third slide connection 27. This is at height B. The second slide connection 25 is located at height C below the first slide connection 24. This results in two variants. The sliding person enters the first switch 23 feet first with a high kinetic energy. In this case, this person slides feet first over the ascending section 35 and, as applicable, the crest 29 and reaches the third slide connection 27. Subsequently, the sliding person enters the bonus section 31 feet first.

If the kinetic energy of the person sliding feet first is not sufficiently high when entering the first slide connection 24 of the first switch 23, this person slides backwards, or head first, into the second slide connection 25 and enters the alternative route 32 head first.

Irrespective of the kinetic energy of the sliding person in the alternative section 32, this person in turn enters the second switch 30 via the first slide connection 24. Since the third slide connection 27 is elevated compared to the first slide connection 24, as is the bonus section 31 connected to it, the person sliding head first into the second switch 30 then enters the second slide connection 25, which is connected to the outgoing slide section 21 or to the run-out section 17, feet first. The two mu-

tually associated switchs 23, 30 enable the orientation of the sliding person so that he or she arrives at the landing zone 18 feet first.

The sliding person, who has entered the bonus section 31 feet first, continues to slide through the second switch 30 feet first and arrives at the outgoing slide section 21 or the run-out section 17 and feet first in the landing zone 18.

According to a further embodiment of the slide 11 in Figures 1 and 2, it may be provided that further slide elements can be provided between the first switch 23 and the second switch 30 or between the first and the last switch 23, 30 in the slide 16. Provided that further bonus and alternative sections 31, 32 are planned, it is necessary that the further switchs interposed between the first and second or between the first and the last switch 23, 30 are likewise arranged in pairs and, moreover, are oriented in the same way. The controlled orientation of the sliding person can thus be achieved, so that when the person starts from the starting zone 12 feet first, he or she also enters the landing zone 18 feet first.

Figure 5 shows a schematic view of the switch 23, 30 according to Figures 3 or 4. In this embodiment of the switch 23, it is provided that a rectilinear course of the slide surface 19 is formed between the first slide connection 24 and the third slide connection 27. This means that there is a preferred direction between the first slide connection 24 and the third slide connection 27 when sliding through the switch 23.

The bead-like elevation 26 is formed between the first and second slide connections 24, 25, which ensures that when the sliding person enters via the first slide connection 24, if there is insufficient kinetic energy to reach the third slide connection 27, the switch 23 is exited via the second slide connection 25.

Figure 6 shows an alternative embodiment of Figure 5. In this embodiment, the slide surface 19 is designed to run in a straight line between the second slide connection 25 and the third slide connection 27. Thus,

the preferred direction for sliding through this switch 23, 30 is between the second slide connection 25 and the third slide connection 27.

Figure 7 shows another alternative embodiment of the switch 23, 30 to Figures 5 and 6. The slide connections 24, 25 open quasi identically into the switchs 23, 30 and merge into a common slide surface 19, which leads to the third slide connection 27.

Figure 8 shows a schematic view from above of an alternative embodiment of the slide 11 to Figure 1. The structure of the slide 11 according to Figure 8 corresponds to that according to Figures 1 and 2 with regard to the individual components, and therefore reference can be made to said figures. In the view from above of the slide course of the slide 11 according to Figure 1, the switchs 23, 30 are oriented for example in the same way, i.e. the slide connections 24, 25 both point to the left and the slide connection 27 to the right. In the embodiment of the slide 11 according to Figure 8, the orientation of the switchs 23, 30 can also be opposite. This can be seen from the view from above of the slide 11 according to Figure 8.

Both slides 11 have in common that in each case the third slide connection 27 of the switchs 23, 30 are connected to a bonus section 31.

Figure 9 shows a schematic view from above of a further alternative embodiment of the slide 11 to Figures 1 and 8. This embodiment differs in particular in that the contour or geometry of the switchs 23, 30 is designed differently from that of the switchs 23, 30 shown in Figures 1 and 8. In this embodiment, it is provided that the third slide connection 27 is oriented at an angle α of, for example, 180° to the first and second slide connections 24, 25. A curved slide surface 19 or a curved slide surface 19 is formed therebetween. This angle α may have an angular range of 45 to 270°. As an alternative to the arcuate course of the slide section between the first and second slide connection 24, 25 and the third slide connection 27, a curved or elliptical course can also be provided. In this way, the courses of the individual slide sections can be designed in a

variety of ways. Incidentally, the previous explanations also apply to this slide 11 as shown according to Figure 9.

The slide sections 21 and/or the switchs 23, 30 can be designed as closed tubes. These closed tubes can be made of plastic. These tubes can be made of opaque materials. Portions of the tubes that are transparent in part, in some sections or in full may also be provided.

Patentkrav

1. Rutsjebane, især vandrutsjebane,

- med en startzone (12) og en landingszone (18), mellem hvilke der strækker sig mindst en rutsjebane (16) med en rutsjeflade (19), som omfatter en indløbssektion (14), der fører væk fra startzonen (12), og en udløbssektion (17), der fører ind i landingszonen (18),
- med en flerhed af rutsjesektioner (21) af rutsjebanen (16), der er tilvejebragt mellem anløbssektionen (14) og udløbssektionen (17),
- med mindst en omskifter (23, 30), der er anbragt i rutsjebanen (16), ved hjælp af hvilken en indgående rutsjesektion er opdelt i en flerhed af udgående rutsjesektioner (21), eller en flerhed af indgående rutsjesektioner (21) samles til en udgående rutsjesektion (21),
- hvor omskifteren (23, 30) har en første rutsjeforbindelse (24) og ved siden af denne en anden rutsjeforbindelse (25), som begge er placeret over for en tredje rutsjeforbindelse (27) eller i en afstand derfra, og et mundingsområde (34) er dannet mellem den første og anden og den tredje rutsjeforbindelse (27), hvor den tredje rutsjeforbindelse (27), set i lodret retning, er hævet i forhold til den første og anden rutsjeforbindelse (24, 25) og med udgangspunkt i mundingsområdet (34) dannes en opadgående sektion (35) i retning af den tredje rutsjeforbindelse (27),

kendetegnet ved, at

- to eller flere omskiftere (23, 30), der er indbyrdes og parvis forbundne, er tilvejebragt i rutsjebanen (16),
- den første omskifter (23) af de indbyrdes forbundne omskiftere (23, 30) i rutsjebanen (16) er forbundet med anløbssektionen (14) eller til rutsjesektionen (21), der fører til omskifteren (23) ved hjælp af den første rutsjeforbindelse (24), og

- den anden omskifter (30) af de indbyrdes forbundne omskiftere (23, 30) i rutsjebanen (16) er forbundet med den anden rutsjeforbindelse (25) til udløbssektionen (17) eller til rutsjesektionen (21), der fører væk fra den anden omskifter (30).

2. Rutsjebane ifølge krav 1, **kendetegnet ved, at** omskifteren (23, 30) mellem den første og tredje rutsjeforbindelse (24, 27) eller mellem den anden og tredje rutsjeforbindelse (25, 27) har en rutsjeflade (19), som er kontinuerlig i en lige linje.

3. Rutsjebane ifølge et af kravene 1, **kendetegnet ved, at** omskifteren (23, 30) mellem den første og anden rutsjeforbindelse (24, 25) og den modstående tredje rutsjeforbindelse (27) har et Y-formet forløb af rutsjefladen.

4. Rutsjebane ifølge et af de foregående krav, **kendetegnet ved, at** den første omskifter (23) af de indbyrdes forbundne omskiftere (23, 30) er forbundet med den første rutsjeforbindelse (24) til den indgående rutsjesektion (21), og den anden rutsjeforbindelse (25) er forbundet med den udgående rutsjesektion (21), især alternative sektion (32), og den tredje rutsjeforbindelse (27) er forbundet med den yderligere udgående rutsjesektion (21), især bonussektion (31).

5. Rutsjebane ifølge et af de foregående krav, **kendetegnet ved, at** den anden omskifter (30) af de indbyrdes forbundne omskiftere (23, 30) er forbundet med den anden rutsjeforbindelse (25) til den udgående rutsjesektion (21), og den første rutsjeforbindelse (24) er forbundet med den indgående rutsjesektion (21), især den alternative sektion (32), og den tredje rutsjeforbindelse (27) er forbundet med den indgående rutsjesektion (21), især bonussektionen (31).

6. Rutsjebane ifølge et af de foregående krav, **kendetegnet ved, at** de to indbyrdes forbundne omskiftere (23, 30) er forbundet med hinanden ved hjælp af

en rutsjesektion (21), især bonussektionen (31), hvor rutsjesektionen (21) er forbundet med den tredje rutsjeforbindelse (27) af den første omskifter (23) og med den tredje rutsjeforbindelse (27) af den anden omskifter (30).

7. Rutsjebane ifølge et af de foregående krav, **kendetegnet ved, at** omskifteren (23, 30) mellem den første og anden rutsjeforbindelse (24, 25) har en vulstformet forhøjning (28), som aftager i retning af den tredje rutsjeforbindelse (27) og går fortrinsvis over i rutsjefladen (19) i mundingsområdet (34) af omskifteren (23, 30).

8. Rutsjebane ifølge et af de foregående krav, **kendetegnet ved, at** der er tilvejebragt en kam (29) eller forhøjning mellem den opadgående sektion (35) og den tredje rutsjeforbindelse (27) eller efter rutsjeforbindelsen (27) i rutsjesektionen (21).

9. Rutsjebane ifølge et af de foregående krav, **kendetegnet ved, at** der er tilvejebragt et buet, ovalt eller buet forløb mellem den tilstødende første og anden rutsjeforbindelse (24, 25) og den modstående tredje rutsjeforbindelse (27), og fortrinsvis er den tredje rutsjeforbindelse (27) justeret i en vinkel på mellem 45° og 270°, fortrinsvis 90° til 180°, i forhold til den første og anden rutsjeforbindelse (24, 25).

10. Rutsjebane ifølge et af de foregående krav, **kendetegnet ved, at** rutsjebanen (16) er belagt med en vandfilm, vandudfældning eller sprøjtetåge.

Fig.1

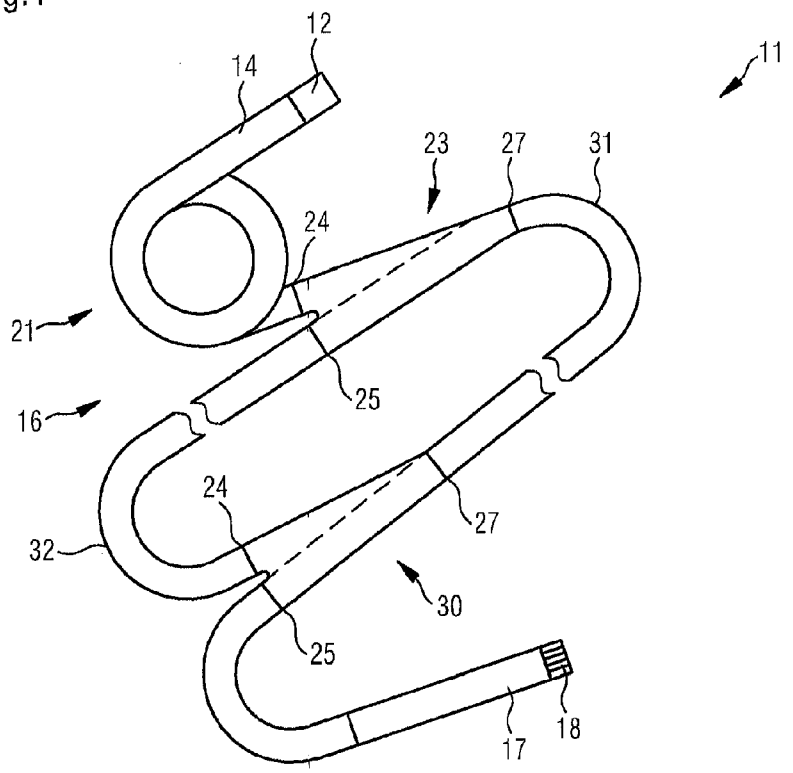

12
14
11
23
27
31
24
21
25
16
24
27
32
30
25
17
18

Fig.2

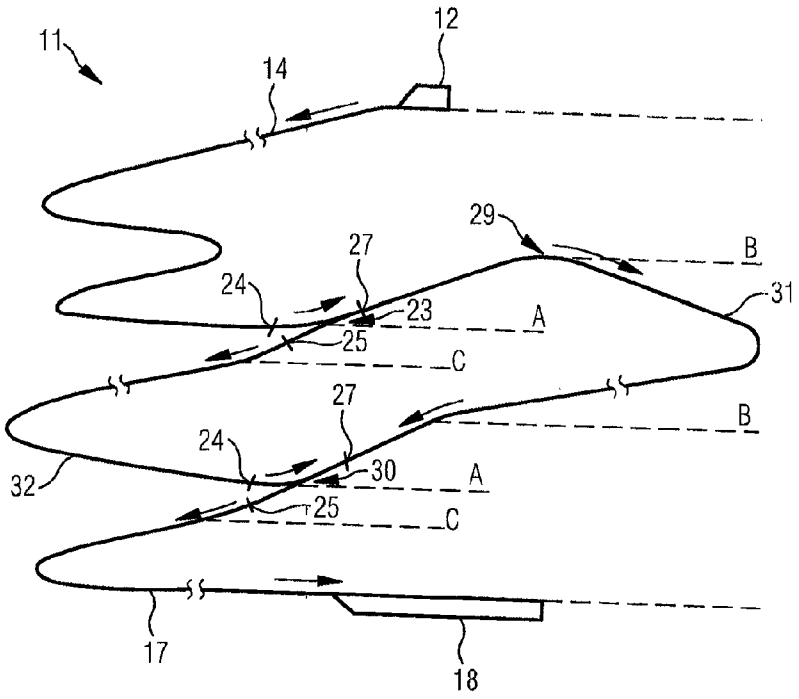

11
12
14
29
27
B
24
23
A
31
25
C
27
B
24
30
A
32
25
C
17
18

Fig.3

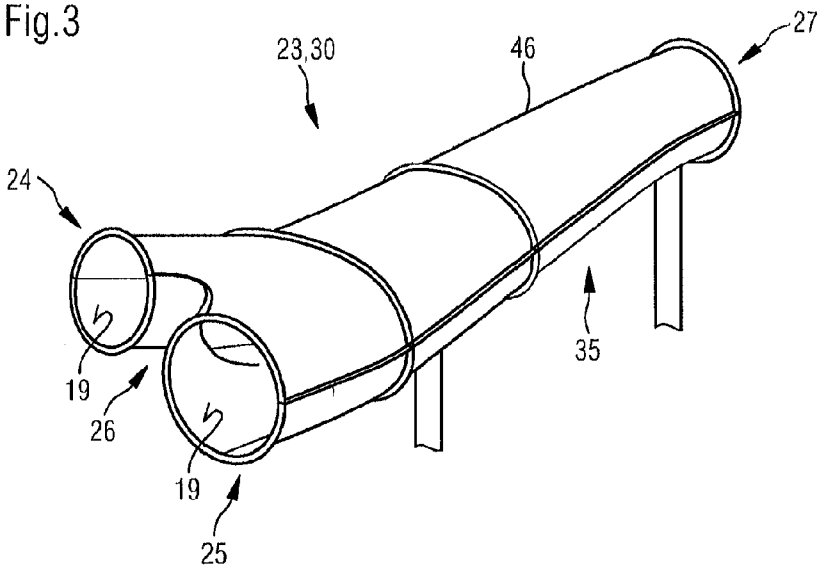


Fig.4

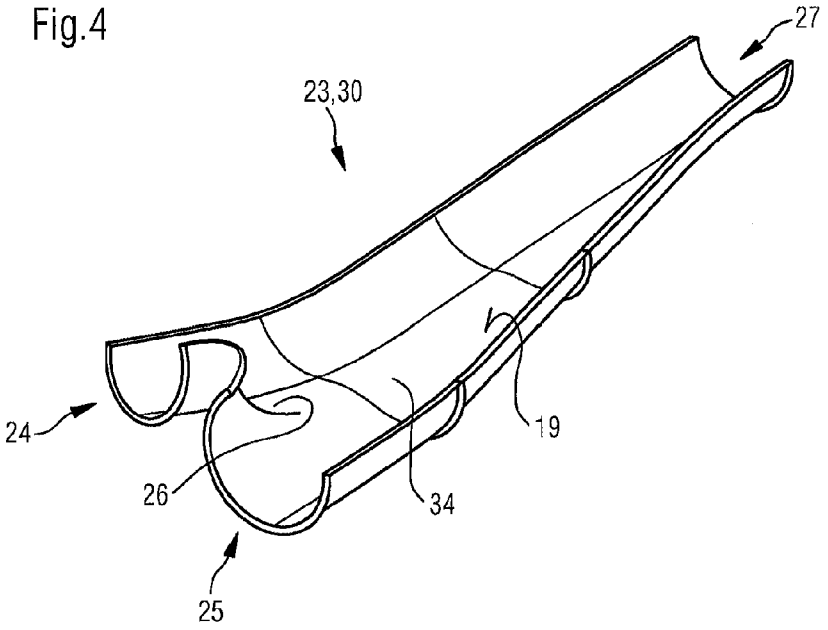


Fig.5

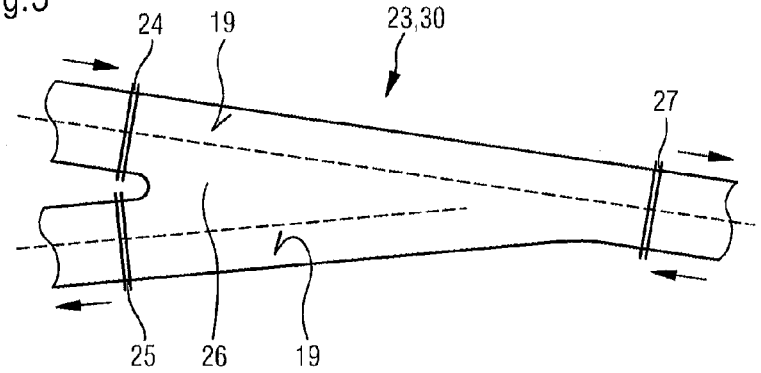


Fig.6

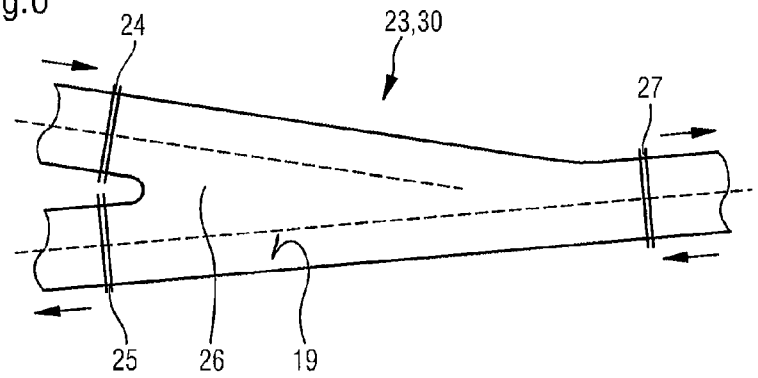


Fig.7

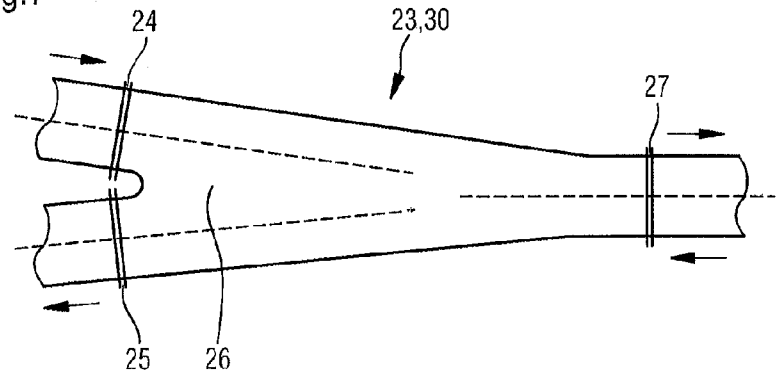


Fig.8

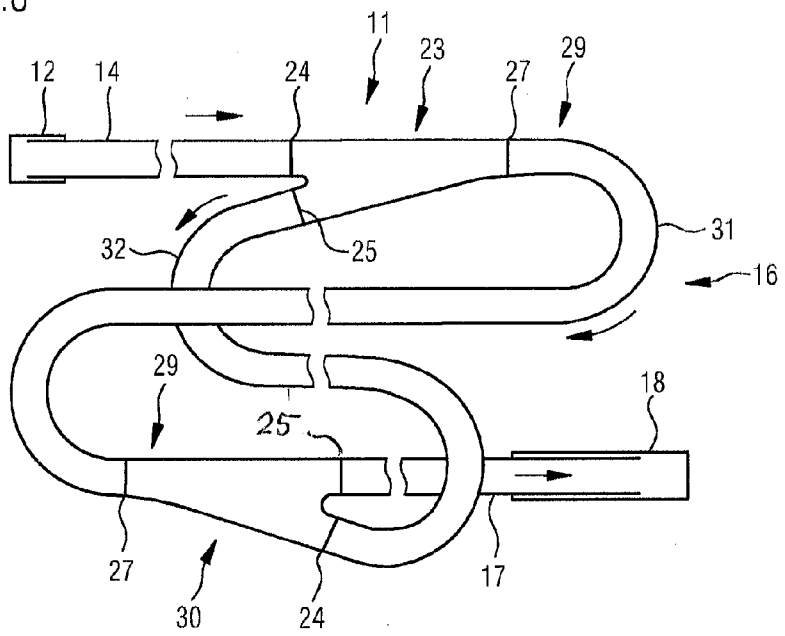
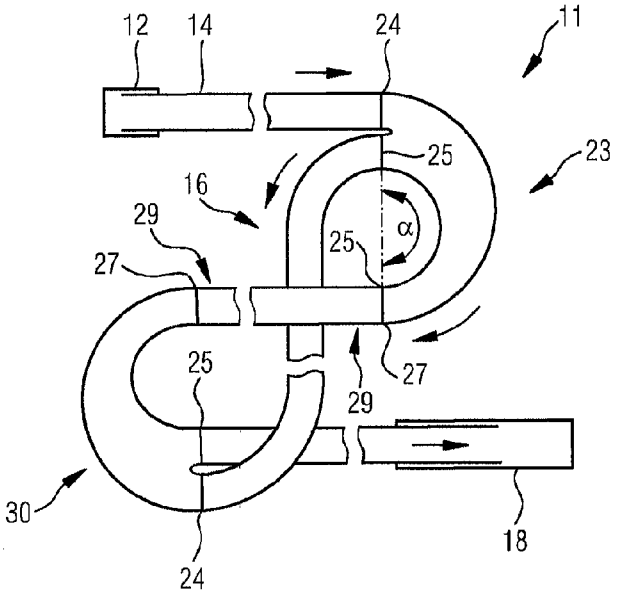

11
12
14
24
23
27
29
31
32
25
16
29
25
18
27
30
24
17

Fig.9


12
14
24
11
25
23
16
29
α
25
27
25
29
27
30
18
24