(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 268 525 B2**

(12) **NEW EUROPEAN PATENT SPECIFICATION**
After opposition procedure

(45) Date of publication and mention of the opposition decision:
16.03.2022 Bulletin 2022/11

(45) Mention of the grant of the patent:
01.01.2014 Bulletin 2014/01

(21) Application number: **09734480.8**

(22) Date of filing: **22.04.2009**

(51) International Patent Classification (IPC):
B61B 12/02 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B61B 12/02

(86) International application number:
PCT/EP2009/054805

(87) International publication number:
WO 2009/130239 (29.10.2009 Gazette 2009/44)

(54) CABLE TRANSPORTATION SYSTEM

KABELTRANSPORTSYSTEM

SYSTÈME DE TRANSPORT PAR CÂBLE

(84) Designated Contracting States:
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 SE SI SK TR

(30) Priority: **24.04.2008 IT MI20080757**

(43) Date of publication of application:
05.01.2011 Bulletin 2011/01

(73) Proprietor: **LEITNER S.p.A.**
Vipiteno (BZ) (IT)

(72) Inventor: **OBEXER, Stephan**
39030 Vandoies Di Sopra (IT)

(74) Representative: **Eccetto, Mauro et al**
Studio Torta S.p.A.
Via Viotti, 9
10121 Torino (IT)

(56) References cited:
EP-A- 0 207 850
EP-A2- 1 227 022
WO-A-2006/130030
FR-A- 2 604 138
FR-A- 2 823 482
GB-A- 191 327 151

EP 2 268 525 B2

Description

TECHNICAL FIELD

[0001] The present invention relates to a cable transportation system.

[0002] More specifically, the present invention relates to a cable transportation system in accordance with the preamble of claim 1.

BACKGROUND ART

[0003] In known cable transportation systems, see for example GB-A-27,151, the supporting cable is located over the draw cable, and the clamp is fitted to an arm, which extends downwards from the trolley and is designed so that, when the trolley runs along the idler, the draw cable is detached from the idler rollers along a suspension portion, of which a central part is located at the clamp, and two straight lateral parts extend from the clamp towards the rollers.

[0004] In known cable transportation systems, the idler rollers are cylindrical, and each have a circumferential groove to guide the draw cable, and is fitted to a fixed carrier to rotate idly about a respective normally horizontal axis.

[0005] In known cable transportation systems of the above type - i.e. in which the idler rollers are distributed in space along a first trajectory, the horizontal projection of which extends along a first path having a first curved intermediate portion, and the shoe guides the supporting cable along a second trajectory, the horizontal projection of which extends along a second path having a second curved intermediate portion - the first and second path are normally parallel, i.e. are the same shape.

[0006] Such a solution has potential drawbacks, in that, as the trolley runs along the curved intermediate portion of the second path, the clamp runs along the curved intermediate portion of the first path, and each straight lateral part of the suspension portion of the draw cable is located along a chord connected to the curved intermediate portion of the first path by a given angle of other than 180°.

[0007] This invariably results in wear of both the idler rollers and the draw cable, and may even result in jamming and/or unseating of the draw cable.

DISCLOSURE OF INVENTION

[0008] It is an object of the present invention to provide a cable transportation system of the above type, designed to eliminate the aforementioned drawbacks.

[0009] According to the present invention, there is provided a cable transportation system in accordance to claim 1.

[0010] To assist detachment of the upstream end part of the suspension portion from the rollers, and reconnection of the downstream end part of the suspension portion to the rollers as the trolley runs along the second curved intermediate portion, the rollers along the first curved intermediate portion are preferably inclined rollers mounted to rotate about respective axes, which are inclined so that a top peripheral portion, engaged by the draw cable, of each inclined roller faces outwards with respect to the second curved intermediate portion.

[0011] Finally, each inclined roller preferably has an outer surface defined by two opposite truncated-cone shaped surfaces defining a V-section annular groove.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic side view, with parts removed for clarity, of a preferred embodiment of the transportation system according to the present invention;
Figure 2 shows a larger-scale view in perspective of a detail in Figure 1;
Figure 3 shows a side view of the Figure 2 detail;
Figure 4 shows a larger-scale detail of Figure 3;
Figure 5 shows a plan view of the Figure 2 detail;
Figure 6 shows a larger-scale section along line VI-VI in Figure 5;
Figure 7 shows a larger-scale section along line VII-VII in Figure 4;
Figure 8 shows a larger-scale section along line VIII-VIII in Figure 3;
Figure 9 shows a larger-scale schematic, with parts removed for clarity, of a detail in Figure 8.

BEST MODE FOR CARRYING OUT THE INVENTION

[0013] Number 1 in Figure 1 indicates as a whole a cable transportation system comprising a bottom station 2; a top station 3; two intermediate idlers 4 supported by respective pylons 5; two supporting cables 6 (only one shown in Figure 1); a draw cable 7; and a transportation unit 8 comprising a trolley 9, which is supported by supporting cables 6, and is drawn, in use, by draw cable 7, to which trolley 9 is connected by a clamp 10.

[0014] More specifically, supporting cables 6 are parallel, and draw cable 7 extends below supporting cables 6 and is so positioned that, along substantially the whole of cable transportation system 1 and at any point in its operation, connecting the corresponding points of supporting cables 6 and draw cable 7 gives a substantially isosceles triangle with a horizontal base at the top and a downward-facing apex defined by a point on draw cable 7.

[0015] As shown more clearly in Figures 2 and 4, trolley 9 comprises a longitudinal frame 11 with two cross members 12, each of which extends crosswise to supporting cables 6 and supports at each end a wheel assembly 13

comprising a rocker arm 14, which is connected to relative cross member 12 to oscillate about an axis 15 crosswise to supporting cables 6, and supports, at each end, an idle roller 16, the periphery of which rolls in contact with relative supporting cable 6. An L-shaped arm 17 projects downwards from frame 11, and the end portion of the arm is located below and connected to draw cable 7 by clamp 10, which is selectively releasable in known manner to release trolley 9 from draw cable 7.

[0016] A further arm 18 projects laterally from longitudinal frame 11, bends downwards and outwards of supporting cables 6, and supports in rocking manner a load forming part of transportation unit 8 and defined, in the example shown, by a car 19.

[0017] As shown in Figure 1, each idler 4 comprises a roller assembly 20 in turn comprising a succession of rollers 21, which are fitted idly to an elongated carrier 22 integral with relative pylon 5, and support and guide draw cable 7 in space through idler 4 and along a trajectory T1. Idler 4 also comprises an elongated shoe 23 integral with relative pylon 5, and which supports and guides supporting cables 6 along respective trajectories T2.

[0018] As shown more clearly in Figure 2, shoe 23 comprises two parallel, elongated lateral shoulders 24, each of which is vertical and bounded at the top by a transverse core supporting a respective rail 25, which has a longitudinal groove 26 extending along relative trajectory T2 and engaged by relative supporting cable 6. The two lateral shoulders 24 are connected to relative pylon 5 in known manner not shown, and are connected to each other by a number of transverse ribs 27. Each pair of adjacent ribs 27 defines, together with lateral shoulders 24, a window 28 engaged by a relative roller 21 of roller assembly 20. Each rib 27 is bounded at the bottom by a flat, substantially horizontal edge, and is bounded at the top by an upwardly-concave curved edge 29 having a central recess 30, which divides edge 29 into two sloping sides converging downwards towards recess 30, and the end portions of which, adjacent to recess 30, are fitted with respective converging pads 31 inclined as specified in detail below. The succession of recesses 30 defines a channel 32 extending substantially along trajectory T1, and from the bottom of which rollers 21 project partly upwards through relative windows 28.

[0019] As shown in Figure 3, when projected in a vertical plane, trajectories T1 and T2 (Fig. 2) define respective parallel, downwardly-concave, curved paths.

[0020] As shown in Figure 5, when projected in a horizontal plane, trajectories T1 and T2 define respective paths P1 and P2. More specifically, path P1 comprises a curved intermediate portion 33 interposed between a straight entry end portion 34 and a straight exit end portion 35; whereas paths P2 are parallel, and each comprise a curved intermediate portion 36 interposed between a straight entry end portion 37 parallel to end portion 34, and a straight exit end portion 38 parallel to end portion 35. Straight entry end portions 37 are generally symmetrical with respect to straight entry end portion 34; straight exit end portions 38 are generally symmetrical with respect to straight exit end portion 35; whereas curved intermediate portion 33 has a smaller curvature than curved intermediate portions 36, and gets gradually closer to the inner curved intermediate portion 36, eventually reaching a minimum distance from it at the centre of the inner curved intermediate portion 36.

[0021] This difference in the shape of curved intermediate portions 33 and 36 is due to the fact that, as trolley 9 runs along curved intermediate portions 36 of paths P2, its clamp 10 moves along a path parallel to curved intermediate portions 36 and, at the same time, lifts draw cable 7 off rollers 21 along a suspension portion 39 movable with trolley 9, and of which an intermediate part extends along clamp 10, and two end parts 40 extend along respective chords of the path travelled by clamp 10, and form angles of other than 180° with the portions of draw cable 7 adjacent to them. If the horizontal projections of end parts 40 for each position of trolley 9 along curved intermediate portions 36 are represented in a horizontal plane, this gives a so-called "envelope curve", the shape and position of which coincide with those of curved intermediate portion 33.

[0022] By arranging rollers 21 along a path P1 of the shape described above, the two end parts 40 are respectively detached from and reconnected to rollers 21, forming angles of substantially 180° with the respective adjacent portions of draw cable 7.

[0023] As shown more clearly in Figures 5 and 6, rollers 21 comprise cylindrical rollers 21a, which are arranged successively along straight portions 34 and 35 of path P1, each have an annular, substantially semicircular-section groove 41 engaged by draw cable 7, and are fitted to carrier 22 (Figure 1) to rotate idly about respective horizontal axes 42.

[0024] As shown more clearly in Figures 4, 5, 7 and 8, rollers 21 also comprise rollers 21b arranged successively along curved intermediate portion 33 of path P1, and fitted to carrier 22 (Figure 1) to rotate about respective axes 43 (Figures 7, 8), which are inclined to the horizontal by an angle of 5 to 45 degrees, so that a top peripheral portion, engaged by draw cable 7, of each roller 21b faces the outer curved intermediate portion 36, and has an outer surface (Figures 7, 8) defined by two opposite truncated-cone-shaped surfaces 44, 45 defining an annular, V-section groove 46. More specifically, at the highest point of truncated-cone-shaped surfaces 44 and 45, the relative generating lines are substantially parallel to and coplanar with the respective adjacent pads 31, and cooperate with pads 31 to completely close channel 32 at relative window 28.

[0025] As such, rollers 21b not only provide for guiding detachment and reconnection of end parts 40 from and to roller assemblies 20 along curved intermediate portion 33 of path P1, but also make jamming and/or unseating of draw cable 7 along curved intermediate portion 33 of path P1 substantially impossible.

Claims

1. A cable transportation system comprising a draw cable (7); two supporting cables (6); a transportation unit (8) comprising a trolley (9) supported by the supporting cables (6) and selectively connectable to the draw cable (7) by a clamp (10); and at least one fixed idler (4) comprising a succession of rollers (21) distributed along a first trajectory (T1) to support and guide the draw cable (7), and a fixed shoe (23) for supporting and guiding the supporting cables (6) along second trajectories (T2) extending along the first trajectory (T1); the first trajectory (T1) and the second trajectories (T2), when projected in a horizontal plane, respectively defining a first path (P1) and second paths (P2) comprising a first curved portion (33), a second curved inner portion (36), and a second curved outer portion (36) respectively; wherein, along the idler (4) and when the trolley (9) is located, in use, along the idler (4), the draw cable (7) comprises a suspension portion (39) detached from the rollers (21), and of which a central part is located at the clamp (10), and two straight end parts (40) extend from the clamp (10) towards the rollers (21); the cable transportation system being **characterized in that** the first curved portion (33) is extending along an envelope curve of the horizontal projections of said straight end parts (40) in the successive positions occupied by the straight end parts (40) as the trolley (9) moves, in use, along the second inner and outer curved portions (36), wherein the first curved portion (33) has a smaller curvature than the second curved inner portion (36) and the second curved outer portion (36).

2. A cable transportation system as claimed in Claim 1, wherein the first curved portion (33) and second curved inner and outer portions (36) are intermediate portions of the first path (P1) and second paths (P2) respectively; and wherein the first path (P1) also comprises two straight first end portions (34, 35) on opposite sides of the first curved portion (33); and the second paths (P2) also comprises two straight second end portions (37, 38) on opposite sides of the second curved inner and outer portions (36); each straight first end portion (34; 35) being parallel to a respective straight second end portions (37; 38).

3. A cable transportation system as claimed in one of the foregoing Claims, wherein the rollers (21) along the first curved portion (33) are inclined rollers (21b) mounted to rotate about respective axes (43), which are inclined so that a top peripheral portion, engaged by the draw cable (7), of each inclined roller (21b) faces outwards with respect to the second curved outer portion (36).

4. A cable transportation system as claimed in Claim 3, wherein each said inclined roller (21b) has an outer surface defined by two opposite truncated-cone shaped surfaces (44, 45) defining an annular, V-section groove (46).

5. A cable transportation system as claimed in Claim 3 or 4, wherein the axis (43) of rotation of each inclined roller (21b) forms an angle of 5° to 45° with the horizontal.

6. A cable transportation system as claimed in any of the foregoing Claims, wherein the rollers (21) along each straight first end portion (34; 35) are cylindrical rollers (21a) mounted to rotate about respective horizontal axes (42).

7. A cable transportation system as claimed in one of the foregoing Claims, and wherein the shoe (23) comprises two parallel, elongated, longitudinal lateral shoulders (24), each of which supports supporting and guide means (25, 26), extending along a respective second trajectory (T2), for a respective supporting cable (6); and a number of transverse ribs (27) connecting the two shoulders (24) to each other;
each pair of adjacent ribs (27) defining, together with the shoulders (24), a window (28) engaged by a relative roller (21) for supporting and guiding the draw cable (7).

8. A cable transportation system as claimed in Claim 7, wherein each rib (27) is bounded at the top by an upwardly-concave curved edge (29) having a central recess (30), which divides the curved edge (29) into two sloping sides converging downwards towards the recess (30); the recesses (30) being aligned to define a channel (32) extending along the first trajectory (T1).

9. A cable transportation system as claimed in Claim 8, wherein the end portions, adjacent to the relative recess (30), of said sloping sides of each rib (27) are fitted with respective inclined, converging pads (31).

Patentansprüche

1. Seiltransportsystem, umfassend ein Zugseil (7); zwei Halteseile (6); eine Transporteinheit (8), die einen Wagen (9) umfasst, der von den Halteseilen (6) gehalten wird und selektiv durch eine Klemme (10) mit dem Zugseil (7) verbindbar ist; und wenigstens eine feste Rollenbatterie (4), die eine Folge von Rollen (21) umfasst, die entlang einer ersten Bewegungsbahn (T1) verteilt sind, um das Zugseil (7) zu halten und zu führen, und einen festen Aufspannkörper (23) zum Halten und Führen der Halteseile (6) entlang von zweiten Bewegungsbahnen (T2), die

sich entlang der ersten Bewegungsbahn (T1) erstrecken; wobei die erste Bewegungsbahn (T1) und die zweiten Bewegungsbahnen (T2), wenn sie in eine Horizontalebene projiziert werden, jeweils einen ersten Pfad (P1) und zweite Pfade (P2) definieren, die jeweils einen ersten gekrümmten Abschnitt (33), einen zweiten gekrümmten inneren Abschnitt (36) und einen zweiten gekrümmten äußeren Abschnitt (36) umfassen; wobei entlang der Rollenbatterie (4), wenn der Wagen (9) im Gebrauch entlang der Rollenbatterie (4) angeordnet ist, das Zugseil (7) einen Aufhängungsabschnitt (39) umfasst, der von den Rollen (21) gelöst ist, und von dem ein zentraler Teil sich an der Klemme (10) befindet und zwei gerade Endteile (40) sich von der Klemme (10) in Richtung der Rollen (21) erstrecken; wobei das Seiltransportsystem **dadurch gekennzeichnet ist, dass** sich der erste gekrümmte Abschnitt (33) entlang einer Einhüllendenkurve der horizontalen Projektionen der geraden Endteile (40) in den aufeinanderfolgenden Positionen erstreckt, die von den geraden Endteilen (40) besetzt sind, wenn sich der Wagen (9) im Gebrauch entlang des zweiten inneren und des zweiten äußeren gekrümmten Abschnitts (36) bewegt, wobei der erste gekrümmte Abschnitt (33) eine geringere Krümmung als der zweite gekrümmte innere Abschnitt (36) und der zweite gekrümmte äußere Abschnitt (36) aufweist.

2. Seiltransportsystem nach Anspruch 1, wobei der erste gekrümmte Abschnitt (33) und der zweite gekrümmte innere und der zweite gekrümmte äußere Abschnitt (36) jeweils Zwischenabschnitte der des ersten Pfads (P1) und des zweiten Pfads (P2) sind; und wobei der erste Pfad (P1) auch zwei gerade erste Endabschnitte (34, 35) auf entgegengesetzten Seiten des ersten gekrümmten Abschnitts (33) umfasst; und die zweiten Pfade (P2) auch zwei gerade zweite Endabschnitte (37, 38) auf entgegengesetzten Seiten des zweiten gekrümmten inneren und des zweiten gekrümmten äußeren Abschnitts (36) umfasst; wobei jeder gerade erste Endabschnitt (34; 35) parallel zu einem jeweiligen geraden zweiten Endabschnitt (37; 38) ist.

3. Seiltransportsystem nach einem der vorangehenden Ansprüche, wobei die Rollen (21) entlang des ersten gekrümmten Abschnitts (33) Schrägrollen (21b) sind, die derart montiert sind, dass sie sich um jeweilige Achsen (43) drehen, die derart geneigt sind, dass ein oberer Umfangsabschnitt, in den von dem Zugseil (7) eingegriffen wird, jeder Schrägrolle (21b) in Bezug auf den zweiten gekrümmten äußeren Abschnitt (36) nach außen gewandt ist.

4. Seiltransportsystem nach Anspruch 3, wobei jede Schrägrolle (21b) eine Außenoberfläche hat, die durch zwei entgegengesetzte kegelstumpfförmige Oberflächen (44, 45) definiert wird, die eine ringförmige Nut (46) mit V-Schnitt definieren.

5. Seiltransportsystem nach Anspruch 3 oder 4, wobei die Drehachse (43) jeder Schrägrolle (21b) einen Winkel von 5° bis 45° mit der Horizontalen bildet.

6. Seiltransportsystem nach einem der vorangehenden Ansprüche, wobei die Rollen (21) entlang jedem geraden ersten Endabschnitt (34; 35) Zylinderrollen (21a) sind, die derart montiert sind, dass sie sich um jeweilige Horizontalachsen (42) drehen.

7. Seiltransportsystem nach einem der vorangehenden Ansprüche, und wobei der Aufspannkörper (23) zwei parallele längliche seitliche Längsabsätze (24) umfasst, von denen jeder Halte- und Führungsmittel (25, 26) trägt, die sich für ein jeweiliges Halteseil (6) entlang einer jeweiligen zweiten Bewegungsbahn (T2) erstrecken; und eine Anzahl von Querrippen (27), welche die zwei Absätze (24) miteinander verbinden; wobei jedes Paar benachbarter Rippen (27) zusammen mit den Absätzen (24) ein Fenster (28) definiert, in das von einer jeweilige Rolle (21) zum Halten und Führen des Zugseils (7) eingegriffen wird.

8. Seiltransportsystem nach Anspruch 7, wobei jede Rippe (27) an der Oberseite durch einen aufwärtsgekrümmten Rand (29) mit einer mittleren Aussparung (30) eingefasst ist, welche den gekrümmten Rand (29) in zwei geneigte Seiten trennt die nach unten in Richtung der Aussparung (30) konvergieren; wobei die Aussparungen (30) ausgerichtet sind, um einen Kanal (32) zu definieren, der sich entlang der ersten Bewegungsbahn (T1) erstreckt.

9. Seiltransportsystem nach Anspruch 8, wobei die Endabschnitte, die zu der jeweiligen Aussparung (30) benachbart sind, der geneigten Seiten jeder Rippe (27) mit jeweiligen geneigten konvergierenden Auflagern (31) versehen sind.

Revendications

1. Système de transport par câble comprenant un câble de traction (7) ; deux câbles de support (6) ; une unité de transport (8) comprenant une nacelle (9) supportée par les câbles de support (6) et pouvant être raccordée sélectivement au câble de traction (7) par une pince (10) ; et au moins un jeu de galets fixe (4) comprenant une succession de galets (21) répartis le long d'une première trajectoire (T1) pour supporter et guider les câbles de traction (7), et un sabot fixe (23) destiné à supporter et guider les câbles de support (6) le long d'une seconde trajectoire (T2) s'étendant le long de la première trajectoire (T1) ; la pre-

mière trajectoire (T1) et la seconde trajectoire (T2) définissant respectivement, en projection dans un plan horizontal, un premier chemin (P1) et un second chemin (P2) comprenant respectivement une première portion incurvée (33) et seconde portion incurvée (36) ; dans lequel, le long du jeu de galets (4) et lorsque la nacelle (9) est placée, en utilisation, le long du jeu de galets (4), le câble de traction (7) comprend une portion de suspension (39) qui est détachée des galets (21) et dont une partie centrale est située au niveau de la pince (10), et deux parties d'extrémité rectilignes (40) s'étendent depuis la pince (10) en direction des galets (21) ; le système de transport par câble étant **caractérisé en ce que** la première portion incurvée (33) s'étend le long d'une courbe d'enveloppe des projections horizontales desdites parties d'extrémité rectilignes (40) dans les positions successives occupées par les parties d'extrémité rectilignes (40) lorsque la nacelle (9) se déplace, en utilisation, le long des secondes portions incurvées internes et externes (36), dans lequel la première portion incurvée (33) possède une courbure inférieure à la deuxième portion incurvée interne (36) et à la deuxième portion incurvée externe (36).

2. Système de transport par câble selon la revendication 1, dans lequel la première portion incurvée (33) et les secondes portions incurvées internes et externes (36) sont des portions intermédiaires des premier et second chemins (P1, P2) respectivement ; et dans lequel le premier chemin (P1) comprend également deux premières portion d'extrémité rectilignes (34, 35) sur des côtés opposés de la première portion incurvée (33) ; et le second chemin (P2) comprend également deux secondes portions d'extrémité rectilignes (37, 38) sur des côtés opposés des secondes portions incurvées internes et externes (36) ; chaque première portion d'extrémité rectiligne (34 ; 35) étant parallèle à une seconde portion d'extrémité rectiligne respective (37 ; 38).

3. Système de transport par câble selon l'une des revendications précédentes, dans lequel les galets (21) le long de la première portion incurvée (33) sont des galets inclinés (21b) montés de façon à tourner autour d'axes respectifs (43), lesquels sont inclinés de telle sorte qu'une portion périphérique supérieure, avec laquelle le câble de traction (7) est engagée, de chaque galet incliné (21b) est dirigée vers l'extérieur par rapport à la seconde portion incurvée (36).

4. Système de transport par câble selon la revendication 3, dans lequel chaque galet incliné (21b) présente une surface extérieure définie par deux surfaces tronconiques opposées (44, 45) définissant une gorge en V annulaire (46).

5. Système de transport par câble selon la revendication 3 ou 4, dans lequel l'axe (43) de rotation de chaque galet incliné (21b) forme un angle de 5° à 45° par rapport à l'horizontale.

6. Système de transport par câble selon l'une quelconque des revendications précédentes, dans lequel les galets (21) le long de chaque première portion d'extrémité rectiligne (34 ; 35) sont des galets cylindriques (21a) montés de façon à tourner autour d'axes horizontaux respectifs (42).

7. Système de transport par câble selon l'une des revendications précédentes, et dans lequel le sabot (23) comprend deux épaulements (24) latéraux, longitudinaux, allongés et parallèles qui supportent chacun des moyens de support et de guidage (25, 26) s'étendant le long d'une seconde trajectoire respective (T2) destinés à un câble de support respectif (6) ; et un certain nombre de nervures transversales (27) raccordant les deux épaulements (24) l'un à l'autre ; chaque paire de nervures adjacentes (27) définissant, conjointement avec les épaulements (24), une fenêtre (28) avec laquelle s'engage un galet correspondant (21) destiné à supporter et guider le câble de traction (7).

8. Système de transport par câble selon la revendication 7, dans lequel chaque nervure (27) est limitée en haut par un bord (29) incurvé concave vers le haut comportant un évidement central (30) qui divise le bord incurvé (29) en deux côtés obliques convergents vers le bas en direction de l'évidement (30) ; les évidements (30) étant alignés de façon à définir un canal (32) s'étendant le long de la première trajectoire (T1).

9. Système de transport par câble selon la revendication 8, dans lequel les portions d'extrémité, adjacentes à l'évidement correspondant (30), desdits côtés obliques de chaque nervure (27) sont dotées de patins convergents inclinés respectifs (31) .

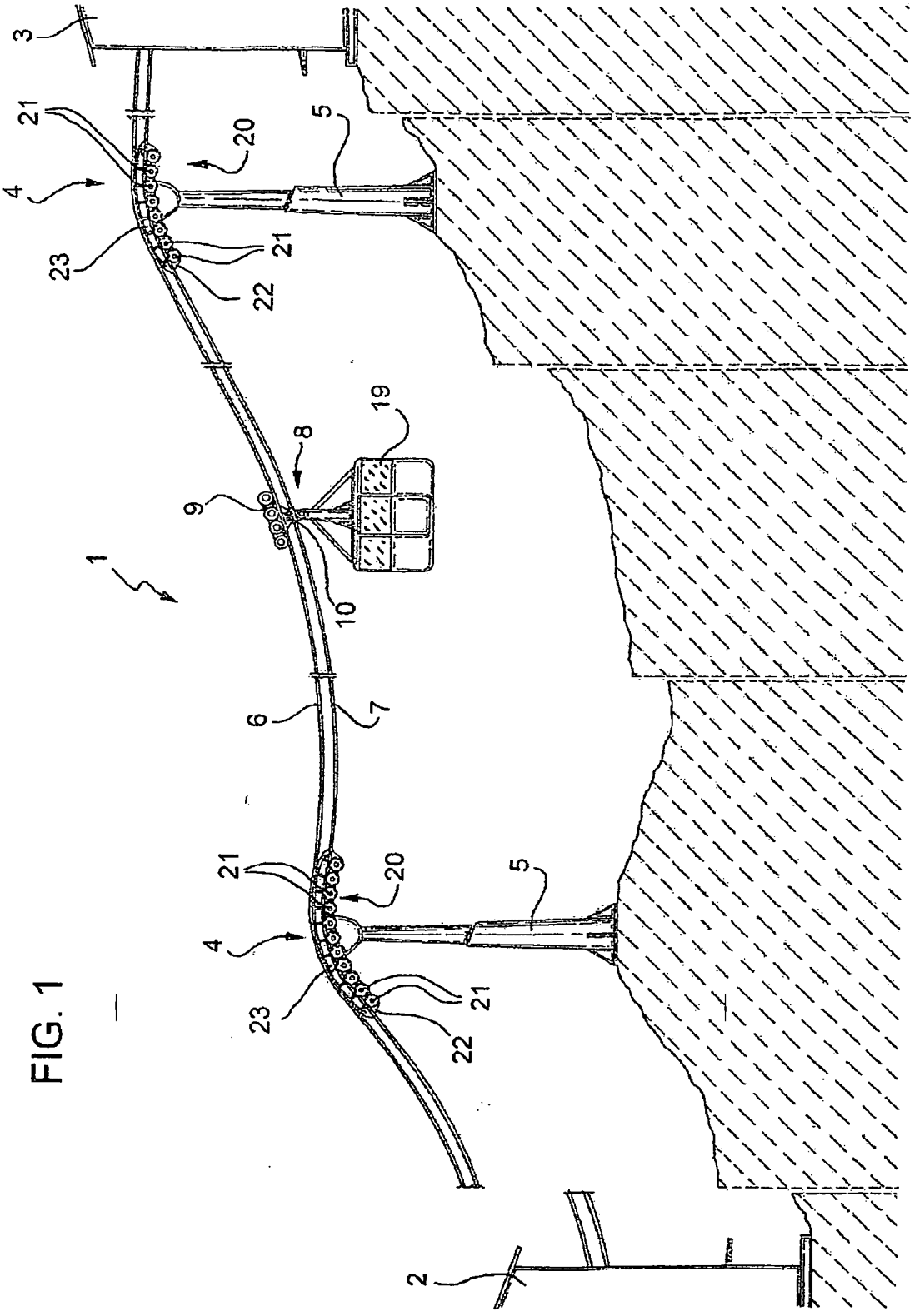
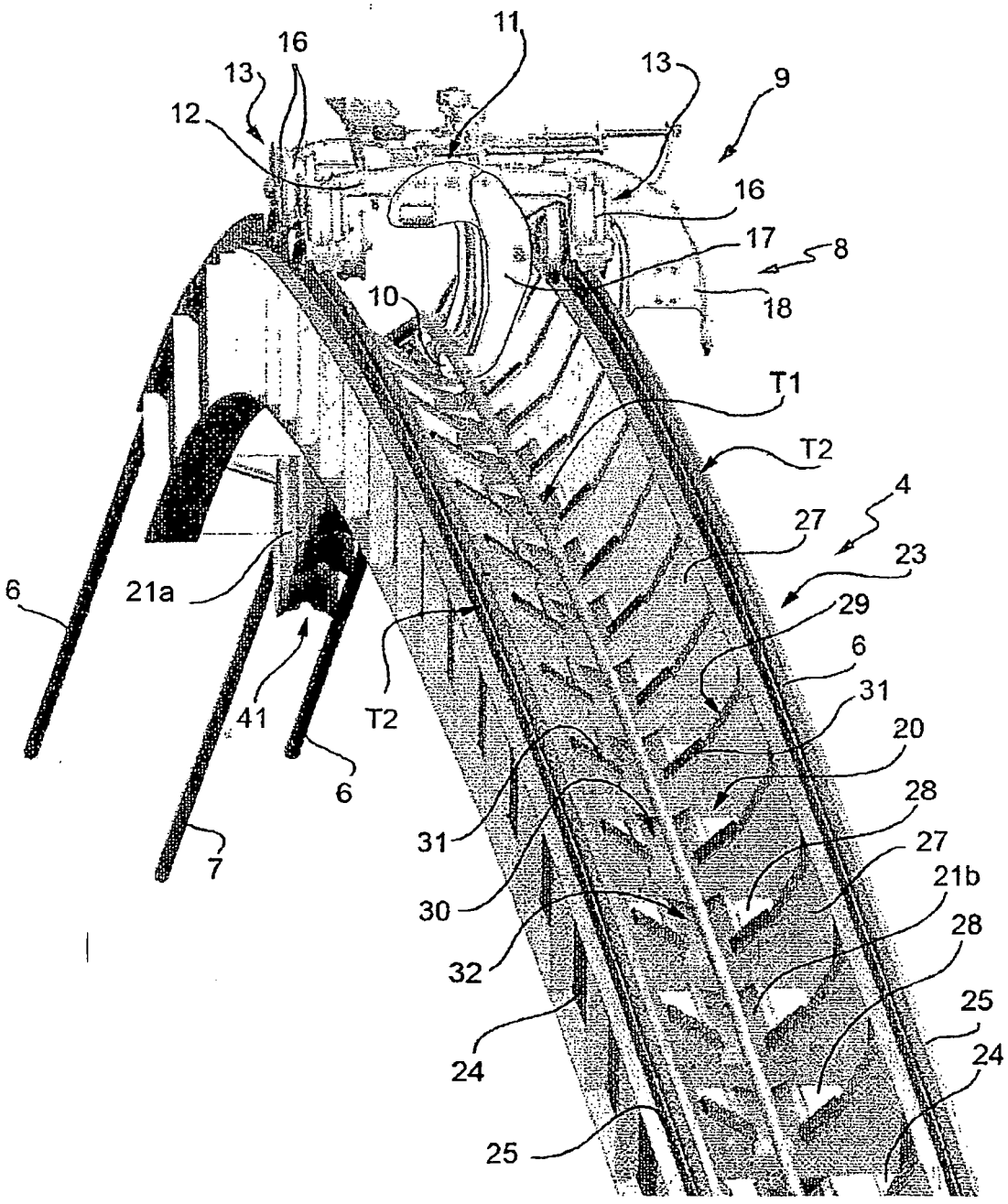


FIG. 1

FIG. 2


11
16
13
13
9
12
16
17
8
10
18
T1
T2
4
27
23
6
21a
29
6
31
41
T2
20
6
28
31
27
21b
30
28
32
25
24
24
25
7

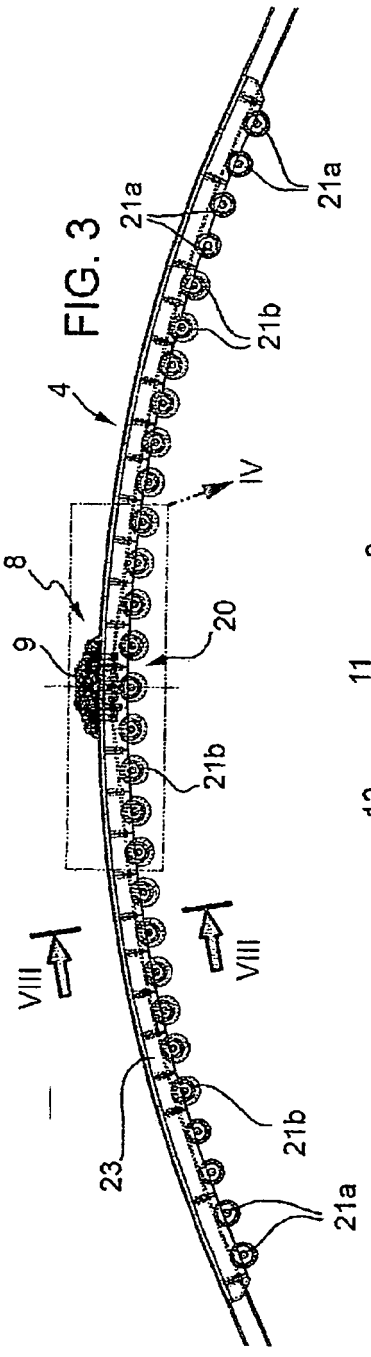


FIG. 3
4
8
9
20
21a
21b
23
IV
VIII
VIII

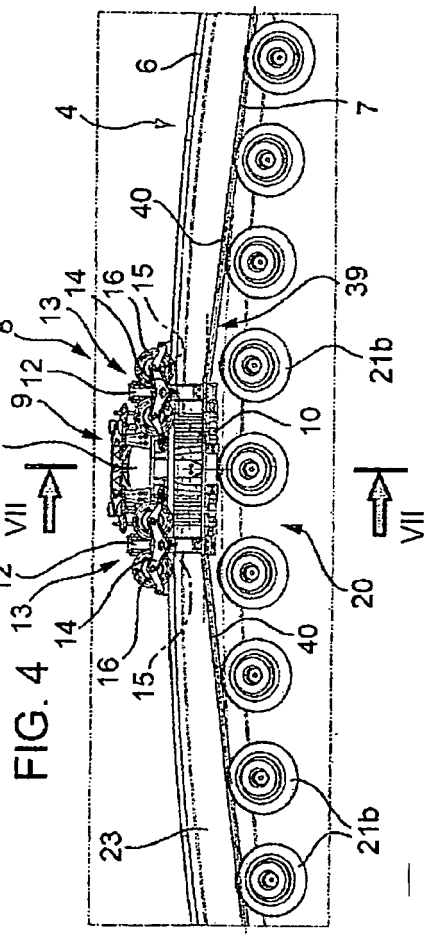


FIG. 4
4
6
7
8
9
10
11
12
13
14
15
16
20
21b
23
39
40
VII
VII

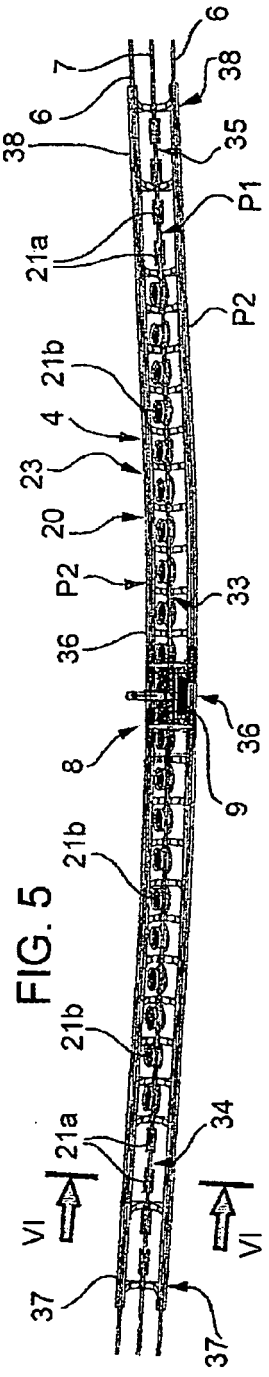


FIG. 5
6
7
8
9
20
21a
21b
23
33
34
35
36
37
38
P1
P2
VI
VI

FIG. 6

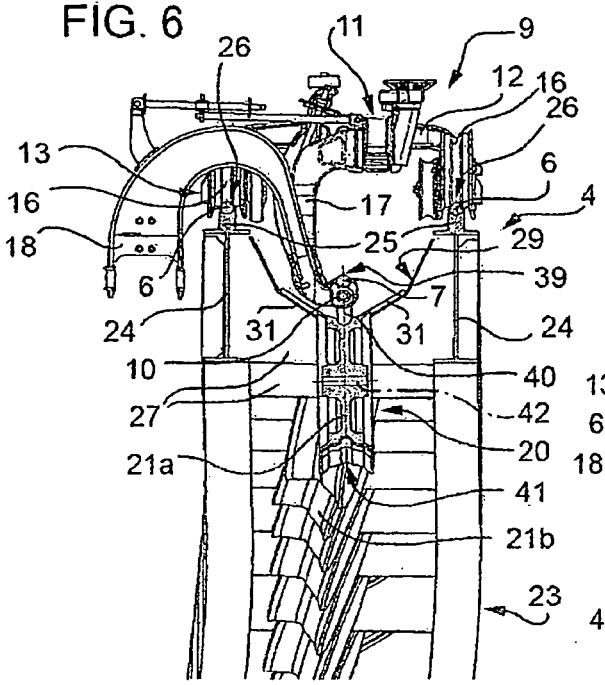


FIG. 7

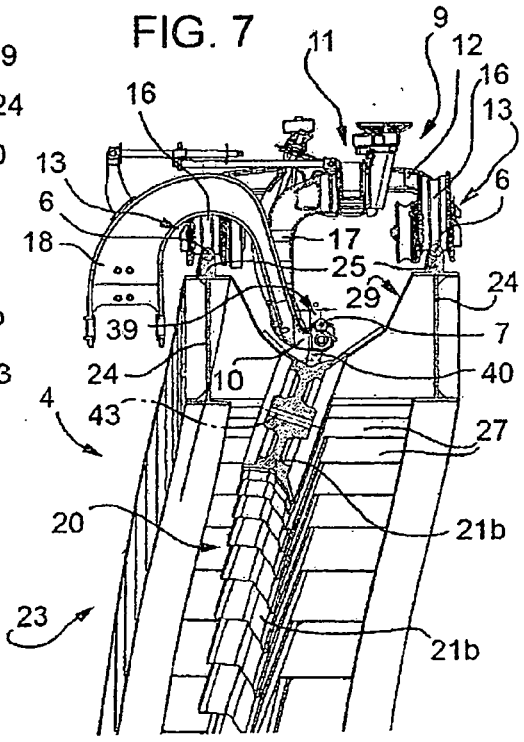


FIG. 8

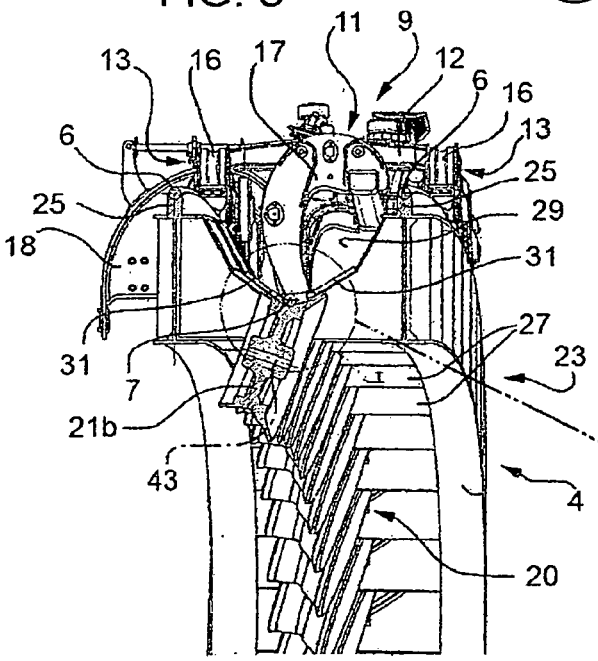
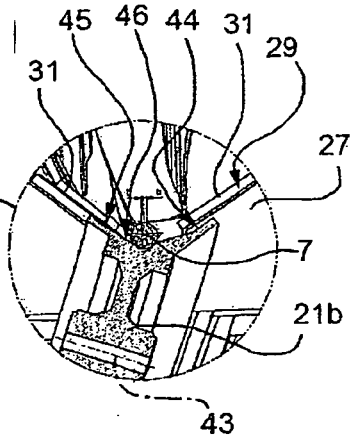


FIG. 9



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- GB 27151 A **[0003]**