



US 20020007757A1

(19) **United States**

(12) **Patent Application Publication**
Meindl

(10) **Pub. No.: US 2002/0007757 A1**

(43) **Pub. Date: Jan. 24, 2002**

(54) **RUNNING ROLLER FOR THE
TRAVELING-GEAR MECHANISM OF THE
TRANSPORT ASSEMBLY OF A CABLEWAY
SYSTEM**

(30) **Foreign Application Priority Data**

Jul. 18, 2000 (AT) A 1248/2000

Publication Classification

(76) **Inventor: Bernd Meindl, Hard (AT)**

(51) **Int. Cl.⁷ B61B 3/00**

(52) **U.S. Cl. 104/89; 104/118**

Correspondence Address:

LERNER AND GREENBERG, P.A.

POST OFFICE BOX 2480

HOLLYWOOD, FL 33022-2480 (US)

(21) **Appl. No.: 09/843,514**

(57) **ABSTRACT**

(22) **Filed: Apr. 26, 2001**

A running roller for the traveling-gear mechanism of the transport assembly of a cableway system has a pulley-type roller body. The roller body is produced from a metal, in particular from steel, and it is provided along the periphery of the roller body with a running surface which encloses the roller body and which is produced from a plastic material.

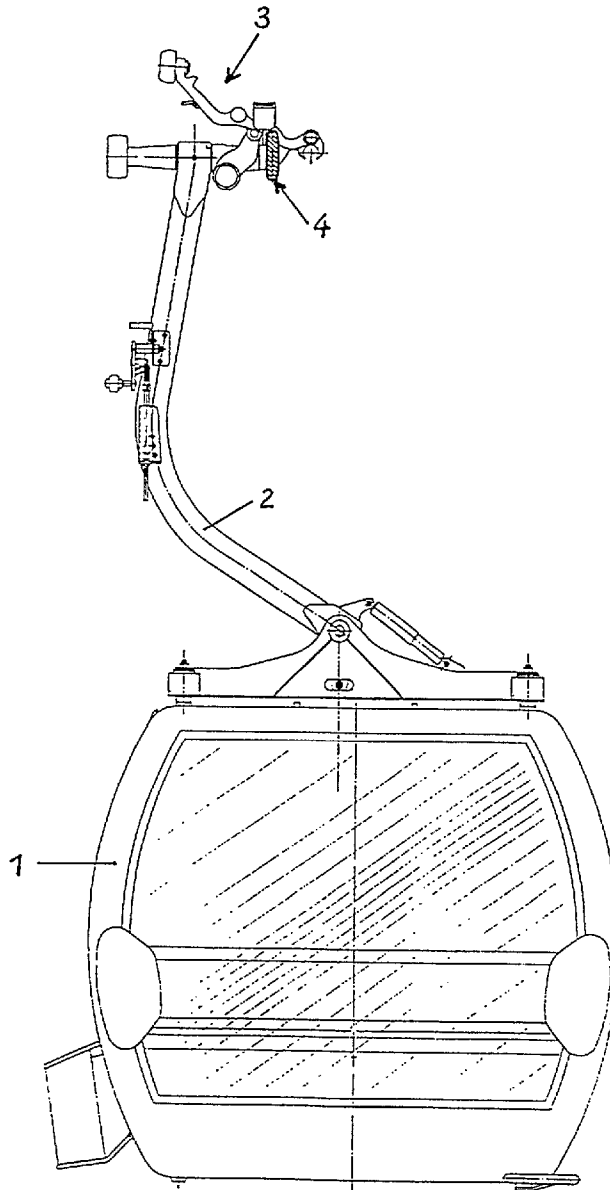


FIG.1

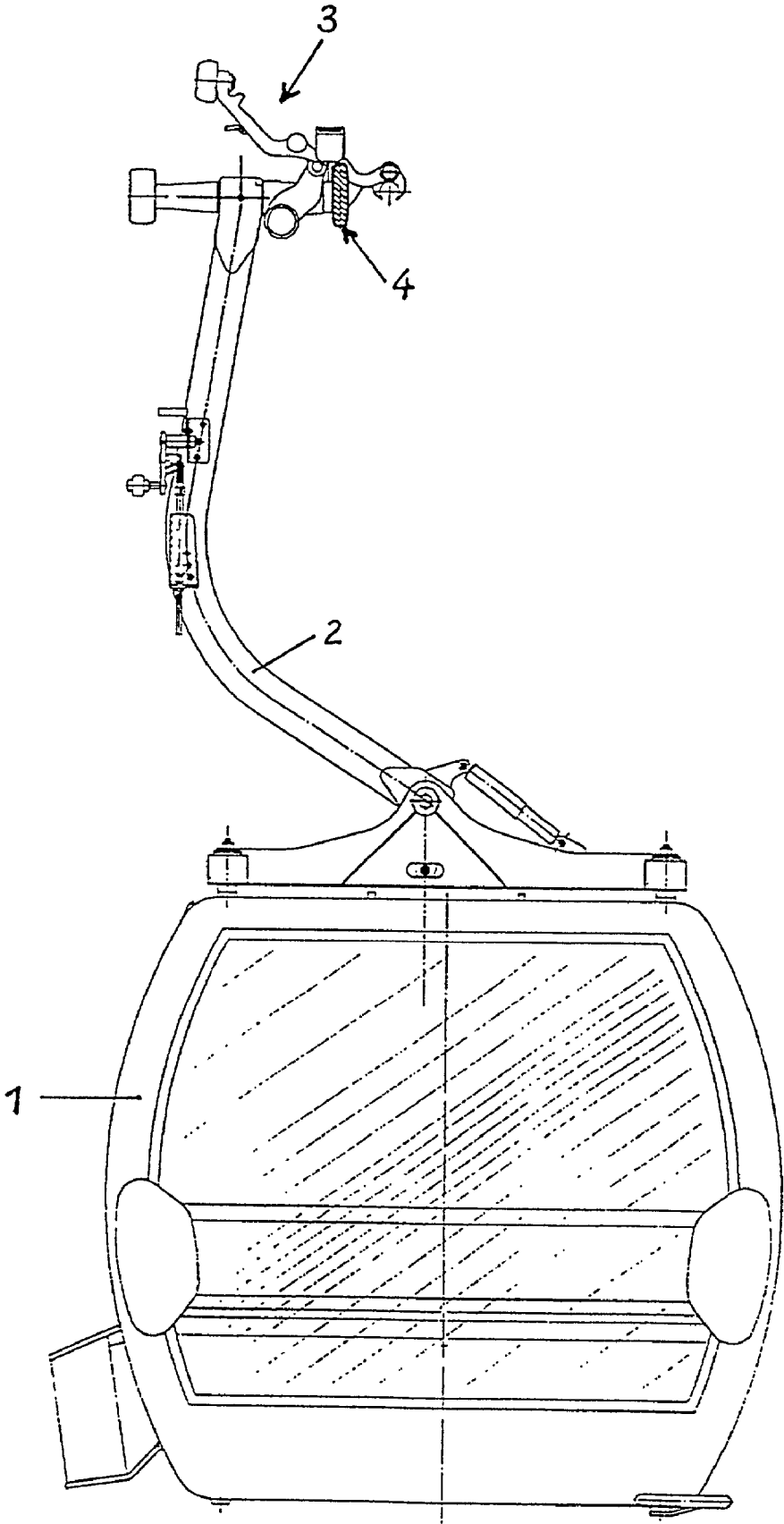


FIG.2

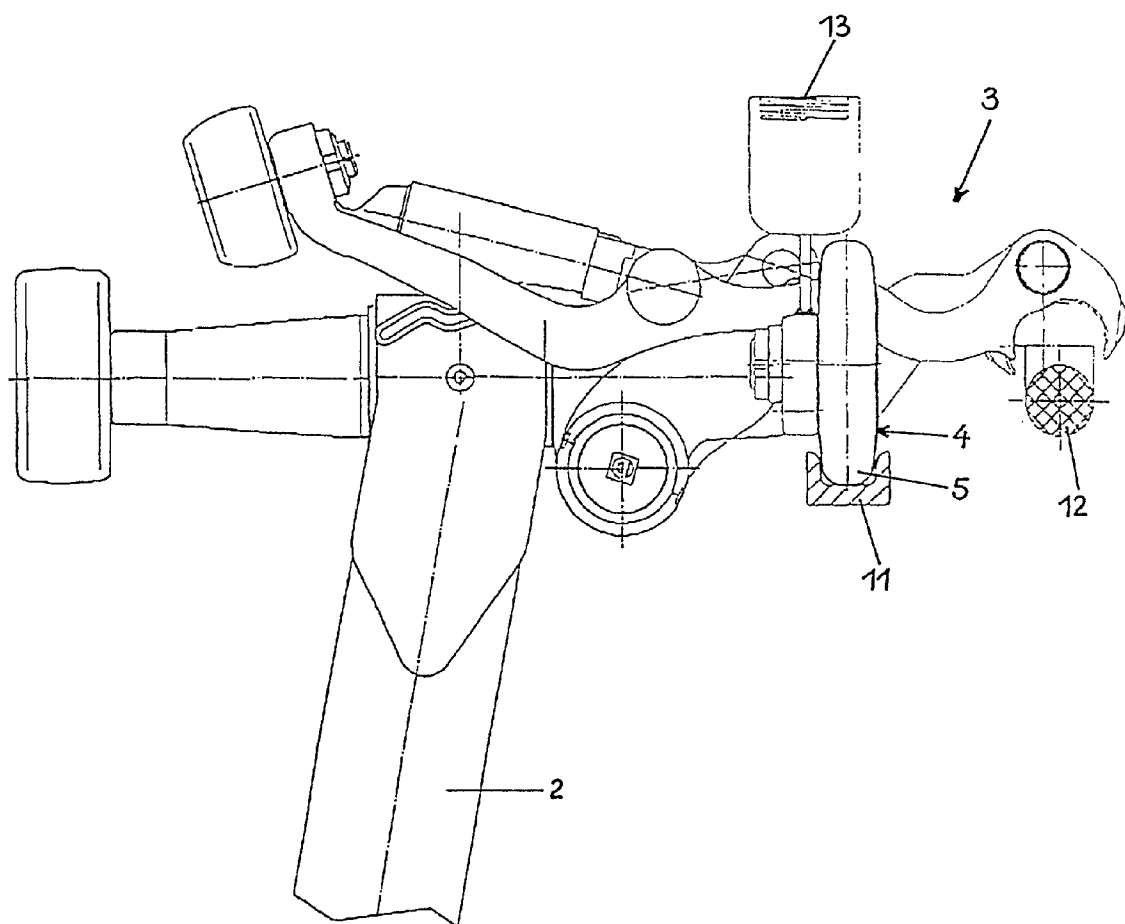


FIG.3

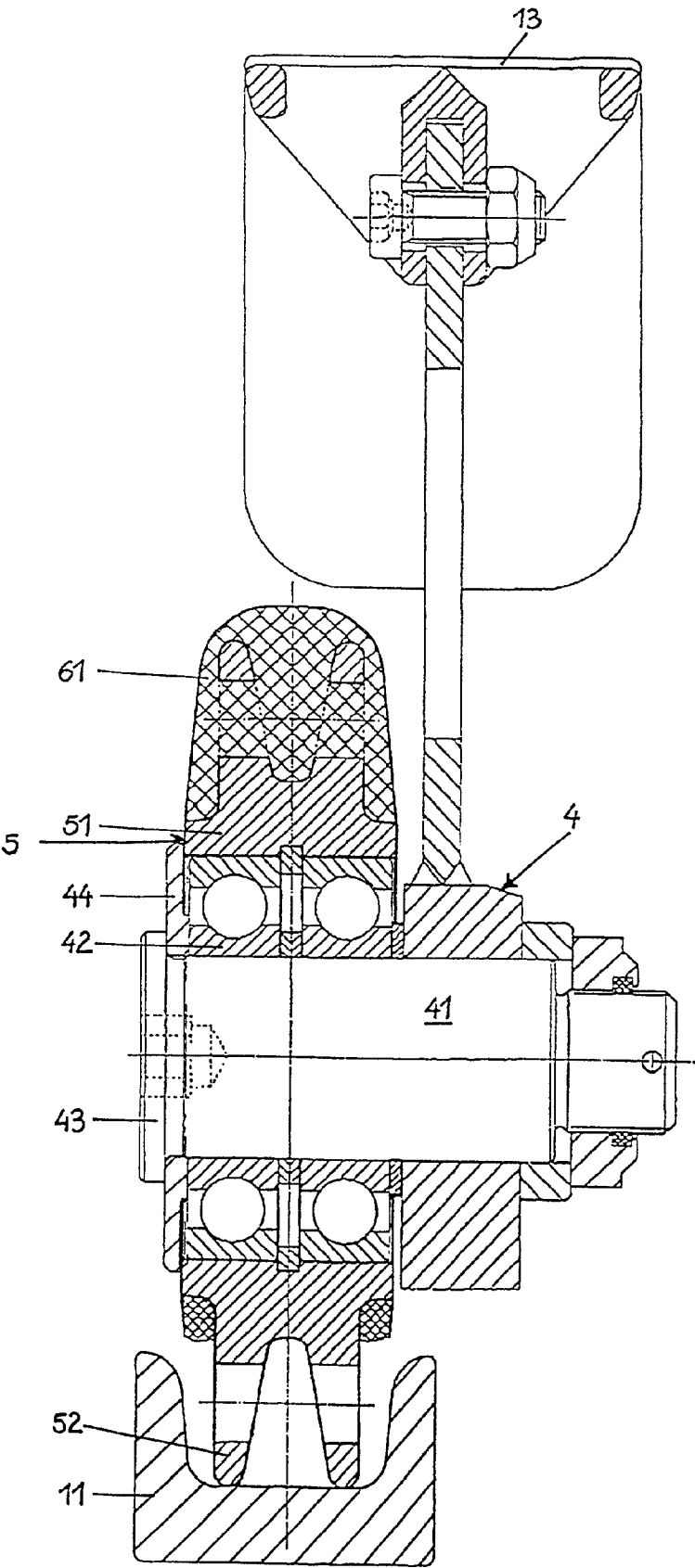


FIG.4

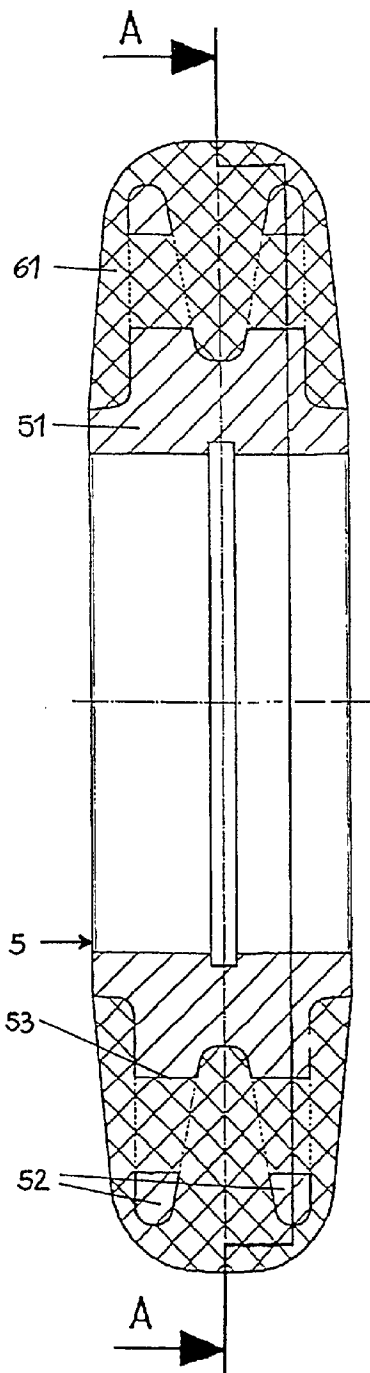


FIG.4a

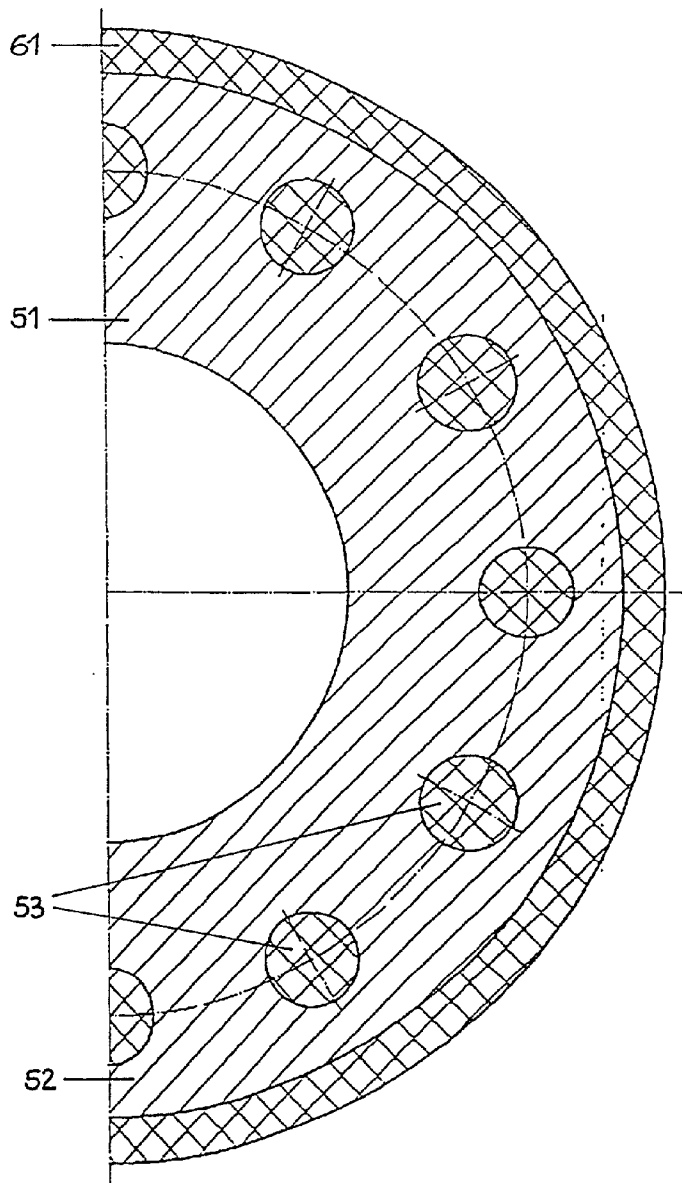


FIG.5

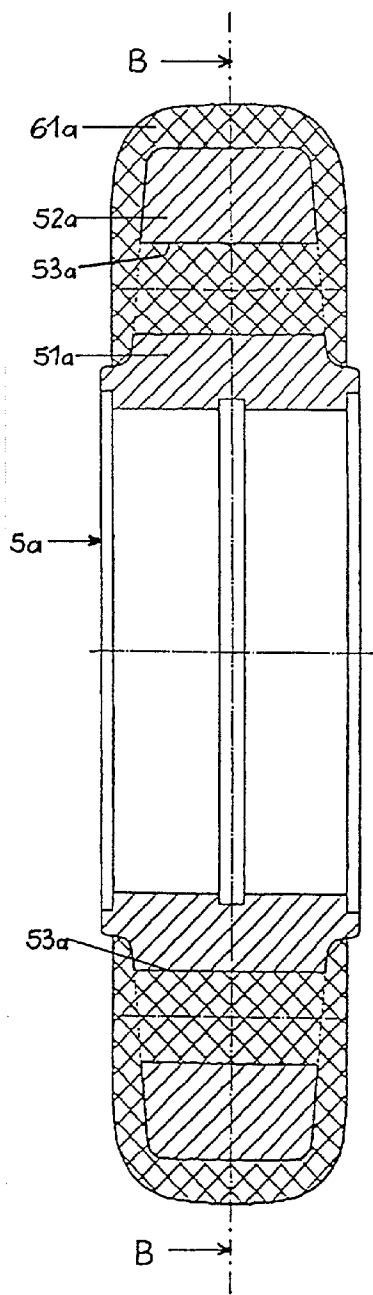


FIG.5a

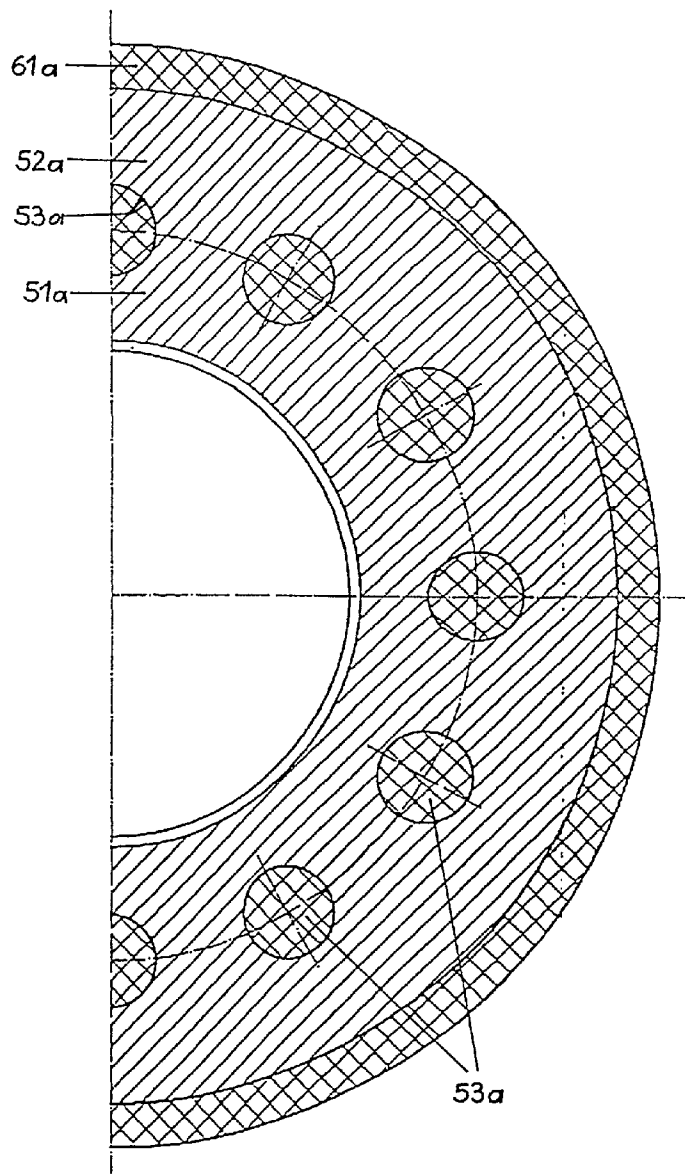


FIG.6

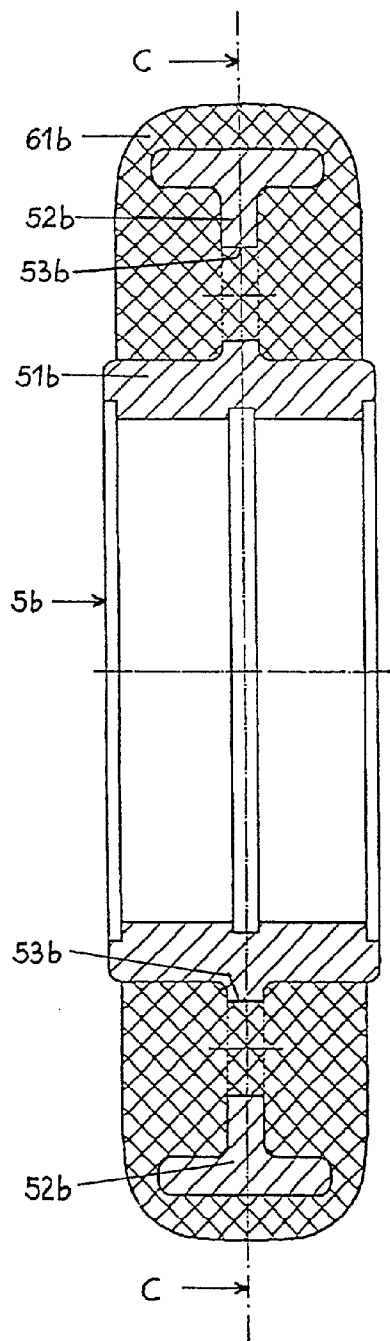


FIG.6a

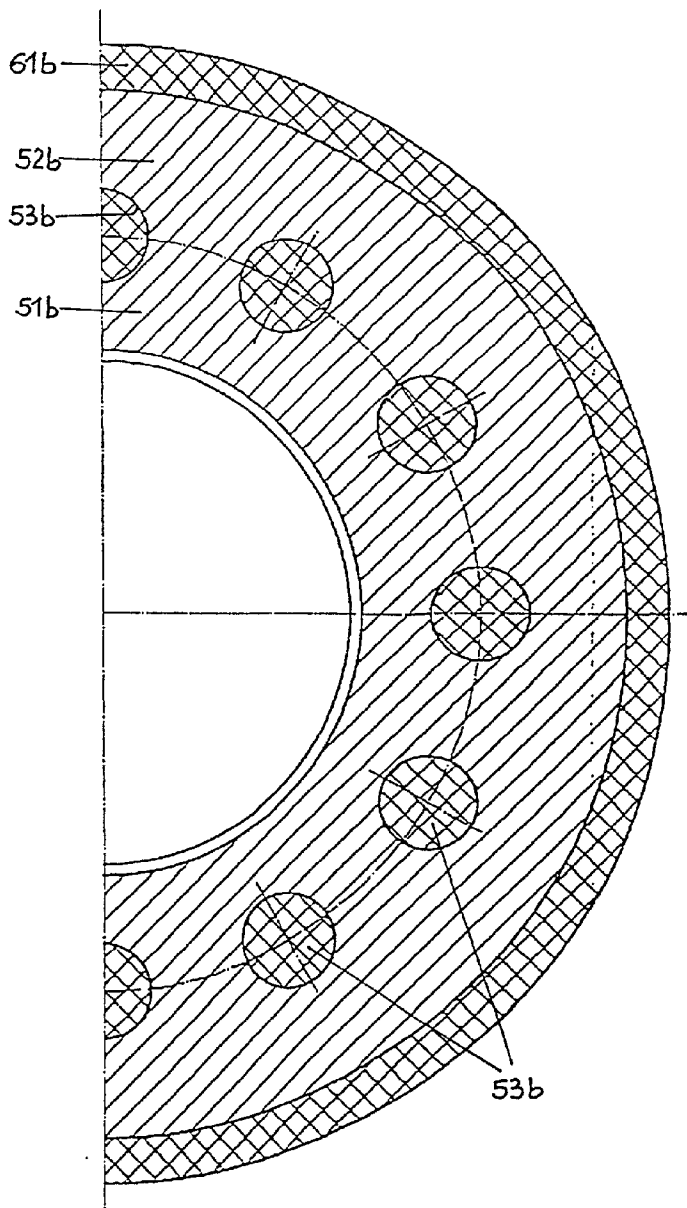


FIG.7

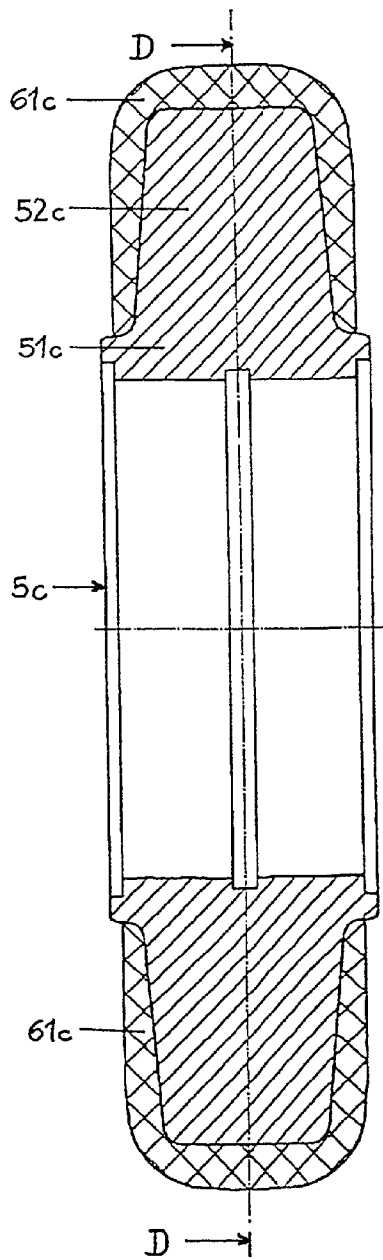


FIG.7a

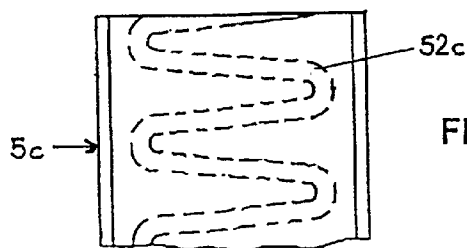
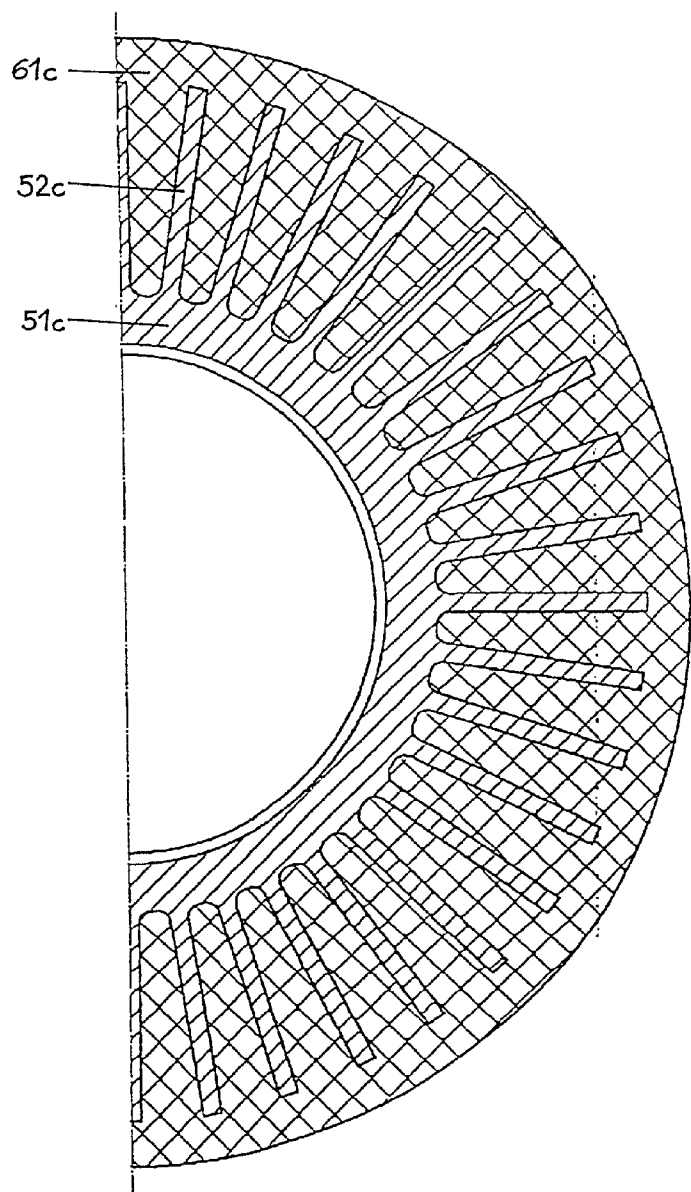


FIG.7b

RUNNING ROLLER FOR THE TRAVELING-GEAR MECHANISM OF THE TRANSPORT ASSEMBLY OF A CABLEWAY SYSTEM

BACKGROUND OF THE INVENTION

[0001] Field of the Invention

[0002] The present invention lies in the mechanical arts and relates, in general, to cableway or ropeway systems. More specifically, the invention pertains to a running roller for the traveling-gear mechanism of the transport assembly of a cableway system, having a disk-type roller body.

[0003] It is known in the case of cableway systems for the transport assembly to be designed, on the one hand, with clamps, by means of which they can be clamped onto the haulage cable, and, on the other hand, with traveling-gear mechanisms, by means of which they can be moved along guide rails in the stations once the clamps have been opened, i.e., when the cableway unit is detached from the haulage cable. In the case of those prior art cableway systems, the haulage cable is kept running at a speed of approximately 8 m/sec. In the stations, the transport assembly are uncoupled from the haulage cable and moved through the station region along guide rails at such a speed that passengers can disembark and embark the transport assembly.

[0004] It is known here for the running rollers to be produced from a metallic material. Such known running rollers, however, are disadvantageous because their movement along the guide rails, which are likewise produced from metal, causes very pronounced noise development. In order to keep the running noise to the lowest possible level, it is also known to produce the rollers of the running-gear mechanism from a plastic material. However, such running rollers have the disadvantage that they are at considerably greater risk of rupturing than is the case for running rollers produced from metal.

[0005] If a running roller ruptures, this can cause serious disruption to operation of the system. In particular, in the region where the transport assembly is coupled to the haulage cable, there is the risk of the haulage cable not being gripped by the clamps, as a result of which the transport assembly may crash downward as it leaves the station. In order to eliminate this risk, it has become known to provide additional guide rails, which are intended to ensure that the haulage cable is gripped by the clamps even if a running roller ruptures. These additional guide rails, however, do not meet the current requirements because they result in a further high level of design-related outlay and also because they do not ensure proper functioning of the clamps.

SUMMARY OF THE INVENTION

[0006] It is accordingly an object of the invention to provide a running roller for the running-gear mechanism of a transport assembly, which overcomes the above-mentioned disadvantages of the heretofore-known devices and methods of this general type.

[0007] With the foregoing and other objects in view there is provided, in accordance with the invention, a running roller for the traveling-gear mechanism of a transport assembly of a cableway system, comprising:

[0008] a pulley-type roller body formed of metal;

[0009] a running surface formed of plastic material enclosing the roller body about a circumferential periphery of the roller body.

[0010] In other words, the objects of the invention are satisfied in that the roller body which is produced from metal, in particular from steel, is provided along the circumference of the roller body with a running surface that encloses the roller body and is produced from a plastic material.

[0011] Since the roller body is produced from a metal, the risk of the running roller rupturing is reduced to a permissible extent. Since, in addition, the roller body is provided with a running surface produced from plastic material, the running noise of the running roller is reduced to the sought-after extent. Since, in addition, it is only the running surface which is produced from a plastic material, the roller body, which is produced from metal, assumes the function of the running roller in the case of the running surface rupturing, this achieving the emergency running properties which are necessary during the coupling operation of the clamps. Such a running roller thus completely avoids the disadvantages of the known prior art.

[0012] In accordance with an added feature of the invention, the roller body is formed, on its outer periphery, with at least one annular protrusion of which the outer diameter is at least 80%, in particular 90% to 95%, of the outer diameter of the running roller, and, in addition, the outer side surfaces of the at least one ring-like protrusion are spaced apart from one another by a distance which is at least 65%, in particular 75%, of the distance between the lateral guide surfaces of the running roller. This design thus achieves optimized emergency running properties since, as a result, the clamps are guided in relation to the haulage cable, both as far as their vertical position and as far as their lateral position are concerned, such that a proper coupling operation is ensured.

[0013] The roller body is preferably also designed, along the circumference, with through-passages, in particular with bores, which have the plastic material which forms the running surface passing through them. This achieves optimum fastening of the running surfaces, which are produced from a plastic material, on the metallic roller body. According to a preferred embodiment, the roller body, in the region of its hub, extends over the entire thickness of the running roller, whereas, radially outside its hub, it has a thickness which takes up approximately 70% of the thickness of the running roller.

[0014] It is critical for the functioning of the emergency running properties of the roller body that the latter largely corresponds to the running roller both in diameter and in width, in order thus to ensure the necessary vertical position and lateral position of the clamp for the coupling operation. This requirement can be met in that the roller body is designed with a single ring-like protrusion of which the outer diameter is approximately 90% of the outer diameter of the running roller and of which the width is approximately 85% of the distance between the lateral guide surfaces of the running roller.

[0015] Alternatively, it is possible for the roller body to be designed, on its circumference, with two ring-like protrusions.

sions of which the outer diameter is approximately 90% of the outer diameter of the running roller, and of which the outer wall surfaces are spaced apart from one another by a distance of approximately 85% of the distance between the lateral guide surfaces of the running roller.

[0016] In addition, the roller body may be designed with a cross-sectionally approximately T-shaped protrusion, the crossbar thereof being located in the region of the outer circumference. It is also possible for the roller body to be designed with a protrusion which runs in wave form over the circumference of the running roller.

[0017] Other features which are considered as characteristic for the invention are set forth in the appended claims.

[0018] Although the invention is illustrated and described herein as embodied in a running roller for the traveling-gear mechanism of the transport assembly of a cableway system, it is nevertheless not intended to be limited to the details shown, since various modifications and structural changes may be made therein without departing from the spirit of the invention and within the scope and range of equivalents of the claims.

[0019] The construction and method of operation of the invention, however, together with additional objects and advantages thereof will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1 shows a cableway cabin with a running-gear mechanism, a clamping device and a suspension bar, viewed in a direction parallel to the haulage cable;

[0021] FIG. 2 is a partial view of the running-gear mechanism and the clamping device on a larger scale than FIG. 1;

[0022] FIG. 3 is an axial section taken through a running roller mounted on the running-gear mechanism;

[0023] FIG. 4 is an axial section taken along a diameter through the running roller of FIG. 3;

[0024] FIG. 4a is a section taken along the line A-A in FIG. 4;

[0025] FIG. 5 is an axial section taken along a diameter through a further embodiment of the running roller according to the invention;

[0026] FIG. 5a is a section taken along the line B-B in FIG. 5;

[0027] FIG. 6 is an axial section taken along a diameter through a further embodiment of the running roller according to the invention;

[0028] FIG. 6a is a section taken along the line C-C in FIG. 6;

[0029] FIG. 7 is an axial section taken along a diameter through a further embodiment of the running roller according to the invention;

[0030] FIG. 7a is a section taken along the line C-C in FIG. 7; and

[0031] FIG. 7b is a diagrammatic plan view onto the periphery of the running roller and viewed in a radial direction.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0032] Referring now to the figures of the drawing in detail and first, particularly, to FIGS. 1 and 2 thereof, there is shown a cableway cabin or gondola 1 which can be coupled to a haulage cable via a suspension bar 2. Located at the top end of the suspension bar 2 is a clamping device 3 and a running-gear mechanism 4 with at least two running rollers. FIG. 2 illustrates, on an enlarged scale, a portion of the suspension bar 2, the clamping device 3, the running-gear mechanism 4 with the running rollers 5, a conveying rail 11, the haulage cable 12, and a friction surface 13, on which the conveying rollers act in the stations.

[0033] Since these configurations are known from the prior art, they will not be explained in any more detail in this context.

[0034] With reference to FIG. 3, the running-gear mechanism 4 is designed with at least two bearing bolts 41, on which a running roller 5 is mounted by means of a ball bearing 42. In order to fasten the ball bearing 42, the end surface of the bearing bolt 41 is designed as a securing cover 43 by means of which a securing ring 44 is retained. The securing ring engages axially over the ball bearing 42, as a result of which the latter is secured axially in position. The guide rail 11, in which the running rollers 5 are guided, is also illustrated.

[0035] As will be explained in detail in the following, the running rollers 5 comprise a roller body 51, which is produced from a metal, in particular from steel, and a running ring 61, which is produced from a plastic material, in particular from polyamide.

[0036] The running ring 61 ensures the sought-after guidance of the running rollers 5 in the guide rail 11 with a low level of noise.

[0037] The top part of the drawing illustrates a complete running roller 5, which is designed with the running ring 61 on its outer circumference. In contrast, the bottom part of the drawing illustrates the running roller 5 in the case of which the running ring 61 has broken off. In this case, it is necessary for the running roller 5 to ensure such emergency running properties that, despite the damage, a proper coupling operation is ensured. This is achieved when the running roller 5, even when the running ring 61 has been broken away, assumes virtually the same vertical position and the same lateral position, in relation to the guide rail 11, as the undamaged running roller. This requirement is met by the particular configuration of the running roller 5. The novel configuration will now be explained with reference to a number of exemplary embodiments hereinbelow.

[0038] As is illustrated in FIGS. 4 and 4a, according to a first embodiment, the roller body 51 is designed, on its outer circumference, with two spaced-apart ring-like protrusions 52 of which the diameter is approximately 90% of the diameter of the running roller 5 with the running ring 61 and in the case of which the distance between the outer side flanks is approximately 75% of the distance between the side flanks of the running roller 5 with running ring 61. This design ensures that, even in the event that the running ring 61 ruptures, the running roller 5 performs virtually the same function as the undamaged running roller 5, and that emergency running properties are thus ensured. This applies, on the one hand, in respect of the outer circumference of the ring-like protrusions 52, by means of which the running roller 5 is guided in the virtually correct vertical position in

the guide rail 11, and also in respect of the outer side flanks of the ring-like protrusion 52, by means of which the running roller 5 is guided in the guide rail 11 in respect of its lateral position such that it also assumes virtually the correct lateral position.

[0039] In order to achieve an optimum connection between the running ring 61 and the roller body 51, the ring-like protrusions 52 are formed with a multiplicity of bores 53 which have the material of the running ring 52 passing through them.

[0040] As can also be seen, the roller body 51 is of the width of the running roller 5 in the region of the hub and is designed to be somewhat narrower in the radially outer region, the roller body merging, in the direction away from there, into the ring-like protrusions 52.

[0041] FIGS. 5 and 5a illustrate a variant of the running roller 5a in which the roller body 51a is designed with just one annular protrusion 52a. In its bottom region, the roller body 51a is formed with a multiplicity of bores 53a which have the material of the running ring 61a passing through them. However, these bores are not absolutely necessary.

[0042] FIGS. 6 and 6a illustrate a further embodiment of such a running roller 5b, in which the roller body 51b is designed with a cross-sectionally T-shaped ring-like protrusion 52b. The T-bar of the cross-section is located at the radially outer end. In this case too, the necessary emergency running properties are provided by the outer circumference of the T-bar and the lateral flanks thereof. The T-shaped protrusion 52b is enclosed by the running ring 61b. In addition, bores 53b which pass through the T-shaped protrusion 52b are provided in the bottom region of said running rollers 5b. *However, they are not absolutely necessary.*

[0043] FIGS. 7 and 7a illustrate a further embodiment of such a running roller 5c. In this embodiment, the roller body 51c is designed with a protrusion 52c which runs in wave form over the circumference of the roller body 51c. This protrusion 52c is also enclosed by a running ring 61c.

[0044] In all the embodiments, the roller body itself, that is to say without the running ring, has an outer diameter of at least 85% to 95%, preferably of 90%, of the outer diameter of the running roller, and the distance between the outer side flanks of the at least one ring-like or wave-form protrusion is at least 65%, preferably 75%, of the distance between the side flanks of the running roller. This means that, even when the running ring has partly or completely broken off, the roller body achieves the necessary emergency running properties to the effect that, with the running rollers damaged, the roller body is guided in the guide rail in such a vertical position and in such a lateral position that a proper coupling operation with the supporting and haulage cable is ensured.

I claim:

1. A running roller for the traveling-gear mechanism of a transport assembly of a cableway system, comprising:

a pulley-type roller body formed of metal;

a running surface formed of plastic material enclosing said roller body about a circumferential periphery of said roller body.

2. The running roller according to claim 1, wherein said roller body is formed of steel.

3. The running roller according to claim 1, wherein said running surface defines an outer diameter of the running

roller, and said roller body is formed, on an outer circumference thereof, with at least one annular protrusion having an outer diameter of at least 80% of the outer diameter of the running roller.

4. The running roller according to claim 1, wherein the outer diameter of said annular protrusion is 90% to 95% of the outer diameter of the running roller.

5. The running roller according to claim 1, wherein lateral guide surfaces define a width of the running roller and said roller body is formed, on an outer circumference thereof, with at least one ring-like protrusion having side surfaces spaced apart from one another by a distance of at least 65% of the width of the running roller.

6. The running roller according to claim 5, wherein said side surfaces of said protrusion are spaced apart from one another by a distance of at least 75% of the width of the running roller.

7. The running roller according to claim 1, wherein said roller body is formed with throughholes along a circumference thereof, and the plastic material of said running surface passes through said throughholes.

8. The running roller according to claim 7, wherein said throughholes are bores formed in said roller body.

9. The running roller according to claim 1, wherein said roller body extends over an entire thickness of the running roller at a hub region thereof, and has a thickness of approximately 70% of the thickness of the running roller radially outside the hub region.

10. The running roller according to claim 1, wherein said roller body is formed, at a periphery thereof, with two ring-shaped protrusions having an outer circumference approximately 90% of an outer circumference of the running roller, said protrusions have outer wall surfaces spaced apart by a spacing distance of approximately 75% of a width of the running roller defined by lateral guide surfaces thereof, said protrusions are formed with through-holes, and a plastic material of said running surfaces passes through said through-holes.

11. The running roller according to claim 10, wherein said throughholes are bores formed in said roller body.

12. The running roller according to claim 1, wherein said roller body is formed, at a periphery thereof, with two ring-shaped protrusions having an outer circumference approximately 90% of an outer circumference of the running roller, said protrusions have outer wall surfaces spaced apart by a spacing distance of approximately 85% of a width of the running roller defined by lateral guide surfaces thereof, said protrusions are formed with through-holes, and a plastic material of said running surfaces passes through said through-holes.

13. The running roller according to claim 12, wherein said throughholes are bores formed in said roller body.

14. The running roller according to claim 1, wherein said roller body has an annular protrusion formed about a periphery thereof, said annular protrusion, in a radial section thereof, having a T-shape with a crossbar of the T-shape disposed along an outer circumference.

15. The running roller according to claim 1, wherein said roller body is formed with a protrusion having a meandering wave shape along a periphery of the running rollers.

* * * * *