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Rail vehicle, in particular a self-propelled rail vehicle

Technical Field

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The invention relates to a rail vehicle, in particular a self-propelled rail vehicle in accordance with the preamble of Claim 1. A contact element, co-operating with a conductor rail, of a transmission device serves
10 to transmit service current to an appropriate consumer, for example an electric motor, and/or control signals to and from appropriate control devices of the rail vehicle.

15 Such rail vehicles are suitable, in particular, for small conveying systems, for example in accordance with US-A-3 636 883.

Prior Art

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Rail vehicles of the type mentioned at the beginning are known, for example, from a small conveying system in accordance with US-A-3 636 883 and serve, for example, the purpose of horizontally to vertically
25 transporting small loads such as files, medical goods, components and many more. In this case, it is disadvantageous that the contact elements carrying the conductor rails slide on the conductor rails and lead to a high noise development, this being so, in
30 particular, when rail separators are run over. Moreover, wear is produced which soils not only the rail system and the vehicles, but also the surroundings, and this entails the risk of contamination, in particular when ultra clean rooms are
35 being traversed. This holds, chiefly, for driving metal-containing sliding contacts in semiconductor application. Again, the wear of the sliding contacts is relatively high, with the result that frequent



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maintenance and exchange of the contact elements are required.

Summary of the Invention

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It is the object of the invention to develop a rail vehicle of the type mentioned at the beginning in such a way that the noise development and the wear are reduced in conjunction with good transmission
10 performance of the transmission device.

According to the invention, the object is achieved by means of the characterizing features of Claim 1. Owing to the fact that the contact element is constructed as
15 a contact roller made essentially from carbon material and/or graphite material, which rolls on the conductor rail, the noise development and the wear are substantially reduced and this is the case, in particular, even when running over points, crossings,
20 rail separators, and the like. As a result, not only is a longer useful life of the contact rollers possible, but the soiling of the rail system, the rail vehicles and the surroundings is substantially reduced, so that it is even possible to run in ultra clean rooms, for
25 example in hospitals, without a rise in the risk of contamination. Nevertheless, good data transmission with current intensities in the mA region, constant loading in the region of up to 20 to 30 A and short-circuit currents for drive motors in the region of 100
30 A or more are rendered possible without damage to the contacts.

Advantageous refinements of the rail vehicle are described in Claims 2 to 7.

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In principal, axles made from various materials can be used for the contact roller, but a silvered axle in accordance with Claim 2 is particularly advantageous.

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The contact properties can be improved by mounting them in a floating fashion and thus by a higher adaptability of the contact roller with the conductor rail and the rail vehicle according to Claim 3 and/or by
5 prestressing the contact roller against the conductor rail according to Claim 4. Also particularly advantageous is a development according to Claim 5, the contact roller being supported in a bearing block which is, for example, supported in a holder of the rail
10 vehicle, preferably in a floating fashion. The design according to Claim 6 serves expedient prestressing of the bearing block and thus of the contact roller against the conductor rail.

15 The transmission power of the transmission device can be improved when, in accordance with Claim 7, at least two contact rollers are connected in series in the running direction.

20 Brief Description of the Drawing

Exemplary embodiments of the invention are described in more detail below with the aid of drawings:

25 Figure 1 shows a partially cut away section of a first embodiment of a rail vehicle with contact rollers supported on a conductor rail;

30 Figure 2 shows a partially cut away section of a second embodiment of a rail vehicle with contact rollers supported on a conductor rail.

35 Ways of Carrying out the Invention

The figures, in which the same elements are provided with the same reference numerals, illustrate the transmission device of a rail vehicle which co-operates

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with a conductor rail 10 in order to transmit service current and/or control signals from the latter to a self-propelled rail vehicle. Such a rail vehicle is preferably part of a small conveying system in accordance, for example, with US-A-3 636 883, and is intended for transporting small loads such as files, medical goods, components or the like.

In order to transmit the service current and/or the control signals to an electric drive motor 12 and/or other components and/or control units of the rail vehicle, there are present according to the invention contact rollers 14,16 which essentially consist of carbon material and/or graphite material and which transmit both small currents such as, for example, control currents in the region of 5 mA and also currents of the order of magnitude of up to 30 A in constant loading or short-circuit currents of the order of magnitude of 100 A for drive motors without difficulty, for example in the case of a service voltage of 24 volts but without increasing the risk of damage, for example destruction of the contacts.

In the exemplary embodiment, two contact rollers 14,16 are provided in the running direction, in order to transmit the currents. It is also possible to use only one contact roller or more than two contact rollers, and to arrange the latter next to one another in pairs, for example.

The contact rollers 14,16 are supported by a bearing block 18 which, for its part, is arranged in a holder 20 which forms a unit with the rail vehicle. The bearing block 18 has a U-shape in cross section and has side limbs with a trapezoidal geometry in the exemplary embodiment. Proceeding from the head part 22 of the bearing block 18 is a contact pin 24 which effects an electrically conducting connection with the drive motor 12 and/or control units which are not illustrated in

more detail. The bearing block 18 and thus the contact rollers 14,16 are electrically insulated against the holder 20.

5 In order to ensure a constant contact pressure of the contact rollers 14,16 against the conductor rail 10, a spring element 26 in the form of a coiled strip spring acts on the bearing block 18 and is supported in the holder 20. A free end section 28, bent in the shape of
10 a S, of the coiled strip spring 26 then acts on the head part 22 of the bearing block 18 such that in this way the required prestressing of the bearing block 18, and thus of the contact rollers 14,16 in the direction of the conductor rail 10 is ensured.

15 The spring element 26, which proceeds in the exemplary embodiment from the holder 20, is insulated against the bearing block 18. For this purpose, at least the end section 28 co-operating with the bearing block 18 can
20 be sheathed by an electrically insulating material.

The floating bearing of the bearing block 18 can be performed by virtue of the fact that either the preferably silvered axles 30,32 of the contact rollers
25 14,16 are adjustable in accordance with Figure 1 in elongated holes 34,36 of the holder 20 which run perpendicular to the conductor rails 10, or else the bearing block 18 is self-supported in accordance with Figure 2 via an axle 38 in corresponding elongated
30 holes 40 of the holder 20. It must be ensured in this case that the contact rollers 14,16 or their axles 30,32 or the axle 38 penetrating the bearing block 18 is electrically insulated against the holder 20 or the holder 20 itself is electrically insulated against the
35 remaining parts of the rail vehicle. The same holds with reference to the bearing block 18 itself.

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List of Reference Numerals

	10	Conductor rail
	12	Drive motor
5	14	Contact roller
	16	Contact roller
	18	Bearing block
	20	Holder
	22	Head part
10	24	Contact pin
	26	Spring element
	28	End section
	30	Axle of 14
	32	Axle of 16
15	34	Elongated hole for 30
	36	Elongated hole for 32
	38	Axle
	40	Elongated hole for 38

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PATENT CLAIMS

1. Rail vehicle with a device for transmitting service current and/or control signals, which has
5 a conducting contact element (14,16) co-operating with a conductor rail (10), characterized in that the contact element is constructed as a contact roller (14,16) essentially consisting of carbon material and/or graphite material.
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2. Rail vehicle according to Claim 1, characterized in that the contact roller (14,16) is provided with a silvered axle (30,32).
- 15 3. Rail vehicle according to Claim 1 or 2, characterized in that the contact roller (14,16) is mounted in a floating fashion.
- 20 4. Rail vehicle according to one of Claims 1 to 3, characterized in that the contact roller (14,16) is prestressed against the conductor rail (10).
- 25 5. Rail vehicle according to one of Claims 1 to 4, characterized in that the contact roller (14,16) is supported in a bearing block (18) which is arranged in a holder (20) of the rail vehicle, preferably in a floating fashion.
- 30 6. Rail vehicle according to Claim 5, characterized in that arranged in the holder (20) is a spring (26), preferably a coiled strip spring, which co-operates with the bearing block (18) and is preferably electrically insulated against the latter.
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7. Rail vehicle according to Claim 6 or 7, characterized in that the conductor rail (10) is assigned at least two contact rollers (14,16)

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which are situated in series and are arranged in the common bearing block (18).