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

(11) Publication number: **0 132 236**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 84830186.7

(22) Date of filing: 20.06.84

(51) Int. Cl.⁴: B 61 C 9/48

(30) Priority: 15.07.83 IT 6776883

(43) Date of publication of application:
23.01.85 Bulletin 85/4

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

(71) Applicant: FIAT FERROVIARIA SAVIGLIANO S.p.A.
Via Magenta 14
I-10128 Torino(IT)

(72) Inventor: Casalone Rinaldi, Roberto
Corso Fiume 16
I-10133 Torino(IT)

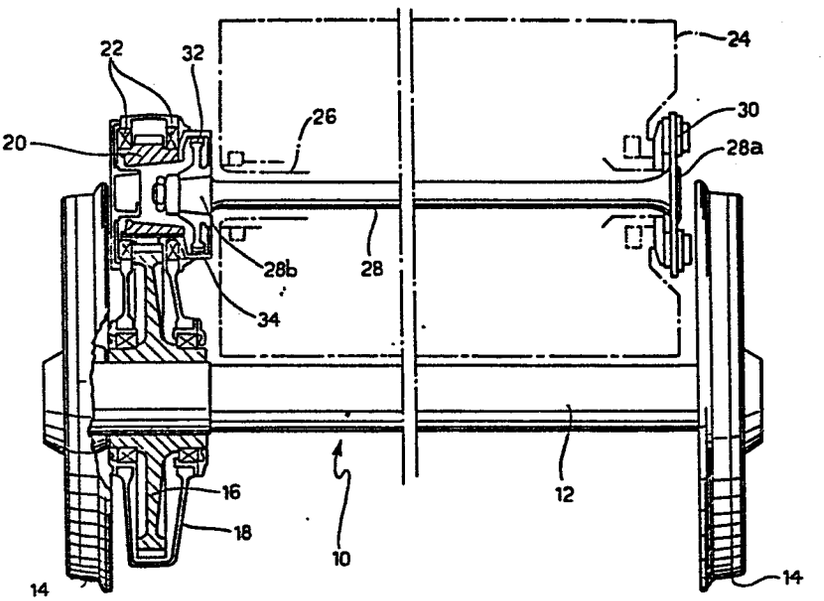
(74) Representative: Buzzi, Franco et al,
c/o Jacobacci-Casetta & Perani S.p.A. Via Alfieri, 17
I-10121 Torino(IT)

(54) Transmission for motorised bogies of railway vehicles.

(57) A transmission for a motorised bogie of a railway vehicle having an axle unit (10) the axle (12) of which is driven by an electric motor (24) carried by the bogie frame includes a transmission shaft (28) driven by the motor and driving a pinion (20) which meshes within a gearbox (18) with a gear wheel (16) keyed to the axle (12). The transmission shaft (28) is coupled to the pinion (20) by a toothed coupling (32) located in the gearbox (18) so that it is lubricated by the same lubricating oil as the said gearbox.

EP 0 132 236 A2

./...


22
32
24
26
20
30
28a
28b
28
34
16
18
12
10
14
14

Transmission for motorised bogies of railway vehicles

The present invention relates generally to motorised bogies for railway vehicles.

More particularly, the invention concerns a transmission for a motorised bogie with a motor-driven axle unit driven by an electric motor,supported by the frame of the bogie,through a transmission shaft one end of which is connected to the axle of the axle unit through a gearbox supported by the frame of the bogie or by the axle unit. The gearbox contains a pinion rotatably supported in the said box and a gear wheel keyed to the axle and meshing with the said pinion, and the connection between the transmission shaft and the pinion is effected by a toothed coupling.

Transmissions of this kind are used, inter alia, on the motorised bogies of electric locomotives, the motor of which, supported by the bogie frame, has a hollow shaft, generally parallel to the axle of the axle unit, which is traversed axially, with clearance, by the transmission shaft. In such locomotives the transmission shaft is coupled at one end, in a traditional manner, to the hollow shaft through the said toothed coupling, and at the other end to the said pinion through a flexible or articulated coupling so as to allow the necessary relative angular displacements between the axle and the hollow shaft of the motor.

In motorised bogies of vehicles of this kind the toothed coupling is therefore situated on the side opposite the gearbox, and is inserted within a suitable protective housing into which the appropriate

lubricant is injected.

With this solution, lubrication of the toothed coupling is separate and distinct from that of the gearbox, with the disadvantage that it needs a separate supplementary check during the bogie maintenance.

The object of the present invention is that of avoiding the said disadvantage and this object is achieved by virtue of the fact that in a transmission for motorised bogies of railway vehicles of the kind defined above, the said toothed coupling is fitted into the gearbox and is lubricated by the same lubricant as the latter.

One thus has the advantage of a better and more reliable lubrication and of simplification in the lubricant-level checking operations.

The invention will now be described in detail with reference to the accompanying drawing, supplied purely by way of non-restrictive example, which is a diagrammatic plan view, partly sectioned, of a part of a motorised bogie according to the invention.

In the example illustrated, reference numeral 10 indicates in its entirety one of the axle units of a motorised bogie, the axle 12 of which bearing the wheels 14 is connected by bushes to the frame, not shown in the drawings, of the bogie.

In proximity to one end of the axle 12 there is keyed a gear wheel 16 housed within a gearbox 18 articulated, in a manner known per se, to the bogie frame.

The gear wheel 16 meshes with a pinion 20 rotatably supported on roller bearings 22 within the

gearbox 18.

Indicated diagrammatically at 24 is an electric traction motor supported by the bogie frame , the shaft of which, illustrated diagrammatically at 26, is disposed generally parallel to the axle 12 of the axle unit 10, and is hollow.

The shaft 26 is traversed, with radial clearance, by a transmission shaft 28, the end 28a of which, remote from the gearbox 18, is coupled to the corresponding end of the hollow shaft 26, by means of a coupling with elastic inserts, or an articulated joint 30, of traditional kind.

The other end 28b of the transmission shaft 28 is coupled for rotation with the pinion 20 by a toothed coupling 32 located within an appendage 34 of the gearbox 18.

In operation, the transmission of drive from the hollow shaft 26 of the electric motor 24 to the axle 12 of the axle unit 10 takes place through the flexible coupling 30, the transmission shaft 28, the toothed coupling 32, the pinion 20 and the gear wheel 16 which allows, during travel of the bogie, the necessary vertical,longitudinal and lateral movements of the axle unit 10 in relation to the hollow shaft 26.

Thanks to the above described structure, lubrication of the toothed coupling 32 is effected by using the same lubricating oil as that used for the gears 16 and 20 circulating in the gearbox 18. This makes it possible to have better, more efficient, lubrication of the toothed coupling 22, and to avoid having to carry out additional lubrication level

checks of the said coupling 32, as happens on the other hand in the case of known transmissions, described above, in which the toothed coupling is lubricated autonomously and separately.

CLAIMS

1. A transmission for a motorised bogie of a railway vehicle having an axle unit (10) driven by an electric motor (25) supported by the bogie frame, comprising a transmission shaft (28) which is connected at one end to the axle (12) of the axle unit (10) through a gearbox (18) supported by the bogie frame or by the axle unit and containing a pinion (20) meshing with a gear wheel (16) keyed to the axle (12), the connection between the transmission shaft (28) and the pinion (20) being effected through a toothed coupling (32)

characterised in that

the toothed coupling (32) is located within the said gearbox (18) and is lubricated by the same lubricant as the said gearbox (18).

2. A transmission according to Claim 1, in which the motor (25) has a hollow shaft (26) generally parallel to the axle (12) of the axle unit (10), which is traversed axially by the said transmission shaft (28) and in which the transmission shaft (28) is coupled to the hollow shaft (26) of the motor and to the pinion (20) by two couplings, one of which (32) is toothed and the other of which(30) is of the elastic or articulated kind so as to allow vertical, longitudinal and lateral displacements between the axle (12) and the hollow shaft (26),

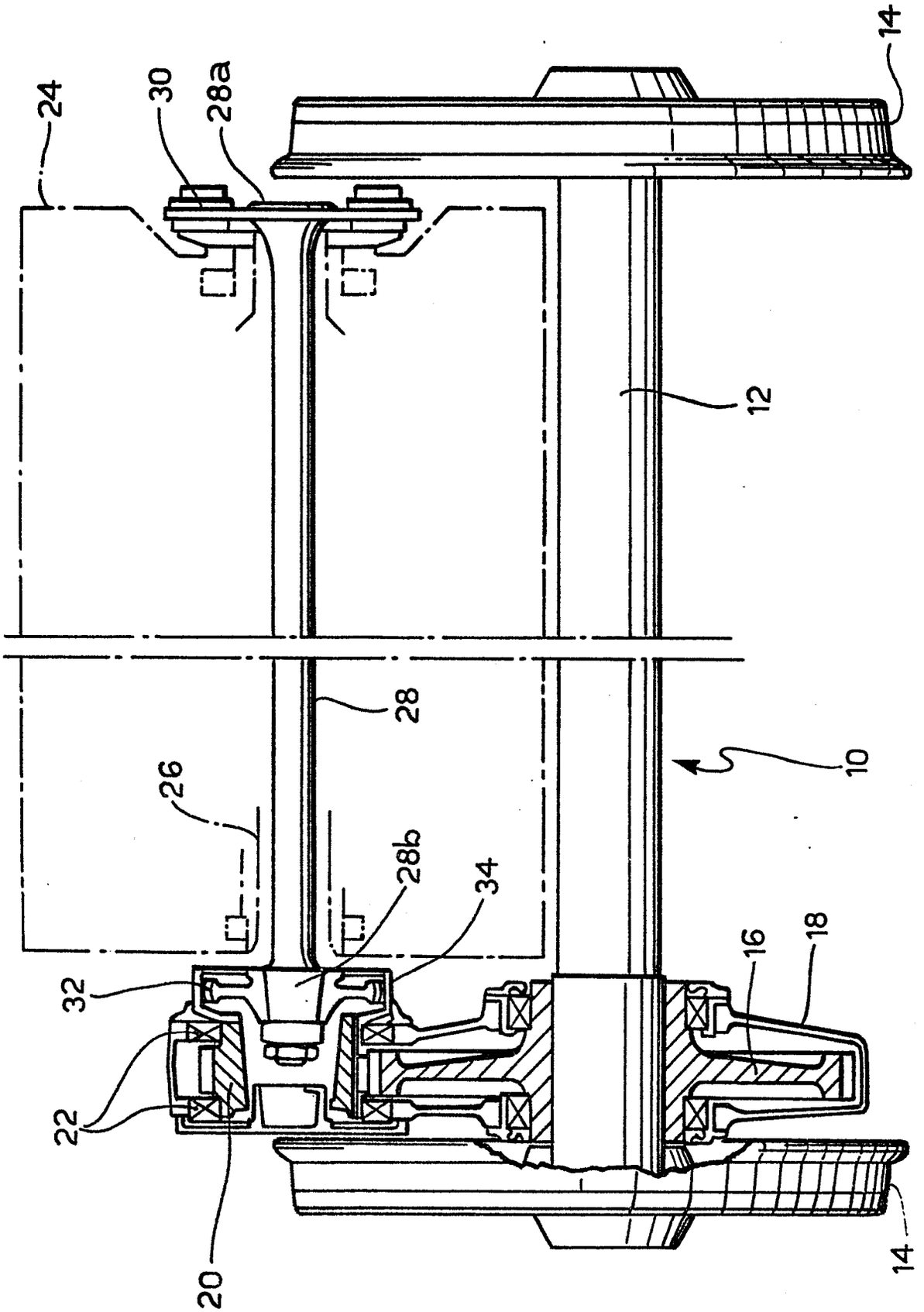
characterised in that

the elastic or articulated coupling (30) is interposed between the end (28a) of the transmission shaft (28) remote from the gearbox (18) and the adjacent end of the hollow shaft (26) whilst the said toothed coupling (32) directly couples the transmission shaft (28) to the pinion (20).

3. A motorised bogie including a frame and an axle unit (10) the axle (12) of which is driven by an electric motor (24) supported by the frame and which has a hollow shaft (26) generally parallel to the axle (12), one end of said shaft (26) being rotationally coupled to one end (28a) of a transmission shaft (28) which extends axially through the said hollow shaft (26) and the opposite end (28b) of which is coupled to the axle (12) of the axle unit (10) through a gearbox (18) which is supported by the bogie frame and which contains a pinion (20) rotatably supported by the gearbox , and meshing with a gear wheel (16) keyed to the axle (12), the transmission shaft (28) being coupled to the hollow shaft (26) and to the pinion (20) by two couplings one of which (32) is of the toothed kind and the other of which (30) of the elastic or articulated kind, so as to allow angular displacements between the axle (12) and the hollow shaft (26) of the motor,

characterised in that

the toothed coupling (32) couples the transmission shaft (28) to the pinion (20) and is located within the said gearbox (18).


14
24
30
28a
12
28
10
26
28b
34
16
18
32
22
20
14