

## DRIVEN TROLLEY FOR SUSPENSION FROM AND TRAVEL ON A RAIL

The invention concerns a driven trolley for suspension from and travel on a rail. The invention particularly but not exclusively relates to a line trolley for use with a drag line device.

Similar line trolleys are described for example in German Patent DE 26 28 112 C2 of the Applicant. In this case, these are passive line trolleys, i.e. line trolleys without their own drive. In addition, there are driven line trolleys in particular for use with heavy loads, for example with a linear motor drive or with a gearbox motor drive using a direct current motor which drives the main supporting wheels by means of toothed belts or a separate driving wheel by means of a friction wheel drive.

Such known drives for line trolleys have the drawback that a gearbox has to be used in order to reduce the high speed of the direct current motor to the speed required to drive the supporting wheels. Mostly a bevel gear gearbox is used for this. However, each gearbox means additional production effort and cost and takes up a considerable amount of space. This is disadvantageous in particular because in the case of line trolleys space is often at a premium and a low unit height is imperative. The known drive methods are particularly disadvantageous when it is necessary to drive a plurality of supporting wheels, for example on both sides of the supporting rail, since complicated idler gears and ratios are required in the drive line for this purpose. Due to the slip occasionally occurring during operation of the line trolley, the known driven line trolleys must also have slip clutches for all the driven supporting wheels in order to prevent damage to the drive.

Therefore, the object of the present invention is to provide a driven trolley so that the supporting wheels can be driven at low cost while requiring little space.

According to the present invention a driven trolley for suspension from and travel on a rail, said trolley comprises a pair of co-axial supporting wheels carried on

rails, the said supporting wheels being disposed for location on each side of said

rail, a driving motor having a driving shaft parallel with said supporting wheel shafts, and the ends of the motor driving shaft being connected by first and second belt drive means to said supporting wheel shafts.

The invention can be performed in various ways but one embodiment will now be described by way of example and with reference to the accompanying drawings, in which:

Figure 1 is a side view of the trolley according to the invention suspended on a supporting rail, and

Figure 2 is a front view of the trolley shown in Figure 1.

The trolley 1 illustrated in Figs. 1 and 2 is suspended by means of four supporting wheels, three of which are designated 4, 4' and 5, on a rail 2 with a double-T cross-section, which is shown best in Fig. 2. The supporting wheels 4, 4' and 5 run on the inner transverse surfaces of the lower (inverted) T. In each case, two supporting wheels, namely the supporting wheels 4 and 4' and the supporting wheels 5' are arranged co-axial with one another and in each case run on one side of the rail 2. The shafts 7 and 7' and 8 of the two pairs of supporting wheels are parallel to one another. Each supporting wheel is connected by means of a hub 17 to the trolley 1. The shafts 7, 7' and 8 of the supporting wheels 4, 4' and 5 run through bearing hubs 17, and on the outside protrude therefrom. Driving wheels 18, 19 and 20 are secured on the outer ends of the shafts 7, 7' and 8 so that rotation of these driving wheels 18, 19 and 20 causes leads to rotation of the associated supporting wheels 4, 4' and 5.

While supporting wheels 4, 4' and 5 have shafts running horizontally, additional guiding wheels 21, 22 and 23 associated with each supporting wheel 4, 4' and 5 are provided with vertical shafts, the axes of the guiding wheels 21, 22 and 23 intersecting with those of the supporting wheels 4, 4' and 5. The horizontally arranged guiding wheels 21, 22 and 23 serve for lateral guidance of the trolley 1 and to this end bear on the ends of the transverse members of the inverted T of the double-T shaped rail 2.

## CLAIMS

1. A driven trolley for suspension from and travel on a rail comprises a pair of co-axial supporting wheels carried on shafts, one of said supporting wheels being disposed for location on each side of said rail, a driving motor having a driving shaft parallel with said supporting wheel shafts, and the ends of the motor driving shaft being connected by first and second belt drive means to said supporting wheel shafts.

2. A trolley as claimed in Claim 1, in which a second set of co-axially disposed supporting wheels is provided on both sides of the rail.

3. A trolley as claimed in Claim 2, in which the second set of supporting wheels is also connected by means of the first and second belt drive means with the ends of the driving shaft and thus driven.

4. A trolley as claimed in any one of the preceding Claims, in which the driving motor is disposed on an arm which can be adjusted and fixed and the adjustment of which changes the tension of each belt of the belt drives means.

5. A trolley as claimed in any one of the preceding Claims, in which the driving motor is a three-phase motor which is actuated by a frequency changer and thus variable in its speed by changing the control frequency.

6. A trolley as claimed in Claim 5, in which in the event of a rise in current as a result of a reduction in the speed of the trolley the frequency changer adapts the frequency to the new speed accordingly.

7. A trolley as claimed in any one of the preceding Claims, which includes a line carrying device and is provided with a rail with an I shaped cross-section for use with a drag line device.

8. A trolley substantially as described herein with reference to and as shown in the accompanying drawing.

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### ABSTRACT

The invention concerns a driven trolley 1 for suspension from and travelling on a rail 2, with a driving motor 3 and at least one supporting wheel 4, 4', 5' driven by the latter and travelling on the rail 2. Known trolleys of this type, which in particular are used as line trolleys, have the drawback that they require a gearbox, which is costly and takes up a lot of space. The object of developing a driven trolley so that the supporting wheels 4, 4', 5' can be driven at low cost while requiring little space is achieved in that the driving motor 3 is fitted with its driving shaft 6 parallel to the or each shaft 7, 7', 8 of the supporting wheels 4, 4', 5 and at least one end 11 of the driving shaft 6 is connected by means of a first belt drive 9 with the or each shaft 7, 7', 8 of the supporting wheels 4, 4', 5.

Fig. 1