

This invention relates to a track-laying vehicle according to the preamble of claim 1.

A track-laying vehicle of this type is known from DE-OS 37 25 920, in which the track-laying mechanism consists of two modules, fixed to the side walls of the vehicle trough, each module having a track-laying assembly support carrying the components of the track-laying assembly, which is fixed to the side wall with a vibration-insulating material of large area between them. With this type of fixing, account must be taken of the high loading values, which are transferred to the track-laying assembly support, on the one hand via the assembly rollers and on the other hand via the guide roller and driving wheel due to the tension of the track, and which necessitate a particularly strong fixing at the force-transmitting zones to the side wall of the vehicle trough. For this purpose, also, the track-laying assembly support must be as stiff as possible and therefore of heavy construction.

The objective of the present invention therefore is, in a track-laying vehicle having vibration-decoupled track mechanism, to reduce the expense of construction and total weight while still assuring optimum forms of loading for the elastomer material situated between vehicle trough and track-laying assembly support.

This objective is achieved according to the features from the characterization part of claim 1.

The invention is based upon the knowledge that, by tension coupling of the mutually facing track-laying assembly supports, the action of the forces introduced into these supports can be cancelled out or at least largely reduced.

In one preferred form of embodiment, the two track-laying assembly supports are connected together by tie-bars running beneath the bottom plate of the vehicle trough. The effect of the forces introduced into the track-laying assembly supports by the track rollers, which create mutually opposed moments in their lower regions, is thus cancelled.

In order to eliminate the moment loading, which is introduced into the track-laying assembly support through the guide wheel and drive wheel because of the inwardly directed track stress, tie-bars connecting together the two track-laying assembly supports are disposed at the front and/or rear wall of the vehicle trough.

Preferably, in a track-laying vehicle with track rollers having torsion bar suspension, the torsion bars are simultaneously used also as tension bars for coupling the two track-laying assembly supports.

Advantageously, the track-laying assembly support is provided, in the space bounded by the track rollers, support rollers and guide wheel and driving wheel inside the dimensions of the tracks, with a stiffening, which gives this support a higher bending stiffness, which counteracts in particular a deformation of the track-laying assembly support by the forces of the track which is under tension loading, acting through the guide wheel and drive wheel. This stiffening, which preferably is

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constructed as a closed box girder, is particularly suitable for supporting other elements of the track-laying assembly, such as dampers and shock absorbers, because their mounting is no longer over hung, that is no longer needs to be accepted at one end only at the basically vertical side wall or support plate of the track-laying assembly support, but can be accepted at both ends.

Since, because of the coupling of the track-laying assembly supports by the tie rods, the moment loading that otherwise would arise in the lower region of the track-laying assembly supports due to the forces introduced via the track rollers and support arms, is largely eliminated, improved loading conditions are obtained. Thus, only punctiform bearings of elastomeric, vibration-damping material are sufficient for accepting the difference forces that result from the different moment loadings of the two track-laying assembly supports.

The fixing solely by punctiform bearings offers furthermore, a more favourable damping action than a connection of large area between track-laying assembly support and side wall by means of elastomeric material.

The invention is described in more detail below with reference to the drawing.

The figures in the drawing show:

- Fig. 1 in schematic view, a cross-section through a track-laying vehicle with track-laying assembly supports that are coupled together beneath the bottom plate of the vehicle trough by tie-bars,
- Fig. 2 the cross-section through a track-laying vehicle according to Fig. 1, but with the torsion bar springs of the track mechanism as tie-bars,
- Fig. 3 in schematic view, a plan on the vehicle trough, with drive wheel and guide wheel illustrated on one side,
- Fig. 4 a detail view of the drive shaft leading from the vehicle transmission, through the side wall of the vehicle trough, to the driving wheel,
- Fig. 5 a detail view of the torsion bar springs passing through the side wall of the vehicle trough,
- Fig. 6 a detail view of the damper mounted in the track-laying assembly support and,
- Fig. 7 a detail view of the support arm housing, mounted in the track-laying assembly support and in its box-shaped stiffening.

Fig. 1 shows the vehicle trough 1 of a track-laying vehicle, at the side walls 2 and 3 of which are disposed a left and right track-laying assembly. Each track-laying assembly consists of a track-laying assembly support 4, which is composed of a support plate 5 and a stiffening in the

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form of a box section 6. On the track-laying assembly support, track rollers 8 are mounted by support arms 7. The track-laying assembly supports 4 are fixed to the side walls 2 and 3 by basically punctiform bearings 9, which are of an elastomeric, vibration-damping material. The track-laying assembly supports 4, mounted on the side walls 2 and 3, are connected together by tie-bars 11, running underneath the bottom plate 10 of the vehicle trough 1.

When stationary or in movement, moments M_1 and M_2 are introduced into the lower region of the track-laying assembly supports 4 via the track rollers 8 and the support arms 7, but these moments, because of the coupling of the two mutually opposite track-laying assembly supports by the tie-bars 11, cannot lead to forces which would result in the track-laying assembly supports lifting off the side walls 2 and 3. The punctiform bearings 9 need to be designed only to accept the forces resulting from the difference between the moments M_1 and M_2 and possess more favourable properties with regard to the absorbing of the vibrations originating from the track-laying mechanism.

The track-laying vehicle of Fig. 2 corresponds basically to the track-laying vehicle of Fig. 1, but has tie-bars 12 which at the same time serve as torsion bar springs for the suspension of the track rollers 8.

The track-laying vehicle according to Fig. 3 possesses a left track-laying assembly support 4 with a front guide wheel 13 and rear driving wheel 14. The arrows F_3 and F_4 indicate the chain tensile force, which in the front and rear regions lead to forces which would result in the track-laying assembly supports 4 lifting off the side wall 2 in these regions, if these forces were not compensated by tie-bars 11, connected to the opposite track-laying support. These tie-bars 11 pass in front of the front wall 15 and rear wall 16 of the vehicle trough.

Fig. 4 shows, in a detailed partial view, the passage of the drive shaft 17 for the driving wheel 14 through a side wall of the vehicle trough 1 and the support plate 5, where an annular element 18 of elastomeric material is disposed between support plate 5 and side wall, which constitutes an annular support element and by which the aperture through the side wall of the vehicle trough 1 is sealed.

In similar manner, the passage of the torsion bar springs through the side wall 2 or 3 and the support plate 5 of the track-laying assembly support 4 shown in Fig. 5 is constructed, where once again a sealing annular element 18 of elastomeric material is disposed between the side wall 2 and support plate 5.

Fig. 6 shows in detail view the doubly supported mounting of a damper 19 in the support plate 5 and in a wall of the box section profile 6, parallel to the support plate 5.

Fig. 7 shows in detail the track-laying assembly support 4, consisting of the support plate 5 and the placed-on box section 6, the support arm casing 20 for the support arm 7 and the associated torsion bar spring for a track roller 8 being disposed in the lower region of the track-laying assembly support 4. By the combined fixing of the support arm casing 20 to the support plate 5 and to the placed-on box section 6, an increase in the stiffness of the track-laying assembly support 4 is obtained.



Claims

1. Track-laying vehicle, comprising a vehicle trough (1) and a track-laying assembly, disposed at each of the two side walls (2 and 3) of the vehicle trough 1, the track-laying assembly components of which, such as the guide wheel (13), the track rollers (8) with support arms (7), the support rollers and the driving wheel (14) in engagement with the track, are mounted on a track-laying assembly support (4), which is fixed one to each side wall (2,3) of the vehicle trough (1), with a vibration-damping material disposed in between, characterized in that the track-laying assembly supports (4) are fixed to the side walls (2,3) of the vehicle trough (1) only by substantially punctiform bearings (9) of vibration-damping material, and are connected to each other by tie-bars (11, 12).
2. Track-laying vehicle according to claim 1, characterized in that the tie-bars (11) are disposed beneath or above the bottom plate (10) of the vehicle trough (1) transversely to the vehicle longitudinal axis.
3. Track-laying vehicle according to one of claims 1 or 2, characterized in that the tie-bars (11) are disposed horizontally and parallel to the rear wall (16) of the vehicle trough (1).
4. Track-laying vehicle according to one of claims 1 to 3, characterized in that the tie-bars (11) are disposed horizontally and parallel to the front wall (15) of the vehicle trough (1).
5. Track-laying vehicle according to one of claims 1 to 4, characterized in that, in the case of a track-laying assembly in which the support arms (7) carrying the track rollers (8) are supported by torsion bar springs extending transversely above or below the bottom plate (10) of the vehicle trough (1), one or more of the torsion bar springs are the tie-bars (12).
6. Track-laying vehicle according to one of claims 1 to 5, characterized in that an opening in the side wall (2,3), through which the drive shaft (17) for the driving wheel (14) passes, is surrounded by an annular element (18) of elastomeric material disposed between the side wall (2,3) and the track-laying assembly support (4), which element is one of the punctiform bearings (9).
7. Track-laying vehicle according to one of claims 1 to 6, characterized in that, in the case of apertures in the side wall (2,3) through which the torsion bar springs of the track rollers (8) pass, the apertures are each surrounded by annular elements (18) of elastomeric material, disposed between the side wall (2,3) and the track-laying assembly support (4), which elements form the punctiform bearings (9).
8. Track-laying vehicle according to one of claims 1 to 7, characterized in that the track-laying assembly support (4) consists basically of a support plate (5) parallel to the side wall (2,3),

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which (support plate) possesses, in the space bounded in the vertical direction by the track rollers (8) and the support rollers and in the longitudinal direction by the guide wheel (13) and the driving wheel (14), a stiffening in the form of a tunnel-shaped, substantially closed box section (6).

9. Track-laying vehicle according to claim 8, characterized in that the mounting of track-laying assembly additional components, such as for example dampers (19), track tensioners or end stop dampers, is disposed in the stiffening.
10. Track-laying vehicle according to one of claims 8 or 9, characterized in that the support arm casings (20) of the support arms (7) are supported both on the support plate (5) and also on the stiffening of the track-laying assembly support (4).