HU000029749T2

(19) **HU**

(11) Lajstromszám: **E 029 749**

(13) **T2**

MAGYARORSZÁG
Szellemi Tulajdon Nemzeti Hivatala

EURÓPAI SZABADALOM
SZÖVEGÉNEK FORDÍTÁSA

(21) Magyar ügyszám: **E 11 004506**

(51) Int. Cl.: ***E01B 7/02*** *(2006.01)*

(22) A bejelentés napja: **2011. 06. 01.**

(96) Az európai bejelentés bejelentési száma:
EP 20110004506

(97) Az európai bejelentés közzétételi adatai:
EP 2402506 A2 **2012. 01. 04.**

(97) Az európai szabadalom megadásának meghirdetési adatai:
EP 2402506 B1 **2016. 08. 31.**

(30) Elsőbbségi adatok:
102010025770 **2010. 07. 01.** **DE**

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(54) **Görgőszerkezet vasúti váltó csúcssínjéhez**

Roller device for a switch tongue

DESCRIPTION

The invention relates to a rolling device for a switch rail of a pair of points assigned to a stock rail, comprising a roller carrier receiving at least one roller, which roller carrier is spring-mounted via a spring element on a rail bearing plate configured as a sliding plate or a slide chair plate, wherein the switch rail rests on the roller, at least during the adjustment process, and the roller carrier is arranged in a pivotable, spring-mounted manner on a retaining plate connected to the rail bearing plate and about a spindle of the retaining plate.

Rolling devices configured in this manner are sufficiently known in the state of the art from JP H 11 278 271 A, which is the closest prior art, and WO 2008/106708 and allow the switch rail to be raised slightly during the opening or adjustment process, so that it no longer has any contact with the slide chair or the sliding surface of the rail bearing plate. The switch rail moves during this over roll or roller bodies which cause a significant reduction in the switch operation forces and allow freedom from lubricant on the slide chairs or sliding surfaces.

For accurate height adjustment of the uppermost tangential plane of the rollers, these are spring-mounted, as also described in DE 295 09 342 U1, for example.

In this case, the roller bearing exerts a purely carrying function during the adjustment process, so that the switch rail lies on the slide chair or the sliding surface of the rail bearing plate in position abutting the stock rail.

In this so-called "closed" state, the switch rail lies within the points arrangement with its tongue tip on the stock rail and with its root region or switch rail web on supporting cleats or spacer blocks. After prolonged operational use, i.e. by driving over the switch rail multiple times with a full wheel load in the root region, the predefined or pre-bent form of the switch rail changes in the longitudinal rail direction. The change in shape means that the switch rail no longer comes to rest against the supporting cleats or spacer blocks in the web region. When run over, this state may lead to substantial wear to the slide chairs or sliding surfaces of the rail bearing plates as, in an unwanted manner, the switch rail is only brought to bear against the supporting cleats by the transverse force of the wheel which is running over. In this case, quite substantial frictional forces occur between the underside of the tongue foot and the slide chair or sliding surfaces of the rail bearing plate in each case, due to the vertical wheel force which acts in addition.

In order to avoid this disadvantage, it has been disclosed by EP 0 654 561 B1 that a roller carrier with at least one receiving means for at least one roller is retained in a spring-mounted manner in the direction of the stock rail, as a result of which the switch rail is in abutment with the stock rail via the roller and the resistance during movement of the switch rail is thereby kept low.

For this purpose, the roller is partially pushed under the switch rail via a leaf spring. A corresponding fixing of the roller against the force of a separate spring in abutment with the foot of the switch rail can then be achieved by spacer pieces.

The present rolling device is mounted via the leaf springs and holding elements provided at their respective ends on two adjacent turnout sleepers of a track bed and therefore lies in the centre of the ballast crib formed between two turnout sleepers.

The rolling device thereby projects into the tamping region for consolidating ballast beneath the turnout sleepers. This means that the rolling device must be dismantled before the ballast is tamped, then reassembled and subsequently readjusted.

In addition, this rolling device can only be installed if the points system with normal-track sleepers has been erected on site. This leads to additional working expense and time delays on site.

The problem addressed by the invention is that of creating a generic rolling device in which the rollers can be exactly positioned, both in terms of their height and also horizontally in relation to the switch rail, and existing points can be modified without a great amount of work.

This problem is solved according to the invention in that the roller carrier is located immediately to the side next to the rail bearing plate between two turnout sleepers or rail fastening points, wherein the piston rod is guided through a vertical leg of the roller carrier and a limit stop configured below a horizontal leg with a gap to the roller on the retaining plate and a threaded nut is screwed to its projecting threaded end.

The overall arrangement for the spring-loaded tilting of the roller supporting the switch rail and pressing against the supporting cleats and the stock rail in the abutting position is therefore an integral element of a rail bearing plate in each case.

The spring element connected to the roller carrier and the retaining plate in this case acts via its spring means, for example a plate or spiral spring, on the vertical leg of the roller carrier with a defined, permanently applied spring force.

In the distal position of the switch rail from the stock rail or else during the adjustment process from the position abutting the stock rail to the distal position, the roller carrier is pressed down via the switch rail foot resting on the roller and the load of the switch rail against the spring force. The pretension of the spring means in this case is chosen in such a way that despite the load through the switch rail, the apex of the roller lies above the rail bearing plate and the switch rail therefore lies on the roller in the distal position or during the adjustment process with a gap to the rail bearing plate.

In the abutting position of the switch rail to the stock rail, the so-called functional position in the points, the spring means relaxes and the spring force pivots the roller carrier in the direction of the limit stop of the retaining plate. Associated with this, the roller lies below its upper apex in abutment with the tongue foot of the switch rail and presses said switch rail with the preset, defined spring force against the stock rail or the supporting cleats.

In the rolling device according to the invention which, for adjustment of the switch rail, may also exhibit a plurality of rollers arranged behind one another or alongside one another in the roller carrier,

there is therefore no connection to adjacent turnout sleepers or rail bearing plates of a points system. The tamping region is unobstructed and freely accessible at all times.

This means that the retaining plate and the roller carrier connected thereto in a pivotably movable manner via a spindle and also a spring element subjecting said roller carrier to a preset spring force can be preassembled on the rail bearing plate at a workshop. On site, in the points system, only the horizontal spacing of the roller carrier in respect of the stock or switch rail need then be set during initial assembly of the roller device on a normal-track sleeper, for example. For this purpose, the retaining plate is advantageously provided with elongated holes running in a longitudinal direction to the rail bearing plate.

A preferred embodiment of the invention envisages that the roller carrier is configured as an angle profile, the leg whereof extending horizontally to the retaining plate receives the roller and the vertically downwardly extending leg whereof is acted upon by the spring element. The angle profile and the spring element acting on the vertical leg are arranged transversely to the stock rail below the switch rail in this case. On the one hand, this arrangement ensures effective protection from damage and, on the other hand, there is still sufficient free space between the turnout sleepers, so that consolidation of the traditional ballast by tamping can still be performed in this region, even after the rolling device has been assembled.

Further details and features of the invention result from the claims and the following description in which an exemplary embodiment of the invention represented in the drawings is explained in greater detail. In the figures:

Fig. 1 shows a rolling device disposed on a turnout sleeper of the points in the position of the switch rail distal from the stock rail, as a cross section through the rails;

Fig. 2 shows the rolling device according to Fig. 1 with the oppositely abutting switch rail;

Fig. 3 shows as a detail from Fig. 1 and 2 the rolling device with spring element as an overall perspective view and

Fig. 4 shows a plan view of Fig. 2.

A rail bearing plate 1 configured with a rolling device is depicted in Fig. 1 as a detail of a points adjustment system shown without an adjustment and closing mechanism based on the example of one of the two sections of track running spaced apart parallel to one another, which rail bearing plate is mounted on a turnout sleeper 2 - made of concrete, for example - for switching the switch rails. The rail bearing plate 1 is configured as a slide chair 3 in which a stock rail 4 is clamped, on the one hand, and, on the other hand, a bearing surface 5 for a switch rail 6 is provided.

Disposed on the stock rail 4 are supporting cleats 7 facing the switch rail 6, one of which can be identified in the figures. In one points mechanism, the switch rail 6 lies in a functional position over the length of the points of the stock rail 4 in a slightly curved extension, i.e. on the one hand spaced apart by the supporting cleats 7 which bear against the switch rail web 8 – as shown in Figs. 2 and 4 – and, on the other hand, in abutment with the tongue tip of the switch rail 6 on the stock rail 4.

A roller device 9 is provided to support the points adjustment system, in order to move the switch rail 6 into a position distal from the stock rail 4 (Fig. 1) or to displace it from this position into the functional position in abutment with the supporting cleats 7 (Fig. 2) or the stock rail 4.

The rolling device 9 has a retaining plate 10 which is longitudinally displaceable on the rail bearing plate for positioning via elongated holes 11 and is fixedly connected, e.g. screwed, to the rail bearing plate 1 in the final set position.

On an end of the retaining plate 10 projecting beyond an outer side of the rail bearing plate 1 and the turnout sleeper 2, a roller carrier 13 is arranged in a pivotably movable manner on a spindle 12 of the retaining plate 10. The roller carrier 13 is configured as an angle profile 14, the horizontally running leg 15 whereof receives a roller 17 in a U-shaped intermediate space 16, which roller is mounted there in a free-wheeling manner via a pivot 18. The vertically running leg 19 of the roller carrier 13 is acted on by a spring element 20 with a permanently applied spring force. It can be seen from Fig. 4 that the roller carrier 13 is arranged between two turnout sleepers 2, optionally two rail fastening points 30.

The spring element 20 has a cylindrical housing 21 which encloses a spiral spring 25 resting on a plate 22 of a piston rod 23 and opposite on the housing wall 24. The piston rod 23 extends from the housing 21 with a lengthened end and is passed through the vertical leg 19 of the roller carrier 13 and a limit stop 26 formed on the retaining plate 10. A threaded nut 28 is screwed onto a free threaded end 27 of the piston rod 23.

By loosening or tightening the threaded nut 28, the pretensioning of the spiral spring 25 can be changed and a defined spring force can thereby be set, with which the roller carrier 13 and therefore the roller 17 is acted on.

The adjustment of the spring force allows a height adjustment of the roller 17 in relation to the bearing surface 5 of the slide chair 3. In other words, the degree to which the apex of the roller 17 projects upwardly over the bearing surface 5 and, associated with this, the foot 29 of the switch rail 6 is raised to a greater or lesser extent from the bearing surface 5 is thereby set (cf. Fig. 1 in this respect).

In the adjacent position according to Fig. 2, in which the foot 29 of the switch rail 6 lies on the bearing surface 5, the spiral spring 25 relaxes and pivots the roller carrier 13 with its vertical leg 19 in the direction of the limit stop 26, wherein the roller 17 then presses the switch rail 6 with a defined spring force in the direction of the supporting cleats 7 until it is in abutment. In order to guarantee this function, the vertical leg 19 is always spaced slightly apart from the limit stop 26.

If vibrations are introduced into the switch rail 6 when the points are passed over, these can be absorbed via the spring element 20 and damped, without the switch rail 6 being struck in respect of the supporting cleats 7 or the bearing surface 5.

List of reference numbers:

1 Rail bearing plate (sliding plate or slide chair plate)

2 Turnout sleeper

3 Slide chair
4 Stock rail
5 Bearing surface (of the slide chair)
6 Switch rail
7 Supporting cleat
8 Switch rail web
9 Rolling device
10 Retaining plate
11 Elongated hole
12 Spindle
13 Roller carrier
14 Angle profile (of the roller carrier)
15 Horizontal leg/horizontal leg
16 U-shaped intermediate space
17 Roller
18 Pivot
19 Vertical leg/vertical leg
20 Spring element
21 Housing
22 Plate of the piston rod
23 Piston rod
24 Housing wall
25 Spring / spiral spring
26 Limit stop
27 Threaded end
28 Threaded nut
29 Switch rail foot
30 Rail fastening point

GÖRGŐSZERKEZET VASÚTI VÁLTÓ CSÚCSSÍNJÉHEZ

SZABADALMI IGÉNYPONTOK

1. Görgőszerkezet (9) vasúti váltó tősínjéhez (4) tartozó csúcssínhez (6), ami tartalmaz egy, legalább egy görgővel (17) ellátott görgőtartót (13), ami egy csúszólapként vagy váltósín székként kialakított sínalátét lapon (1), egy rugóelemen (20) rugalmasan van ágyazva, ahol a csúcssín (6) legalább a váltóállításkor a görgőn (17) fekszik fel, és a görgőtartó (13) egy, a

sínalátét lappal (1) összekapcsolt tartólapon (10) és egy, a tartólap (10) egy tengelye (12) körül billenthetően és rugalmasan van elrendezve, ahol a rugóelem (20) tartalmaz egy, egy házban (21) egy dugattyúrúd (23) tányérján (22) és azzal szemben a ház egy falán (24) feltámaszkodó rugót (25), azzal jellemezve, hogy a görgőtartó (13) oldalt, közvetlenül a sínalátét lapon (1), beépített állapotban két váltótalpfa (2) vagy sínrögzítési pont (30) között van, és hogy a dugattyúrúd (23) a görgőtartó (13) egy függőleges ágán (19) és egy, a vízszintes nyúlvány (15) alatt a tartólapon (10) kialakított tükrözön (26) lévő görgőhöz (17) légréssel van átvezetve, és előrenyúló menetes végére (27) egy csavaranya (28) van felcsavarozva.

2. Az 1. igénypont szerinti görgőszerkezet,
azzal jellemezve, hogy
a rugóelem (20) a görgőtartón (13) előre meghatározott, jól definiált rugóerővel támaszkodik.

3. Az 1. vagy 2. igénypont szerinti görgőszerkezet,
azzal jellemezve, hogy
a görgőtartó (13) szögprofilként (14) van kialakítva, aminek vízszintes, a tartólap (10) felé nyúló ága (15) a görgőt (17) tartja, és függőlegesen lefelé nyúló ágán (19) a rugóelem (20) támaszkodik.

4. Az 1 – 3. igénypontok bármelyike szerinti görgőszerkezet,
azzal jellemezve, hogy
a rugóelem (20) a tősínre (4) keresztirányban, a csúcssín (6) alatt van elhelyezve.

Fig. 1

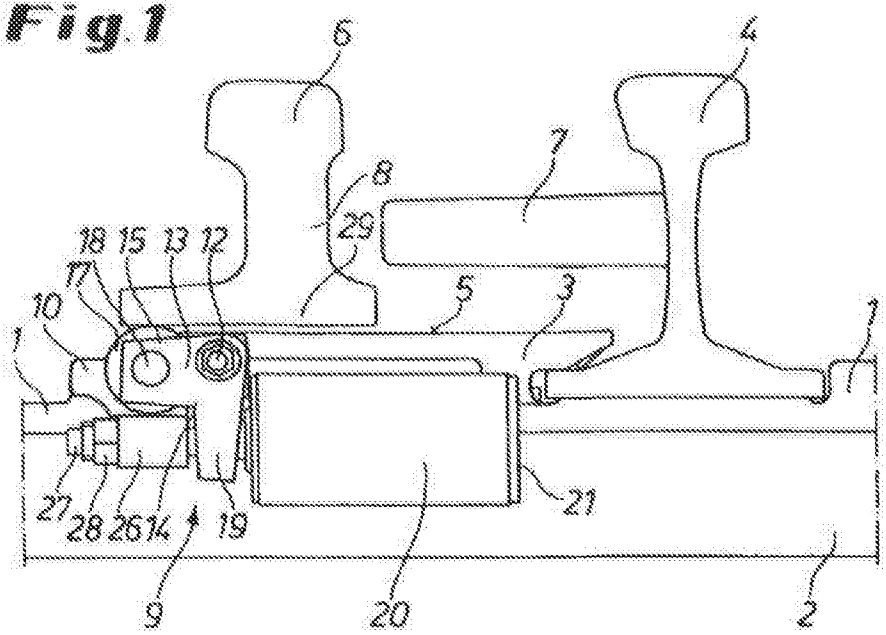

Fig. 2

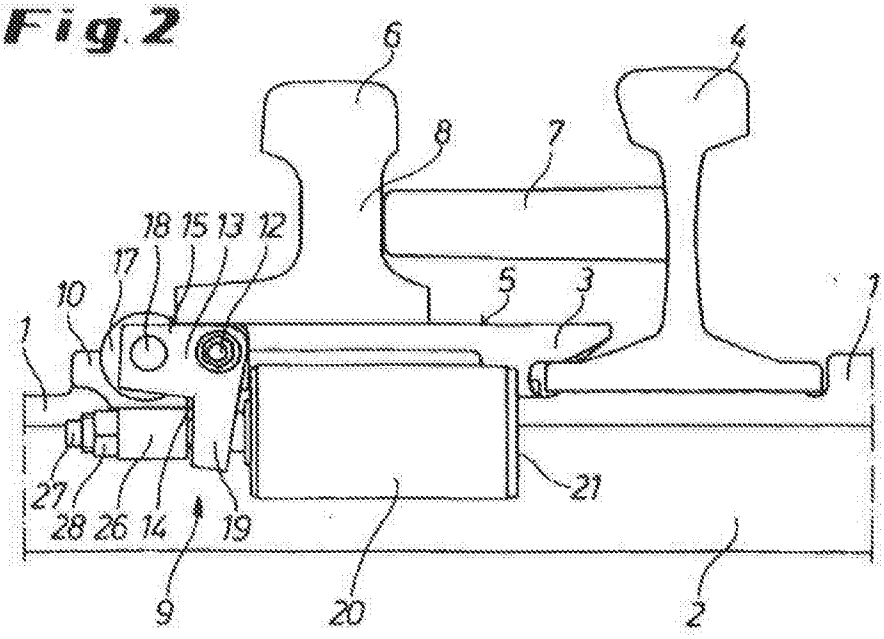

Fig. 3

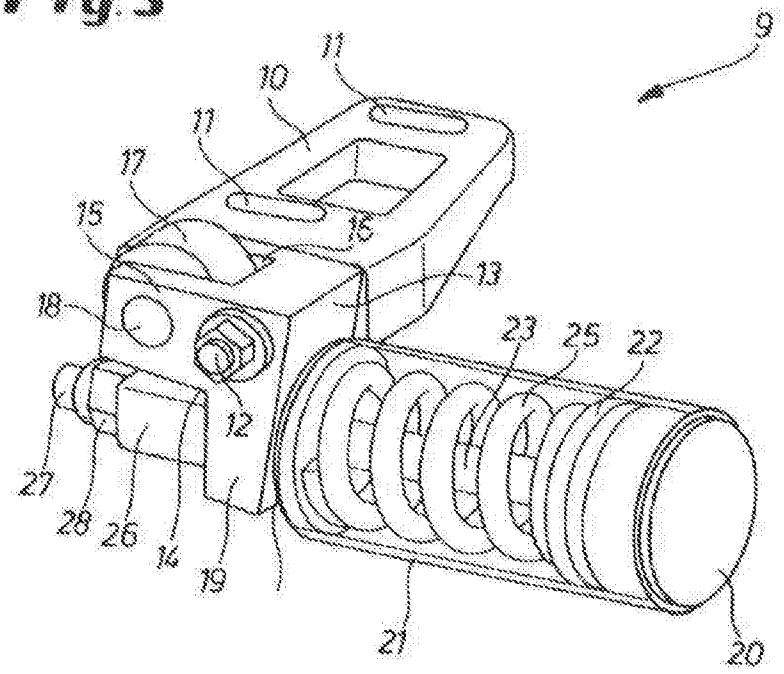
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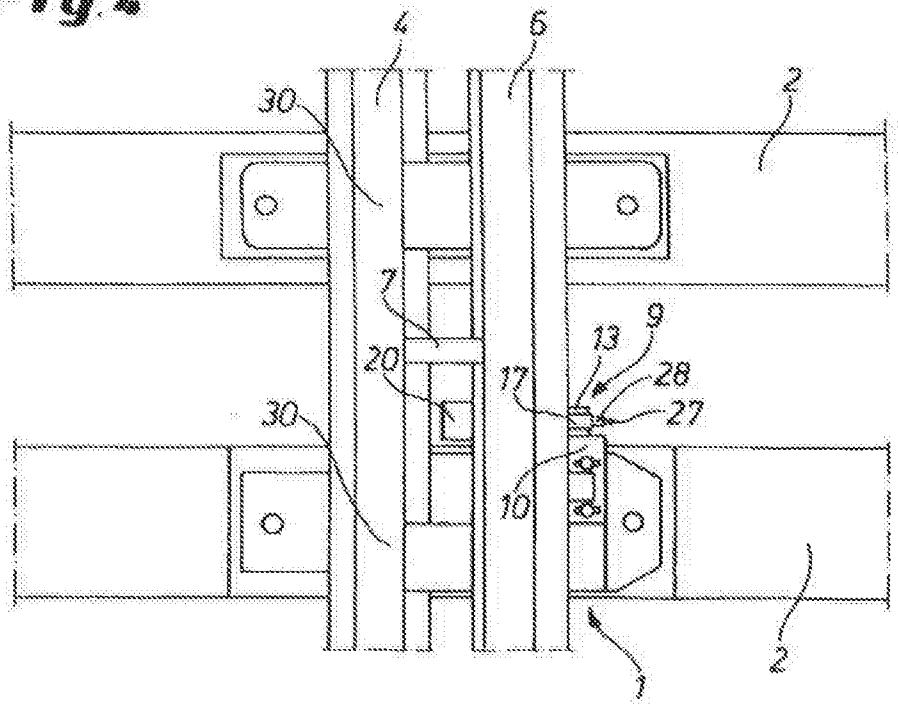
Fig. 4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