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

(11) Publication number: **0 402 093 A2**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **90306089.5**

(51) Int. Cl.[5]: **E01B 9/68**

(22) Date of filing: **05.06.90**

(30) Priority: **09.06.89 AU 4636/89**

(43) Date of publication of application:
12.12.90 Bulletin 90/50

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

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(54) Ribbed elastomeric rail pad.

(57) A rail fastening of the kind in which a rail (7), having a field edge (21) and a gauge edge (22), is fastened to a rail tie (8) with a rail pad (9) between the tie and the rail includes a pair of rail clamp supports (10) secured to the said tie (8) on either side of said rail and abutting said rail pad and a rail clamp (11) associated with each rail clamp support, each clamp (11) having a portion secured in said clamp support and a portion bearing down on the rail flange. The improvement comprises the provision of a rail pad (9) which electrically and dynamically insulates said rail tie (8) from said rail (7) and in which there is a rib (25) provided on the field edge portion of the rail pad.

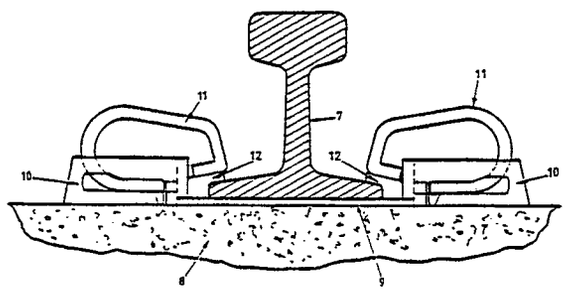
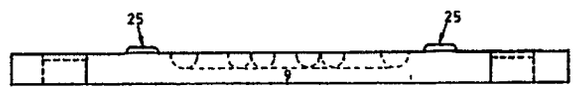


Fig. 1

Fig. 3



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RIBBED ELASTOMERIC RAIL PAD

This invention relates to improvements in rail insulating pads which are used to electrically and dynamically insulate the rail from the rail tie.

Many rail pad constructions have been proposed to provide the necessary insulation and to protect the rail ties from damage and the rail seal from instability. U.K. Patents 2154635 and 2152119 provide pads of relatively hard material which provide, by way of selective removal of material from the pads, good attenuation and rail stability.

However, improved durability of rail pads is a long sought after advantage.

In curved track the rail head is subject to the vertically down gravity forces from the rolling stock and in addition, horizontal centrifugal forces. These combine to impart a rolling tendency to the rail which is resisted by the rail fasteners and the pad beneath the rail.

These forces cause a pressure on the rail pad which is greatest under the field edge of the rail which often causes this edge to cut into the soft rail pad and in some extreme cases, to cut it right through.

The field edge is the outside edge of the rail in a track formed by a pair of rails. The inside edge is referred to as the gauge side of gauge edge of the rail.

It is an object of this invention to provide a rail pad having improved durability.

To this end the present invention provides a rail pad to electrically and dynamically insulate a rail from the rail tie in which the rail pad incorporates an upstanding rib on either or both the upper and lower surface of said pad on the field edge side of said pad.

This invention is a way to reduce the intensity of the pressure under the field edge of the rail thereby prolonging the life of the elastomeric rail pad. This is done by providing a ridge on the field edge of the pad which runs parallel to the length of the rail and is located with the edge a short distance away from the rail edge towards the rail centre. Preferably the ridge may be about 10mm wide with the edge approximately 10mm from the field edge of the rail. The rib is preferably about 1 or 1.5mm high and is preferably of a material which is compressed flat by the load of the rail and in so doing, creates a higher than normal pressure in the region of the rib which then subtracts some of the load from the region of the pad directly underneath the rail edge thereby causing a reduced pressure in this region with the consequent reduction in the tendency for the rail edge to cut the pad. Of course the increased pressure in the proximity of the pad does not create a cutting tendency since there is no edge in this area.

The rib should have a low height, preferably 1 to 1.5mm so that under the load of the installed rail fastening clips it compresses down to the general level of the remainder of the pad thereby ensuring that the rib does not carry the total load and also to ensure that the pad peripheral edges are in contact with the concrete rail seat and rail to ensure an adequate seal to prevent the ingress of damaging abrasive grit particles.

The rib can be placed either on the top side of the pad or on the bottom or alternatively, distributed between both top and bottom. However, the preferred position is on top to minimise the risk of dust entering between the pad and concrete rail face.

Although most situations call. for the rib to be on the field edge of the pad where the function is normally required, in some unusual situations where the track is canted and the traffic travelling around the curve is moving slower than the designed speed for the cant, the rail head can receive a lateral force by the gravity component which exceeds the centrifugal component giving a net force towards the centre of the curve. For this reason the rib is preferably applied to both the field and gauge sides which has the additional benefit of making the pad less susceptible to being installed the incorrect way around.

A preferred embodiment of this invention will now be described with respect to the drawings in which figure 1 is a general schematic view of a rail seat illustrating the position of the rail pad; figure 2 is a plan view of a preferred form of the invention and figure 3 is an edge view of the pad.

Figures 4A and 4B provide a comparison of the standard prior art pads and the pads of this invention.

In figure 1 the rail seat comprises a rail 7, a rail tie 8 and the rail pad 9 interposed between them. The rail is fastened by the rail clips 11 seated in the clip holders 10 embedded in rail tie 8. An insulator 12 lies between the rail 7 and the fastener 11.

In figures 2 and 3 the rail pad 9 comprises field side 21 and gauge side 22 with the edge recesses 23 to fit about the clip holders 10. Grooves 24 are provided in the surface of the pad to improve attenuation. The low ribs 25 are each about 1mm in height and are designed to lie under the rail within 10mm of the field and gauge edges of the rail.

In figure 4A a standard rail pad 30 is shown under a rail 7. The arrows on the rail head indicate the direction of forces imposed on the rail by the passing rail trucks. The arrow 28 on the field side

21 of the rail pad shows deep indentation underload which leads to cutting of the pad along the field edge of the rail. In figure 4B a pad 9 of this invention shows reduced indentation 29 on the field edge due to the provision of ribs 25. There is also less roll by the rail with consequent improved stability.

From the above description, it can be seen that the present invention provides an improved rail pad with enhanced durability.

Claims

1. In a rail fastening of the kind in which a rail, having a field edge and a gauge edge as hereindefined, is fastened to a rail tie by a rail seat consisting of a rail tie, a rail pad between the tie and the rail; a pair of rail clamp supports secured to said tie on either side of said rail and abutting said rail pad; rail clamp associated with each rail clamp support each clamp having a portion secured in said clamp support and a portion bearing down on said rail flange, the improvement comprising the provision of a said rail pad to electrically and dynamically insulate said rail tie from said rail wherein there is a rib provided on either or both upper or lower surface of the field edge portion of the rail pad.

2. The improvement of claim 1 wherein said rib is of sufficient height to effect reduction of a force transmitted to said pad at said field edge of rail.

3. The improvement of claim 1 or claim 2 wherein the rib is parallel to said rail.

4. The improvement in any one of claims 1 to 3 wherein said rib is on the upper surface of said rail pad.

5. The improvement in any one of claims 1 to 4 wherein said rib is about 10 mm from the field edge of the rail.

6. The improvement in any one of claims 1 to 5 wherein said rib is about 10 mm wide and 1.0 to 1.5 mm high.

7. The improvement in any one of claims 1 to 5 wherein an additional rib is provided on the gauge edge portion of the pad.

8. The rail pad as defined in claim 1.

9. The rail pad as defined in claim 7 wherein the rib is parallel to said rail.

10. The rail pad as defined in claim 7 or 8 wherein the rib is about 10 mm from the field edge of the rail.

11. The rail pad as defined in any one of claims 7 to 9 wherein the rib is about 10 mm wide and 1.0 to 1.5 mm high.

12. The rail pad as defined in any one of claims 8 to 11 wherein an additional rib is provided on the gauge edge portion of the pad.

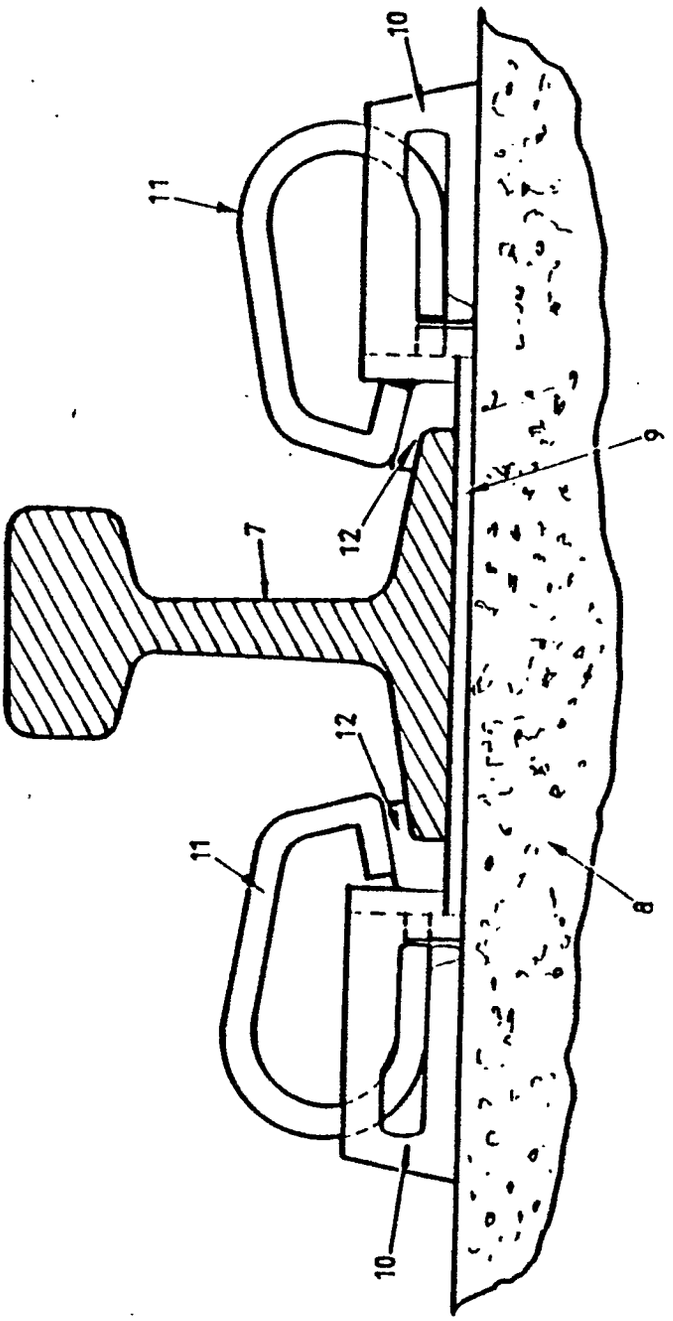

Fig. 1

Fig. 2

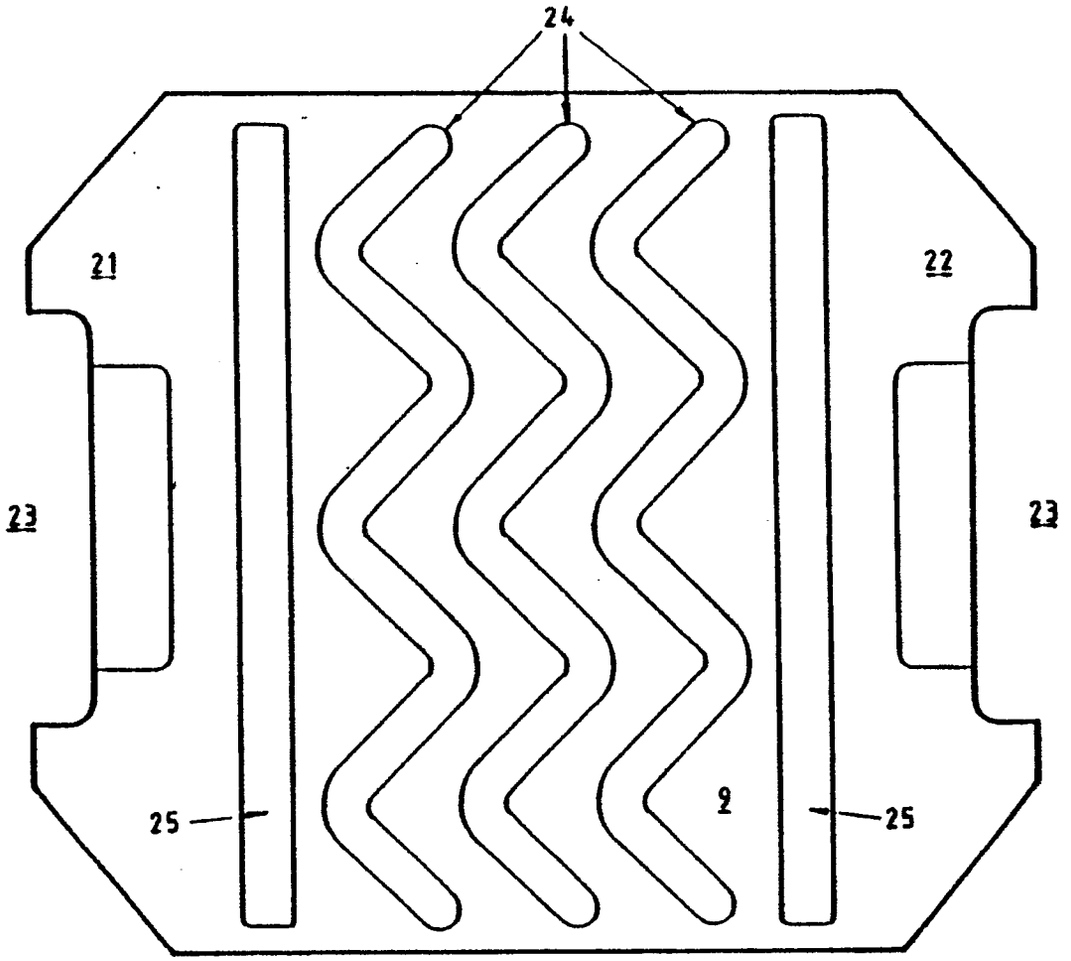

Fig. 3

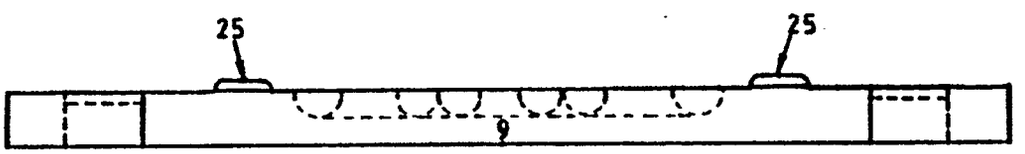

Fig 4a

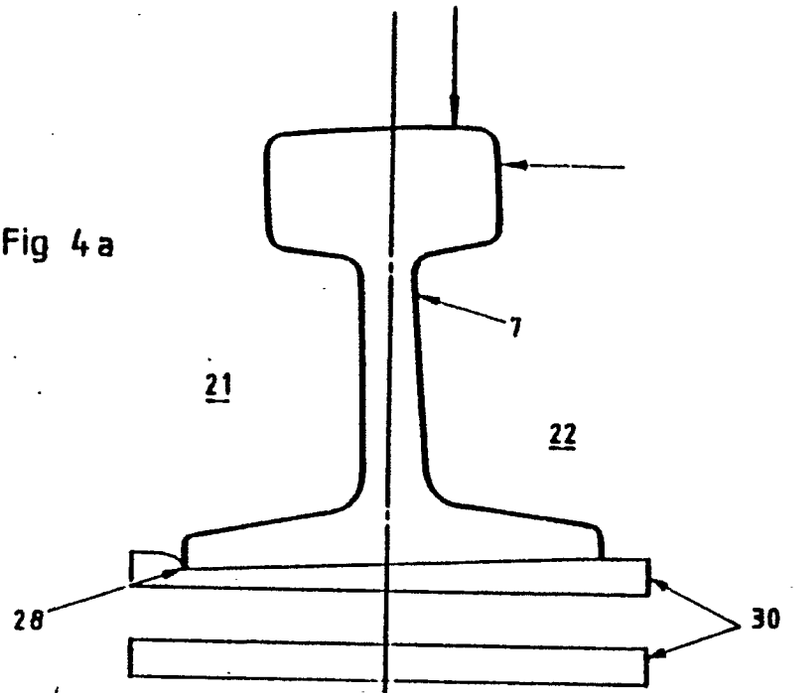

Fig 4b