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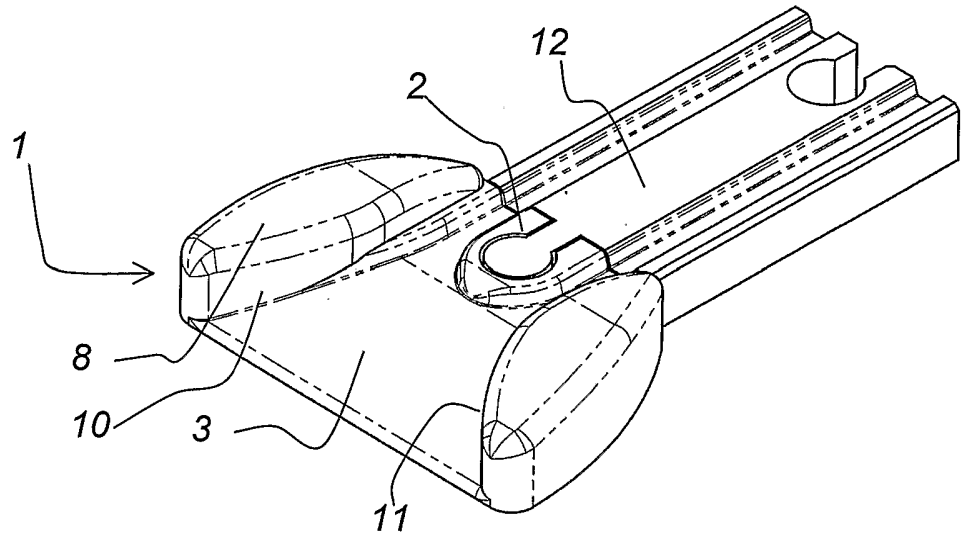
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** RAIL ELEMENT TO A TOY RAILWAY



(57) **Abstract:** The present invention relates to a rail element, which has a connecting means (2) and is adapted to be connected to a second rail element (12) to form a toy railway. The rail element consists of a ramp element (1) having a ramp surface (3) which rises obliquely upwards from the base plane of the rail element, towards the connecting means (2) . The rail element also has first and second border parts (8, 9) with first and second border surfaces (10, 11), which rise from the ramp surface (3) and are oriented towards the same. The distance between the border surfaces (10, 11) decreases towards the con- necting means (2).

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TOY

Field of the Invention

The present invention relates to a rail element, which is adapted to be interconnected to a second rail element to form a toy railway and which comprises a connecting means to render said interconnection possible.

Background Art

Rail elements of the above type are often made of wood and can be used to build toy railways on a floor in the form of closed loops, around which it is possible to run trains with engines and carriages, intended for the purpose. The wheels of the trains then run in, usually milled, grooves in the upper surface of the rail elements. For connecting means use is made of pins and recesses, which are formed to allow the pins to fit into the recesses. The rail elements can be straight and curved.

Such rail elements are suitable for many preschool children, but children under three often do not manage to build closed loops of such rail elements since this requires some preparation and planning in advance when using straight and curved rail elements which are rigid. It may therefore be difficult for young preschool children to use rail elements of the above-mentioned type.

Summary of the Invention

An object of the invention is therefore to provide a rail element of the above-mentioned type, which makes it easy for young preschool children to play with toy railways.

This object is achieved by a rail element according to claim 1.

The rail element then consists of a ramp element with a base plane, said ramp element having a ramp sur-

face which rises obliquely upwards from the base plane towards the connecting means. Moreover the ramp element has first and second border parts, which are located on opposite sides of the ramp surface and comprise first and second border surfaces, respectively, which rise from the ramp surface and are oriented towards the same, the distance between the first and second border surfaces decreasing towards the connecting means.

Such a rail element renders it easy for a small child to play with toy railways since with such a rail element it is no longer necessary to build closed loops of rail elements to allow easy running of the train on a track. The child can then build open, meandering loops and sometimes run the train on the base, a table or a floor, and sometimes on the track. The ramp shape of the rail element and the guiding border surfaces make it easy to run the train from the base and onto the track without the train being derailed or the engine and carriages being disconnected.

The border surfaces can be curved around the normal of the base plane so as to curve in towards the ramp surface. This has been found to provide a suitable guiding effect which reduces the risk of derailing and disconnection.

The ramp surface can, next to the connecting means, form bottom surfaces of a first and a second groove. This results in a smooth transition between ramp surface and grooves.

The border surfaces can, next to the connecting means, be divided into upper and lower partial surfaces, the upper partial surfaces being located at a greater distance from the centre line of the rail element than the lower partial surfaces. This results in a suitable guiding effect while at the same time also the engine and carriages, which have their greatest widths above their wheel level, can easily be run through the rail element.

The ramp surface can be curved around an axis perpendicular to the centre line and parallel to the base plane in such a manner that it curves out from the base plane and next to the connecting means is substantially parallel to the base plane. This makes it possible to avoid sharp angles in the travelling direction of a train.

The rail element can be made in one piece from injection-moulded plastic. Alternatively it can be made of wood.

Brief Description of the Figures

Fig. 1 is a top plan view of a rail element according to an embodiment of the invention.

Fig. 2 is a cross-sectional view along line A-A in Fig. 1.

Fig. 3 is an end view of a rail element.

Fig. 4 is a longitudinal section along line B-B in Fig. 3.

Fig. 5 is a perspective view of a rail element according to an embodiment of an invention, which is connected to a conventional rail element.

Fig. 6 is a top plan view of a male variant of a rail element according to an embodiment of the invention.

Description of a Preferred Embodiment

Fig. 1 is a top plan view of a rail element 1 according to an embodiment of the invention. The rail element 1 is adapted to be interconnected to a second rail element and therefore has a connecting means in the form of a recess 2 which is adapted to cooperate with a pin on the second rail element. Therefore the rail element shown in Fig. 1 can be said to be a female type.

As shown in Fig. 6, the connecting can means instead consist of a pin 2' and the rail element 1' can then be said to be a male type. The rail element 1' in Fig. 6

can, as to the rest, essentially correspond to the one in Fig. 1.

Referring once more to Fig. 1, the rail element 1 here shown consists of a ramp element, which with a base plane is adapted to lie on a floor or a table where the toy railway is to be built. Therefore the rail element has a ramp surface 3, which rises obliquely from the base plane, towards the connecting means 2. Along a centre line 4 on the rail element 1, the distance between the base plane and the ramp surface thus increases substantially continuously from a lower edge 5 of the ramp surface 3 to the area around the recess 2.

When the rail element 1 is connected to other rail elements, which are of a conventional type, to form a track, it is therefore possible to run a train with engine and carriages from the base (floor or table), on which the track is laid out, and onto the track, without the carriages coming loose from the engine or from each other. This is the case even if the carriages and the engine are connected to each other only by relatively weak magnets. The train is then run in a direction of travel which coincides with the centre line 4, from the lower edge 5 and onto the track. Of course, it is also possible to run the train in the opposite direction from the track and down onto the base. The rail element may, but need not, be symmetrical with respect to the centre line 4. The centre line intersects the centre of the connecting means 2, perpendicular to the end face where the rail element is adapted to be connected.

The ramp surface 3 can at its lower edge 5 reach down all the way to the base plane and thus to the base. However, there may be arranged a terminal edge which is substantially perpendicular to the base plane and projects 1-2 mm from the base plane. This may be advantageous since the lower edge 5 will then be less sharp. Engine and carriage wheels usually have such diameters that the step at the terminal edge does not cause a prob-

lem. The wheels will unimpededly climb over the step. The rail element 1 may comprise grooves 6, 7 at the upper end of the ramp surface 3 (adjacent to the recess 2). The bottoms of the grooves 6, 7 may coincide with the ramp surface 3.

For the purpose of additionally facilitating the child's playing with the train, the rail element 1 has a first border part 8 and a second border part 9, which are located on opposite sides of the ramp surface 3, for instance as illustrated symmetrically relative to the centre line 4. The first border part 8 has a first border surface 10. The second border part 9 has a second border surface 11. The first and second border surfaces 10, 11 project from the ramp surface 3 and are oriented inwards to the same. They may, but need not, be perpendicular to the base plane. The distance (perpendicular to the centre line 4) between the first and second border surfaces 10, 11 decreases essentially continuously towards the connecting means 2. This provides a funnel effect, which directs the train to the grooves and helps the playing child to avoid derailing. The width of the lower edge 5 of the ramp surface 3 thus is significantly greater than the width of the grooves 6, 7.

It has been found advantageous to let the border surfaces 10, 11 be curved around an axis vertical to the base plane (normal of the base plane) in such a manner that they curve in towards the ramp surface 3. This provides a smooth transition to the guiding of the grooves 6, 7, which means that derailing and disconnection of the train can be prevented. The height of the border surfaces 10, 11 above the ramp surface 3 can, along the entire ramp surface, exceed the depth of the grooves 6, 7. This results in reliable guiding.

The border surfaces 10, 11 can next to the recess 2 be divided into upper 10', 11' and lower 10", 11" partial surfaces. The upper partial surfaces are then positioned

at a greater distance from the centre line 4 than the lower partial surfaces.

Fig. 2 is a cross-sectional view along line A-A in Fig. 1. It is evident that the lower partial surfaces 10", 11" form the outer walls of the grooves 6, 7. The bottom surfaces of the grooves 6, 7 form with their lower 10", 11" and upper 10', 11' partial surfaces, respectively, a stepped shape in cross-section. The greater distance of the upper partial surfaces 10', 11' from the centre line 4 makes it possible for engine and carriages, which have their greatest widths above the wheel level, to be run through the rail element.

Fig. 3 is an end view of a rail element, seen in the travelling direction of the train when running from the base and onto the track. As will be seen, the profile of the grooves 6, 7 at the end surface of the connecting means 2 may correspond to that of a conventional rail element. However, it is possible to exclude, at this end, the inner walls of the grooves and thus let the grooves 6, 7 have a common bottom surface. The rail element base plane, which is adapted to lie on the base, is designated b in Fig. 3.

Fig. 4 is a longitudinal section along line B-B in Fig. 3. The section is taken through a groove 6 of the rail element 1. As shown, the ramp surface 3 can be curved about an axis which is perpendicular to the centre line 4 in such a manner that the ramp surface curves upwards relative to the base plane. As a result, the ramp surface can adjacent to the connecting means 2 be substantially parallel to the base plane, so that the transition to a connected conventional rail element will be smooth and the risk of disconnection will be minimised.

Fig. 5 is a perspective view of a rail element 1 according to an embodiment of the invention, which is connected to a conventional rail element 12. The rail element 1 can be made in one piece from injection-moulded plastic, for instance ABS plastic. Alternatively the rail

element can be made of wood, for instance beech wood. The shape shown above can then be milled from a massive piece of wood with a flat bottom surface.

The invention is not limited to the shown embodiment and may be varied within the scope of the appended claims.

CLAIMS

1. A rail element, which is adapted to be interconnected to a second rail element to form a toy railway and which comprises a connecting means (2; 2') to render said interconnection possible, c h a r a c t e r i s e d in that it consists of a ramp element (1) with a base plane, said ramp element having a ramp surface (3) which rises obliquely upwards from the base plane towards the connecting means (2; 2'), first and second border parts (8, 9), which are located on opposite sides of the ramp surface (3) and comprise first and second border surfaces (10, 11), respectively, which rise from the ramp surface (3) and are oriented towards the same, the distance between the first and second border surfaces (10, 11) decreasing towards the connecting means (2; 2').

2. A rail element as claimed in claim 1, in which the border surfaces (10, 11) are curved around the normal of the base plane so as to curve in towards the ramp surface.

3. A rail element as claimed in claim 1 or 2, in which the ramp surface (3) next to the connecting means (2) forms bottom surfaces of a first and a second groove (6, 7).

4. A rail element as claimed in any one of the preceding claims, in which the border surfaces (10, 11) next to the connecting means are divided into upper partial surfaces (10', 11') and lower partial surfaces (10", 11"), the upper partial surfaces (10', 11') being located at a greater distance from the centre line (4) of the rail element than the lower partial surfaces (10", 11").

5. A rail element as claimed in any one of the preceding claims, in which the ramp surface (3) is curved around an axis perpendicular to the centre line (4) and parallel to the base plane in such a manner that it

curves out from the base plane and next to the connecting means (2) is substantially parallel to the base plane.

6. A rail element as claimed in any one of the preceding claims, which is made in one piece from injection-moulded plastic.

7. A rail element as claimed in any one of claims 1-5, which is made of wood.

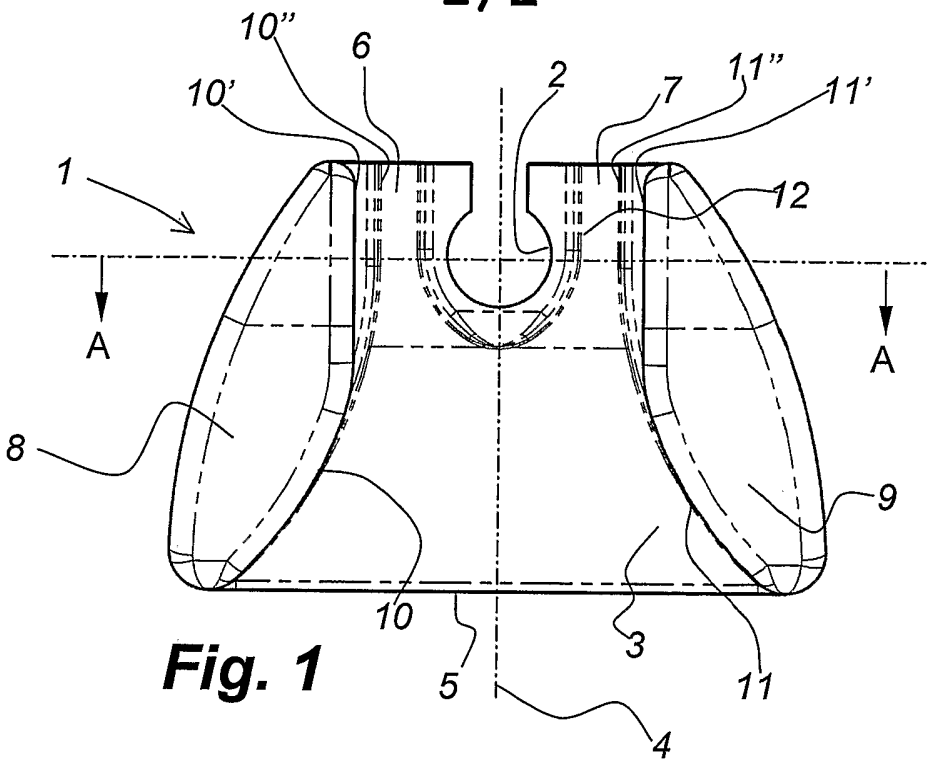


Fig. 1

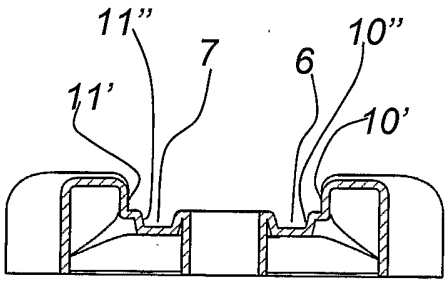


Fig. 2 A-A

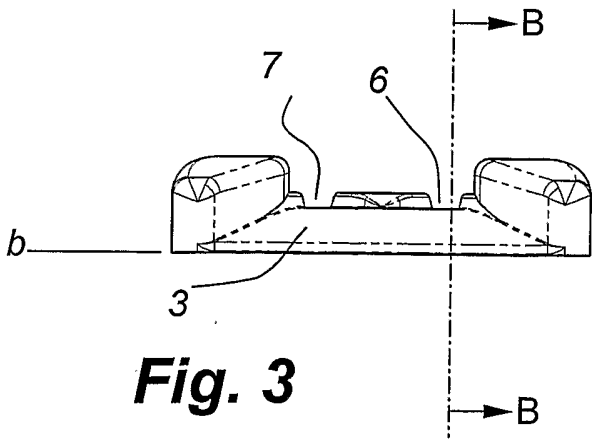
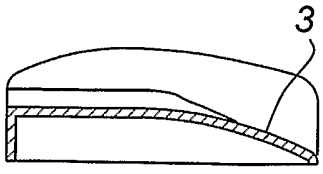


Fig. 3



B-B

Fig. 4

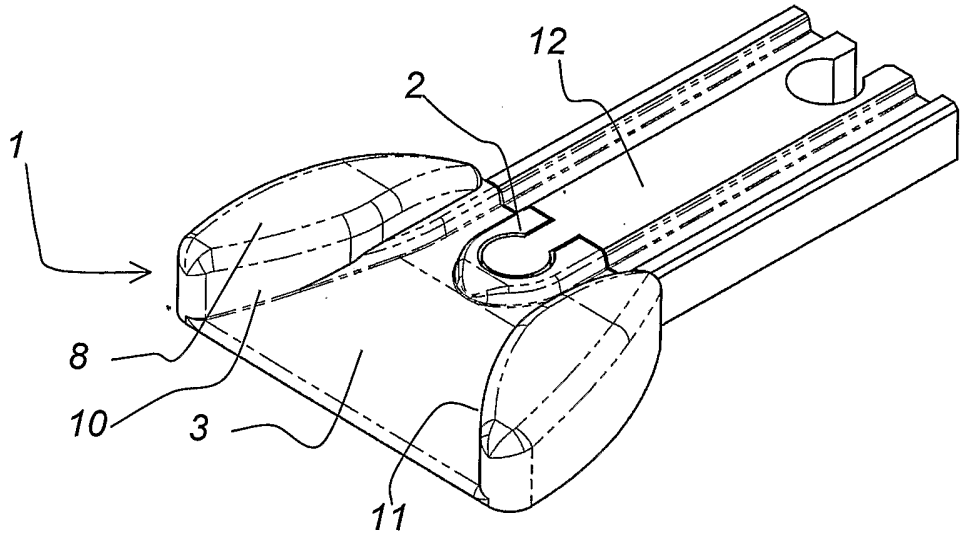


Fig. 5

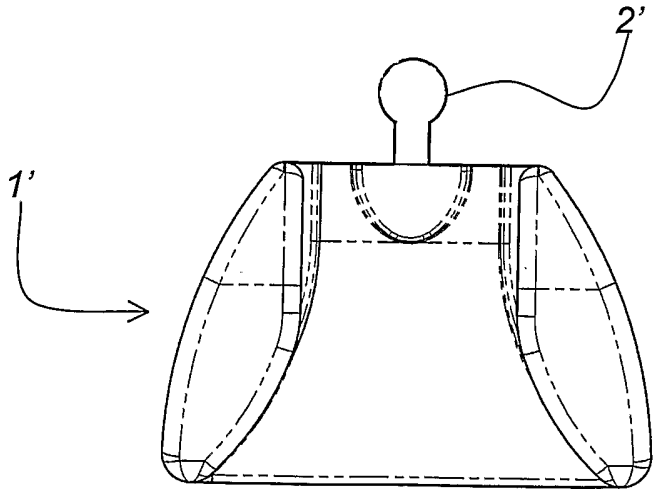


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 2005/001687

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A61H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0097731 A1 (MIURA, FUKUSHIRO), 11 January 1984 (11.01.1984)	1-7
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A	GB 684133 A (GEBR. MÄRKLIN & CIE GMBH), 10 December 1952 (10.12.1952)	1-7
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A	US 2530895 A (RALPH V MELIOR), 21 November 1950 (21.11.1950)	1-7
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☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"P" document published prior to the international filing date but later than the priority date claimed
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"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
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Date of the actual completion of the international search	Date of mailing of the international search report
14 February 2006	15 -02- 2006
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Christer Jönsson/EK Telephone No. +46 8 782 25 00

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A63H 19/30 (2006.01)

EP	0097731	A1	11/01/1984	DE	3273734 D	00/00/0000
GB	684133	A	10/12/1952	NONE		
US	2530895	A	21/11/1950	NONE		