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54 Chair for attaching railroad rails and a method of manufacturing a chair.

57 The invention provides a chair for railroad rails. The tie-plate (1) is partly enveloped in synthetic resin (4). By a special construction of the chair (no sharp edges) and injection moulding it has proved possible to obtain a sufficiently strong envelope of synthetic resin (4). The envelope (4) is made of a glass-fibre-reinforced polyester injection-moulding material.

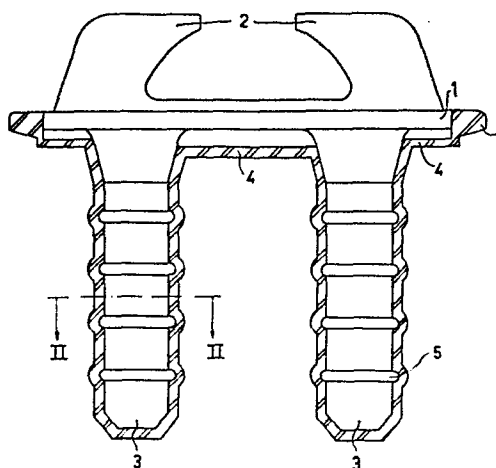


FIG.1

Chair for attaching railroad rails and a method of manufacturing a chair.

The invention relates to a chair for attaching a railroad rail to a sleeper, comprising a sole plate with clips on one side for holding the rail and with one or more members projecting from the other side to be embedded in the sleeper, said member or members and said other side of the sole plate being encased in an electrically non-conductive envelope. The invention also relates to a method of manufacturing a chair for the attachment of a railroad rail.

Railroad rails are attached to sleepers by means of chairs. Nowadays various control signals are transmitted through the rails for guiding trains, for indicating the positions of trains on the rails and the like. Transmitting control signals through the rails is possible only if the rails are insulated electrically with respect to earth. Because of the large forces which are exerted on the rails and on the chairs, the latter are manufactured from metal. Therefore the chairs are electrically conductive in themselves. Moreover, the chairs are in contact with the sleepers and hence with earth. To overcome this problem, chairs are used which are partly encased in an electrically non-conductive envelope of synthetic resin. This envelope must be sufficiently strong to be able to withstand the forces which are exerted on the chair. An envelope generally used consists of a glass-fibre re-inforced polyester material. The envelope is cast around the relevant parts of the chair by means of a solvent casting process. The known chair has members which are to be enveloped and which are angular in cross-section. A casting material and a solvent casting process have been chosen so as not to damage the glass fibres during the formation of the en-

velope. Damage to the glass fibres leads to reduction in the strength of the envelope.

Solvent casting processes have the disadvantage of being time-consuming and being less suitable from a point of view of environmental pollution due to the use of solvents.

The invention is based on the discovery that a sufficiently strong envelope can also be obtained by a varied geometry of the chair in combination with injection moulding.

The chair according to the invention is characterized in that the cross-section of said member or each of said members (3) in a direction transverse to the direction in which the member projects from the sole plate has a curved circumference and the envelope is made of a glass-fibre-reinforced polyester injection-moulding material.

The method according to the invention is characterized in that the member or members (3) projecting from the sole plate and the side of this plate from which said member or member projects or project are arranged in an injection mould and a glass-fibre-reinforced polyester envelope is injection moulded around said member or members (3) and on the side of the sole plate (1) from which the member or members (3) projects or project.

It has proved possible to obtain a sufficiently strong envelope by means of injection moulding if the aforesaid cross-section of the projecting member or each of the projecting members has a curved circumference so that the member has no sharp edges. Injection moulding is to be understood herein to mean a method in which the injection moulding material is injected at a pressure of 200 kg or more per cm^2 .

The or each projecting member preferably has circumferential ridges.

A particularly practical construction of the

method in accordance with the invention is characterized in that the sole plate of the tie-plate is used as a boundary surface of the mould.

The invention will now be described in greater detail by way of example, with reference to a drawing, in which

Fig. 1 is an elevation of a chair according to the invention with the envelope shown in section,

Fig. 2a is a cross-sectional view taken on the line II - II of Fig. 1, and

Figs. 2b and 2c show two further possibilities for this cross-section.

The chair shown in Fig. 1 comprises a sole plate (1), on one side of which are formed two clips (2) for holding a railroad rail. The rail, which is not shown in the drawing, is clamped between the clips (2). Elongate members (3) project from the other side of the plate (1). These members are embedded in a sleeper, not shown, to attach the chair to the sleeper. For a more secure attachment the members (3), as shown in the drawing, may comprise circumferential ridges (5). The sleeper may be manufactured from concrete. The members (3) can be moulded into the concrete during the manufacture of the sleeper. Alternatively, they may be inserted afterwards in holes which are provided in the sleepers.

The sole plate (1), clips (2) and members (3) are usually manufactured from metal, for example by casting or forging or combinations thereof.

Fig. 2a shows the transverse of a member (3). Figs. 2b and 2c show, by way of example, other possible transverse cross-sections of the members (3). According to the invention it is essential for the transverse cross-section of each of the members (3) to have a curved circumference so that the members have no sharp edges.

Reference numeral (4) in Fig. 1 and Figs. 2a, 2b and 2c denotes an injection-moulded envelope of a

glass-fibre-reinforced polyester resin. The envelope may have a thickness of from 0.5 to 10 mm; a thickness of 3 mm gives good results. In addition to the polyester resin and the glass fibres, the envelope usually comprises fillers, dyes, hardener and catalyst.

Fig. 1 shows a chair having two members (3). Other constructions are also possible in which, for example, a single U-shaped member is used; such a member may be considered as being constituted by two members similar to the two members (3) shown in Fig. 1, interconnected by a cross-piece.

When moulding the envelope the moulding material can best be injected at the ends of the members (3).

In a particularly simple example of the method in accordance with the invention, an injection mould is used in which the two members (3) fit with a small clearance (corresponding to the desired thickness of the envelope). This mould is sealed at one end by the sole plate (1), which is pressed against the mould by means of a clamp. The injection-moulding material is injected into the mould via an aperture. This aperture is preferably located near the free ends of the members (3), i.e., the ends remote from the sole plate (1).

CLAIMS

1. A chair for attaching a railroad rail to a sleeper, comprising a sole plate (1) with clips (2) on one side for holding the rail and with one or more members (3) projecting from the other side to be embedded in the sleeper, said member or members (3) and said other side of the sole plate (1) being encased in an electrically non-conductive envelope (4) of synthetic resin, characterized in that the cross-section of said member or each of said members (3) in a direction transverse to the direction in which the member projects from the sole plate has a curved circumference and the envelope is made of a glass-fibre-reinforced polyester injection-moulding material.
2. A chair as claimed in Claim 1, characterized in that members (3) comprise circumferential ridges (5).
3. A method of manufacturing a chair as claimed in Claim 1, characterized in that the member or members (3) projecting from the sole plate and the side of this plate from which said member or members projects or project are arranged in an injection mould and a glass-fibre-reinforced polyester envelope is injection moulded around said member or members (3) and on the side of the sole plate (1) from which the member or members (3) projects or project.
4. A method as claimed in Claim 3, characterized in that sole plate (1) is used as a boundary surface of the mould.

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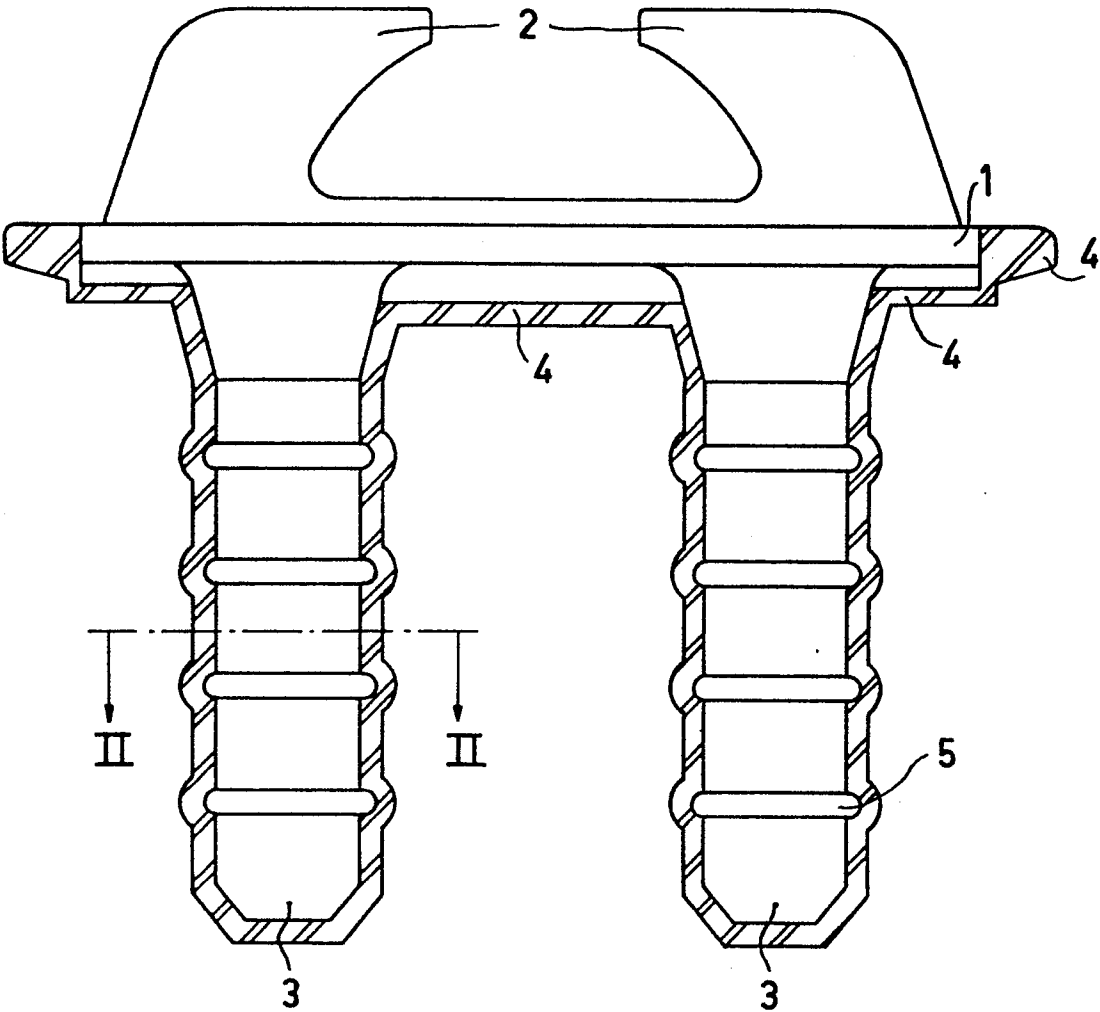


FIG. 1

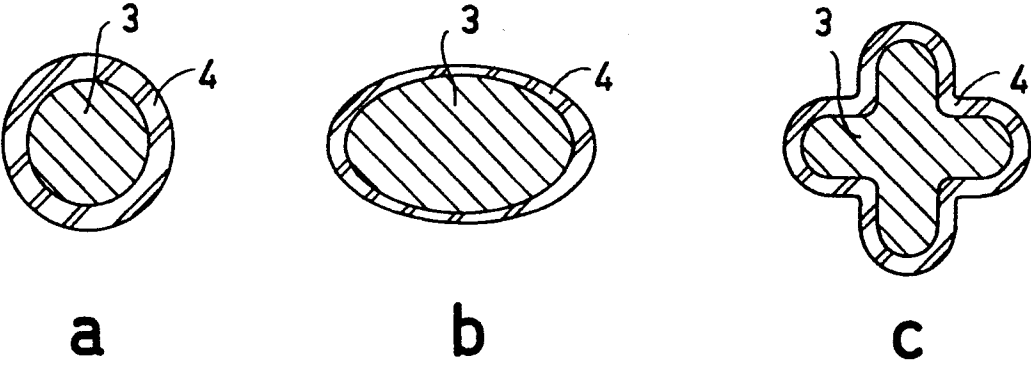


FIG. 2



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
A	GB-A- 961 876 (TIPPETT) * Page 2, lines 60-67, 117-128; page 3, lines 7-10, 83-90; figures 1,2 *	1,2	E 01 B 9/18
A	GB-A- 865 120 (TIPPETT) * Page 3, lines 53-55, 112-118; figure 4 *	1,2	
A	FR-A-2 315 568 (VANOTTI) * Page 1, lines 20-24; page 2, lines 25-34; page 4, lines 5-12; figures 1,2 *	1,2	
A	FR-A-1 296 107 (QUERNE) * Page 1, left-hand column, last paragraph; page 1, right-hand column, paragraph 1; page 2, left-hand column, paragraph 4; page 2, right-hand column, paragraphs 4,5 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl. 3) E 01 B
A	FR-A-1 108 300 (EVERTS)		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24-08-1983	Examiner RUYMBEKE L.G.M.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			