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(54) Track for toy vehicle running tracks with longitudinal connection and vertical stiffening.

(57) A track in the form of a running track for model electric cars, comprised segments in which there is provided at each end, in a substantially central position, at least one flat tongue (9) divided axially into two parts, in order to form two toothed members (9a, 9b) projecting lengthwise from such ends and capable of adapting flexibly in a transverse sense, and a prismatic cavity (8) with a lateral profile matching that of such tongue (9), there being furthermore provided a flat tongue (11) having a cam or step (11b) and a cavity of matching profile (12a) located within a box-shaped body (12) forming a line of contact between each pair of segments in the form of a broken line diagonally inclined in such a way as to improve the rigidity of the joint and prevent deformation in the vertical sense of the said segments relative to such line of contact.

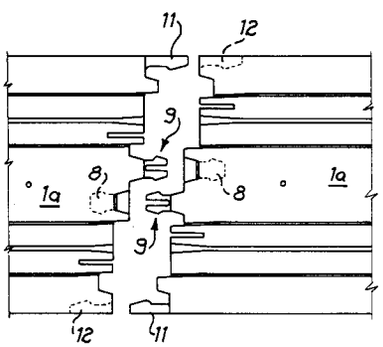

Fig.5

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The object of this invention is a track or running track consisting of various segments capable of being assembled in a coplanar manner by longitudinal connection, being particularly suitable for model electric vehicles and capable of being used on supporting surfaces.

As is well known to model electric car and train enthusiasts, there have long been available many types of electric tracks for running various models of cars, trains and the like which are intended not only as a plaything for youngsters and children but also as an agreeable way of staging competitions or races, even by adults.

As is known, the tracks or running tracks consist of a number of segments or flat pieces alike to one another which can be assembled flat by end-to-end insertion using various types of detachable links, each track being furthermore provided with one or more longitudinal grooves capable of accommodating in a sliding manner and guiding a pin projecting from the underside of the vehicle and, laterally and parallel to these, two other grooves each containing in a stable manner an electrical conductor to power the motor of the vehicle, such power supply normally being taken up by the wheels of the vehicle or by brushes attached to the motor and sliding on such electrical conductors.

The longitudinal and coplanar connection of several segments makes it possible to form running tracks of widely varying sizes and with a closed-loop circuit in which, following assembly, both the vehicle guiding groove and the two lateral electrical conductors have their ends respectively coincident and electrically connected. Furthermore, all the segments are provided with longitudinally projecting means of coupling located in staggered positions at the opposite ends of the individual segments so that the said segments can be easily interchanged, thus facilitating the operations and reducing the time needed to assemble the complete track.

The means of coupling by insertion are comprised in certain cases of tongues coplanar to the plane of the segment and projecting longitudinally outward from one end of the said segment, on each of which is provided a tooth or pin capable of engaging and being retained, following assembly, in a corresponding recess or through-hole provided at the end of the flat wall of the adjoining segment.

Each segment is provided at both ends with at least one tongue and at least one recess or hole, staggered in relation to one another but in reverse position, so that each end of one segment can be inserted into one end of another segment.

Furthermore, in order to ensure a stable attachment, at the opposite ends of each segment provision is made for a tongue or projection, usually of trapezoidal or like shape, located on one side of the segment and a matching recess on the other side of the same segment.

In other cases the segments are provided with recessed plates differing in height from segment to segment and capable of being overlapped then secured with diverse means such as screws or the like.

In practice it is readily apparent that the segments capable of being longitudinally attached to one another by insertion display certain disadvantages, including the need for considerable force and a certain amount of practical experience to insert and remove the fixing members, so that assembly proves difficult particularly if carried out by youngsters and children. Such force, coupled with rigid links which are not suitably guided, can easily result in breakage of the actual links, in addition to which such segments of known type do not impart sufficient rigidity to the assembled track, particularly in the direction of the vertical axis; in fact, the joint between a vertical tooth and a tongue engaged with a hole, formed in the upper plane of the segment, only exerts secure and rigid anchoring of the interconnected segments in the longitudinal direction but not in the vertical direction, since both segments can rise partially or become arched relative to one another. especially when the track is not positioned on a fully flat support.

This possibility of bending in the vertical direction, which is brought about also by the fact that the junction line of the segments is at right angles to their longitudinal axis, can furthermore cause damage and defects between the contact surfaces at the ends of the electrical conductors of the linked segments.

There is therefore posed the technical problem of developing a track or running track for model electric vehicles, consisting of segments capable of being assembled lengthwise, which is able to overcome such disadvantages presented by running tracks of known type and above all is able to achieve improved rigidity in any direction, following assembly of the various segments.

In connection with this problem, one aim of the invention is to develop a single or double track of the type having flat segments or pieces which are not capable of being joined axially, structured in such a way as to prove easy and quick to assemble and dismantle and to impart rigidity and stability even on supports which are not completely flat.

Another aim of the invention is to develop a track of the type specified above which is structured in such a way as to ensure perfect and stable linking of the line of transverse contact of the different segments attached to one another, perfect continuity of the electric power supply to the vehicle in the end zones of the coupled segments, and such as to have at the ends of each assem-

blable section projecting components which do not have sharp edges or points likely to cause harm to the person, nearly always a child, engaged in assembling and dismantling the track.

These and yet other aims, which will become more clearly apparent from the following description, are achieved by a track or running track for model electric vehicles of the type having a number of segments consisting of units of slablike section capable of being assembled in a longitudinal and coplanar manner by insertion of the projecting members and recesses provided at one end of each segment, respectively into matching recesses and projecting members provided at the other end of each segment, such track being furthermore provided with grooves for guiding the vehicles and for accommodating the electrical conductors intended to supply power to the motors of such vehicles, which track is comprised, according to this invention, of a number of slablike segments, substantially rectangular, having a flat surface made integral with walls and with quadrangular box-shaped supporting bodies, located at least at the opposite ends of each segment, and between which are provided at least one longitudinal groove to guide the vehicles and, for each of these, a further two grooves lateral and parallel thereto to accommodate electrical conductors, each of such segments having at each of its ends, in a position substantially central and at right angles thereto, a flat tongue of plain section divided into two halves in order to form two components, laterally indented and flexibly adaptable and, within an adjoining box-shaped body, a prismatic cavity of lateral section matching that of such tongue, capable of receiving by insertion and retaining laterally an appropriate tongue projecting from another segment, there being furthermore provided, on the outermost side of each segment, a flat tongue with a step or cam on the inner side capable of being inserted into a cavity of matching shape, suitably provided in another segment, such central tongues and such lateral tongues with cam located at either end of the segments being positioned relative to the ends of cavities of matching shape located at each end of the said segment, at different longitudinal distances so as to create a line of contact for each pair of segments in the form of a broken line inclined diagonally to the transverse axis which, together with the particular configuration of the coupling used, is capable of improving the rigidity of the joint in a transverse sense and preventing curvature in the vertical sense of the said segments in relation to such line of contact.

More particularly, such central tongues and such lateral tongues have a peripheral profile with edges and corners rounded to safeguard against knocks when inserting the tongues into the cavity of the box-shaped body. Furthermore, at least one of the opposite ends of the groves guiding the vehicles and accommodating the electrical conductors of each segment is at least partly flared to facilitate sliding of the vehicle guide pins and insertion and positioning of part of the ends of the electrical conductors of a segment in stable lateral contact with those of the other segment.

Further features and advantages of this invention will become more clearly apparent from the following detailed description of one of its forms of implementation, with reference to the attached drawings, given only as a guide, which show:

- In figure 1 : a plan view of a segment of track or running track made according to the invention and capable of being joined in a detachable manner by insertion in a longitudinal sense to other like segments;
- In figure 2 : the same segment of figure 1 shown in partial bottom view in longitudinal section according to a horizontal plane;
- In figure 3 : a front view, at the attachment side, of the segment of figure 1;
- In figure 4 : a cross-sectional view according to plotting plane IV-IV of figure 2;
- In figure 5 : a partial plan view of two segments according to the invention, in course of axial connection, and
- In figure 6 : the part of the segment of the previous figures shown in perspective.

With reference to the above-mentioned figures, the track in the form of a running track for model electric vehicles made according to the invention consists of a number of segments or pieces of flat profile made of plastic or like material, obtained by press-forming, injection-moulding or the like, each of which is capable of being coupled by insertion in an axial and coplanar manner to other like segments in order to form tracks of various lengths and configurations; in the latter case some segments are made in the form of a bend of suitable radius. Each segment, generally marked 1 in the figures, consists of a slablike body 1a with a flat surface, of rectangular or curved shape, having two opposite longitudinal, vertical sides, 1b and 1c which impart to the segment the form of a box-shaped body of open bottom, capable of being laid on a supporting surface. Outwardly from such vertical sides there projects vertically a further edge 1d folded down to form a vertical tab 1e capable of accommodating, upon being attached by insertion, a section constituting the guardrail of the track.

Transversally to the longitudinal axis of segment 1 there are provided vertical walls 2,2a having a stiffening function. In upper horizontal flat wall 1a are provided two parallel grooves 3 and 3a, acting as slideways for the pin projecting from the underside of the vehicles, and laterally to each of these are provided another two pairs of longitudinal grooves, respectively marked 4,4a and 4b,4c, in which are fixed in a stable manner a metal strip or plate 5,5a and 6,6a; such strips constitute the usual electrical conductors for powering the motors of the vehicles guided within grooves 3 and 3a.

At the opposite ends of segment 1 are provided, in a staggered position relative to the axis of the said segment, two substantially box-shaped bodies 7 of like quadrangular form, open at the front, the internal cavity 8 of which is shaped in the form of a trapezium or a triangle so as to display two opposite notches or cams 8a, positioned on the opposite vertical inside walls of body 7 and intended to accommodate in a stable manner a flat tongue 9 of appropriate trapezoidal or triangular shape projecting lengthwise from the front end of another segment.

Each tongue is divided, by means of a longitudinal cut 10, into two parts provided with two flat teeth or cams 9a and 9b set against one another in a coplanar position relative to surface 1a of the segment.

Such cut 10 enables the two toothed parts 9a,9b to be brought close together, making use of the flexibility of their constituent material, on being forced longitudinally into the relevant cavities 8 of another segment and then, on being finally inserted, to be separated so as to engage in a stable manner the teeth or cams 9a,9b of tongue 9 in the notches of matching profile 8a of such cavity 8, thus providing a stable joint but one which can also be easily undone by pulling one segment in an axial direction relative to the other.

Moreover, each segment 1 has at each end a flat tongue 11 which protrudes along one outer longitudinal side of the segment and has an outer side 11a of rectilinear shape and an inner side 11b shaped as a cam or the like; such cam-type tongues are capable of being inserted in prismatic cavities 12 of profile 12a matching that of inner side 11b of such outer tongues 11, so that after joining two segments the stability of the joint is assured by the mutual engagement of cams 11b of tongues 11 of one segment with cams 12a of lateral cavities 12 of another segment.

As shown in figures 1, 2 and 6, the ends of projecting tongues 11 and 9 are not located on a line at right angles to the longitudinal axis of the segment, and the same applies to cavities 7 and 12 which accommodate such tongues. This makes it possible, after joining several segments, to achieve a line of contact not located at right angles to the longitudinal axis of the segments, but rather broken and arranged diagonally in relation to the said axis, with obvious advantages in regard to the rigidity of the joint and less likelihood of deformation towards the top and/or towards the bottom of the various segments relative to the joining line.

Still according to the invention, grooves 3 and 3a which guide the vehicles have their ends flared, as shown at 3b in the figures, so as not to create obstacles in the grooves of each segment on being linked to those of the other segments; in this way also, the ends of grooves 4,4a and 4b,4c of for the electrical conductors have an initial lateral length 4e (fig. 2) initially opened out to facilitate the insertion of the ends of one electrical conductor, partly projecting from one segment, into the grooves of another segment so as to achieve secure contact by lateral overlapping of such conductors.

Lastly, each segment or piece 1 has longitudinally two vertical walls or ribs 13 (fig. 4) located in a central position equidistant from the longitudinal median axis of the said segment, and through-holes 14 (figures 1,2,4) capable of bringing about stable attachment of the track to a supporting surface. From the foregoing it is clear that to the invention in question there may be applied modifications and alternatives in regard to the materials used, the colouring and the number of guides for the vehicles and the relevant electrical conductors, without departing from the scope of protection of the said invention.

Claims

1. A track in the form of a running track for model electric vehicles, of the type comprising a number of slablike segments (1) capable of being joined together in a longitudinal and coplanar manner and provided with at least one longitudinal groove (3) for guiding the vehicles and, parallel thereto, at least two grooves (4,4a) incorporating an electrical conductor (5) to power such electric vehicles, characterized in that such slablike segments (1) are substantially rectangular, having a flat surface (1a) integral with vertical walls (1b,1c) and quadrangular box-shaped supporting bodies (7,12), each of such segments being provided at each of its ends, in a substantially central position, with at least one flat tongue (9) of substantially triangular section, divided axially into two parts in order to constitute two toothed components (9a,9b) projecting lengthwise from such end and being flexibly adaptable in a transverse sense and, inside an adjoining box-shaped body (7), a prismatic cavity (8) of lateral profile matching that of such

tongue (9), capable of accommodating by insertion and retaining laterally a matching tongue (9) projecting from another segment (1), being furthermore provided, at the ends opposite each outer longitudinal side of each segment, with a flat tongue (11) provided with a step or cam (11b) on the inner side (11a) and a cavity of matching profile (12a) located in a box-shaped body (12), such central tongues (9) and such lateral tongues (11) being positioned, in relation to the appropriate cavities of matching profile (9a,12a), at different longitudinal distances relative to the said ends so as to create a line of contact between each pair of segments in the form of a broken line diagonally inclined so as to improve the rigidity of the joint and prevent deformation in a vertical sense of the said segments in relation to such line of contact.

2. A track according to claim 1 characterized in that such central tongues (9) and such lateral tongues (11) with cams have profiles with edges and corners rounded to safeguard against knocks during joining of the segments.

3. A track according to claim 1 characterized in that the ends of such guiding grooves (3, 3a) and of such retaining grooves (4,4a,4b,4c) for the electrical conductors (5) of each segment are made at least partly flared or capable of being flexibly opened out to ensure perfect alignment of the guide channels and secure electrical contact between the metal conductors of segments linked longitudinally to one another.

4. A track according to the previous claims characterized in that each flat segment has longitudinally lateral (1a,1b) and central (13) walls or ribs equal in height to those of such box-shaped bodies (7,12), capable of stiffening the said segment and creating zones of support coplanar to one another and parallel to the vehicle running surface.

5. A track according to the previous claims characterized in that it has one or more holes (14) to secure the segment to a fixed supporting surface by means of screws or the like.

6. A track according to claim 1 characterized in that its edges are extended outward and folded down to form tabs (1c) and edges (1d) capable of retaining in position the guardrail of the track provided with appropriate attachment seats.

Fig.1

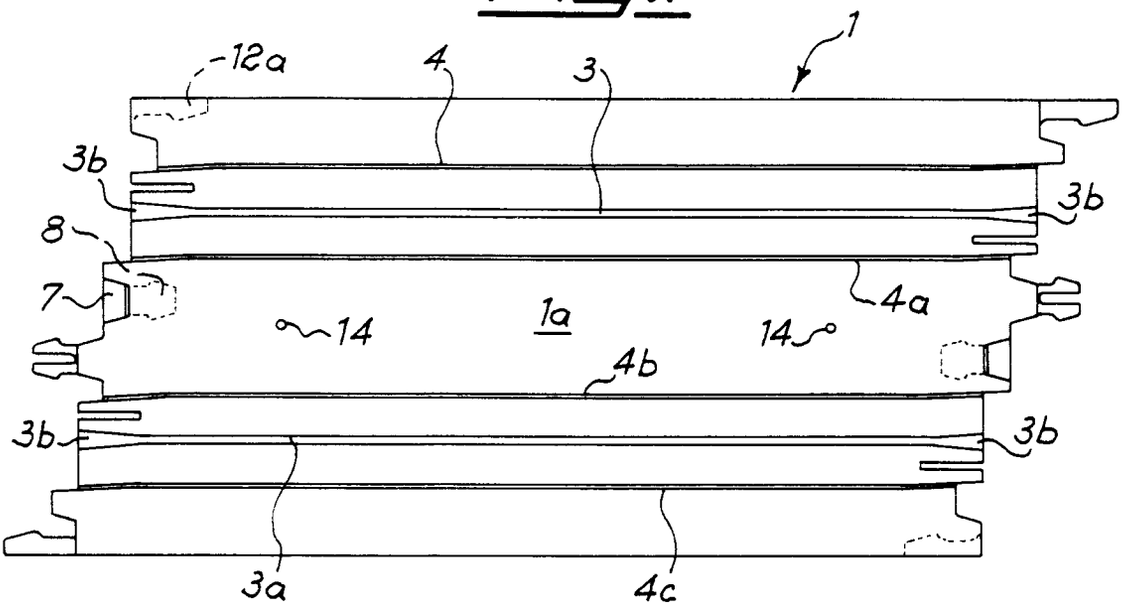


Fig.2

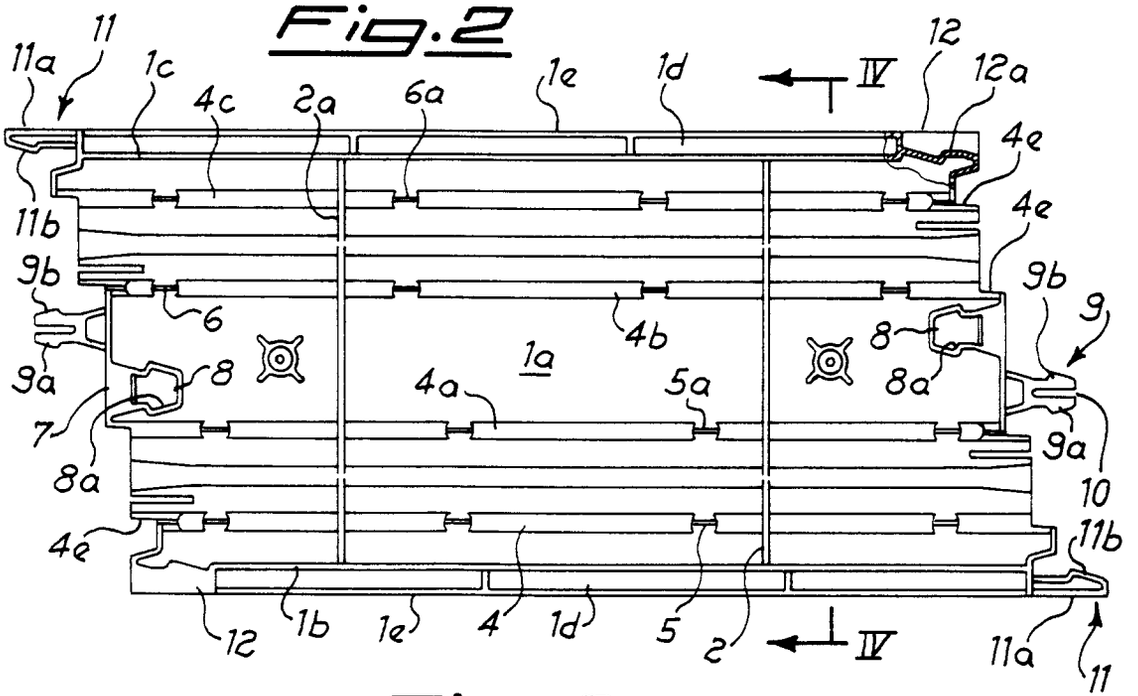


Fig.3

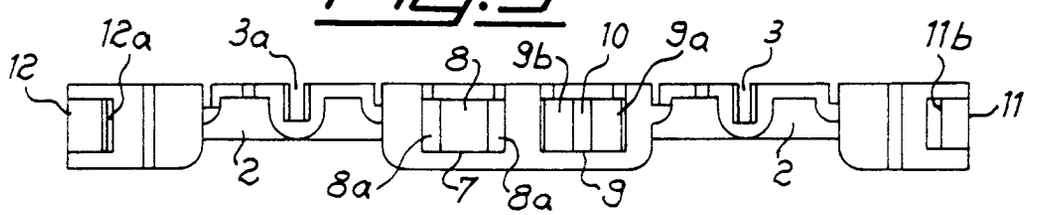
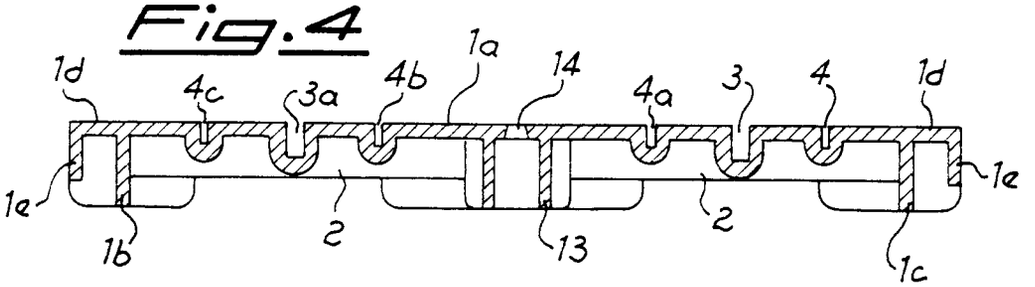


Fig.4



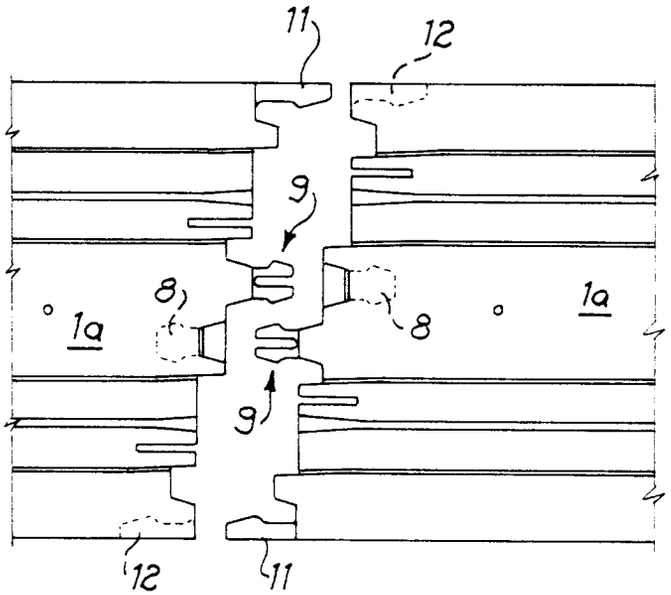
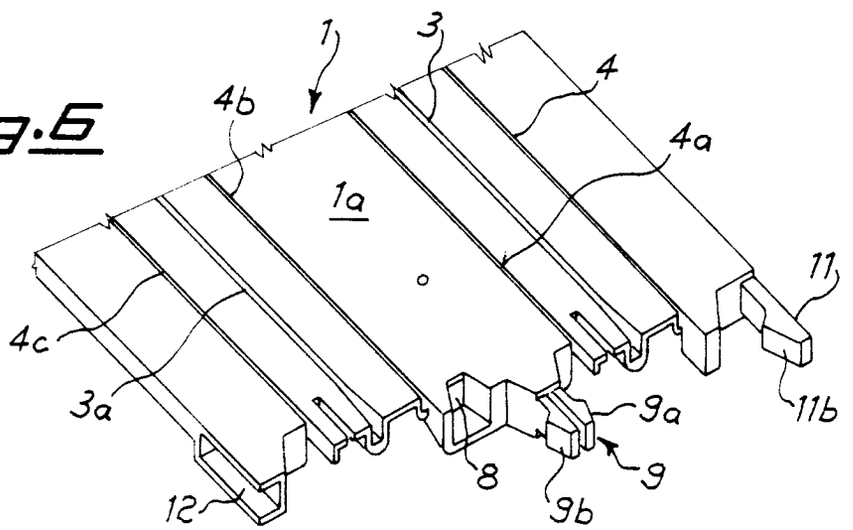


Fig.5

Fig.6



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EUROPEAN SEARCH REPORT

Application Number

EP 92 20 2036

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.5)
Y	US-A-4 997 187 (SMOLLAR et al.) * Figures 1,3,4; column 1, lines 25,26; column 3, lines 39-44; column 4, lines 9-20 *	1-6	A 63 H 18/02
A		2	
Y	FR-A-1 352 734 (RIVAROSSI) * Figures 3,4; page 1, column 2, lines 11-25 *	1-6	
Y	FR-A-1 426 771 (FRANCE-JOUET S.A.) * Figures 1-5; page 1, column 2, lines 8-10 *	1-6	
Y	US-A-2 764 357 (ROVEX SCALE MODELS LTD) * Figures 1,2; column 2, lines 22-36 *	2	
Y	GB-A- 854 120 (VOLLMER) * Figure 4; page 2, lines 53-61 *	5	
A		6	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
Y	US-A-4 544 094 (SCHOLEY) * Figure 3 *	6	A 63 H
A	US-A-4 082 220 (CHENG et al.) * Figures 1-4 *	1,4	
A	DE-A-1 954 428 (A/S LEGO SYSTEM BILLUND) * Figure 1; page 3, lines 30-35 *	1	
A	DE-A-3 003 846 (GOG) * Figure 2; page 10, lines 5-11 *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11-07-1992	PAPA E.R.

CATEGORY OF CITED DOCUMENTS

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