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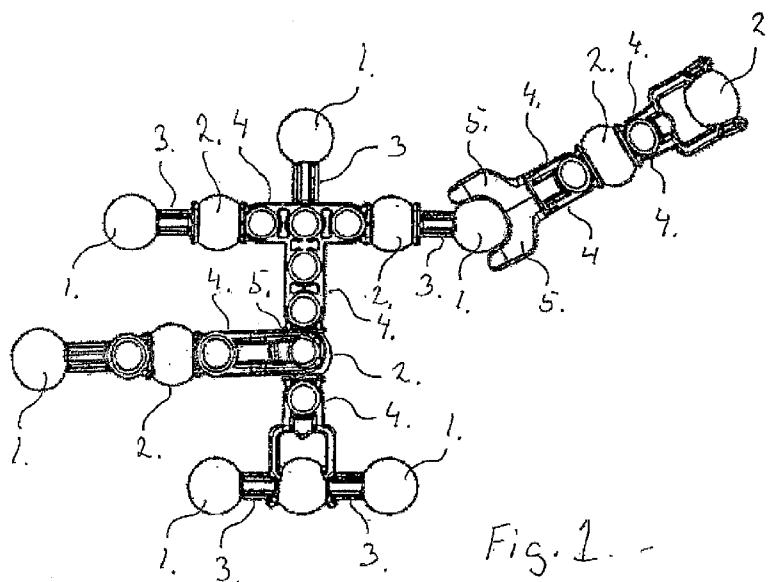
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(54) Title: A TOY BUILDING SET



(57) Abstract: A toy building set comprising a group of building elements, each having at least one ball 1, 2 arranged on the building element, and where the ball 1, 2 is connected to other parts of the building element via a connection rod 3, 4, and where the toy building set further comprises at least one element having a socket formed by two jaws 5, being arranged and adapted for receiving said ball 1, 2 in order to form a ball and socket joint, and where the cross section of the connection rod 3, from where it is connected to the ball 1 and at least a distance away from the ball 1, is smaller than the cross section of the ball 1, so that it gives a certain degree of freedom for the socket to rotate around the ball 1. The connection rods 3, 4 also comprise connections rods 4 having a relatively large cross section, so that the connection rods 4 with a relatively large cross section reduces the degree of freedom for the socket to rotate around the ball 2.

WO 2012/052509 A1

### A toy building set

The present invention relates to a toy building set comprising a group of building elements, each having at least one ball arranged on the building  
5 element, and where the ball is connected to other parts of the building element via a connection rod, and where the toy building set further comprises at least one element having a socket arranged and adapted for receiving said ball in order to form a ball and socket joint, and where the cross section of  
10 the connection rod, from where it is connected to the ball and at least a distance away from the ball, is smaller than the cross section of the ball, so that it gives a certain degree of freedom for the socket to rotate around the ball.

Thereby it is possible for e.g. a child to build constructions, such as toy figures having articulated body parts.

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### Description of related art

An example of such a toy building set is known from EP patent application  
20 no. 856341 disclosing a number of separate building elements that can be connected via ball and socket joints to form an articulated toy figure.

The problem in relation to this kind of toy building sets is that it does not provide many different ways of connecting the separate elements to each other.

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In relation to toy building sets it is therefore a constant challenge to provide such building sets that gives the possibility to build many different constructions or figures by using the same basic elements.

30 This is achieved to a certain degree with the toy building set according to US patent no. 579681, disclosing many different kinds of elements having cou-

pling balls and complementary sockets that can be connected to each other in many different ways to form articulated figures or constructions.

### Summary of the invention

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The main object of the present invention is to provide a toy building set giving the user more different ways of building articulated figures having different patterns of possible movements.

10 This is obtained by the present invention according to claim 1 further specifying that the group of building elements comprises a first and a second type of connecting rods, and in that the first type of connection rod, at least close to the ball, has a cross section being relatively larger than the corresponding cross section of the second type of connection rod, so that the relatively larger cross section of the first type of connection rod reduces the degree of freedom on which the socket can rotate around a ball carried by the first type of connection rod, than the degree of freedom on which the socket can rotate around a ball carried by the second type of connection rod.

20 Thereby the same socket can be mounted on two different both balls being connected to a building element by connection rods with different cross sections, and the degree of freedom on which the socket can rotate around one of the balls will be more limited than the degree of freedom on which the socket can rotate around the other ball. Thereby it is possible, with a relatively limited number of different building elements, to build many different figures or constructions and at the same time providing more different patterns of possible movement or articulation of the figure or construction.

30 In a preferred embodiment the connection rod has an axis of symmetry, and the axis of symmetry extends through the ball carried by the connection rod.

In this relation the axis of symmetry can preferably extend through the centre of the ball.

5 The group of building elements may comprise at least one building element having both a first and a second type of connections rods each carrying a ball. In this way the same building element can provide more different patterns of movement or articulation.

10 A very simple element can in this relation be provided, if at least two of the balls are interconnected by a common connection rod, and especially if the common connection rod has one end forming the first type of connection rod having its relatively larger cross section near one of the balls, and another end forming the second type of connection rod having its smaller cross section near another ball.

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A toy building set according to one or more of claims 4, 5 or 6, **characterized in**, that at the at least one of the building elements has at least one ball having precisely two connecting rods of the first type extending from it.

20 In this relation it is further possible that at least one other ball has only one connecting rod of the second type extending from it.

25 In a further preferred embodiment the socket is formed by two resilient jaws, each having a concave coupling surface facing the other jaw, and having a spacing that ensures that the coupling surfaces on the two jaws lies against opposite sides of the ball, when the socket is mounted on the ball.

30 In this relation it is advantageous if the concave coupling faces on the jaws extend between two side faces, and in that the distance between the two side faces, and the cross section of the first type of connection rods are selected so that the jaws mounted on a ball carried by two of the first type of connec-

tion rods having a common axis of symmetry, can only rotate around the common axis of symmetry of the two connections rods of the first type.

5 Brief description of the drawings

In the following, the invention will be described in greater detail with reference to embodiments shown by the enclosed figures. It should be emphasized that the embodiments shown are used for example purposes only and should not be used to limit the scope of the invention.

Figure 1 shows a simple construction built by using one of each of the building elements shown on figures 2, 3 and 4.

15 Figure 2 is a side front of a first building element according to the invention.

Figure 3 is a side view of a second building element according to the invention.

20 Figure 4 is a side view of a third building element according to the invention.

Detailed description of the embodiments

In fig. 2, 3 and 4 are shown different embodiments of building elements according to the present invention. From the description below it will be evident to the skilled person that many different embodiments than the ones shown on fig. 1, 2 and 3 are possible to suggest in order to provide many different possibilities for building a toy construction, such as a toy figure or the like.

30 In the figures 2 to 4, the building element has different numbers of balls 1, 2 being connected to each other via two different types of connecting rods 3, 4

where the first type of connecting rods 4 has a cross section being larger than the cross section of the second type of connecting rods 3.

The embodiments according to figures 3 and 4 has identical sockets each  
5 formed by two jaws 5 having a concave surface 6 designed for providing a snap fit on any of the balls 1, 2, so that the socket 5 can slide on any of the balls 1, 2 without being released from the ball 1, 2. In figure 3 the jaws are shown in a front view, and in figure 4 the jaws are shown in a side view.

10 In this way the ball 1, 2 being connected to a socket will form an articulated ball and socket joint, so that the building elements provide the possibility to build a number or different articulated constructions or figures by using a varying numbers of building elements according to the invention.

15 As mentioned above it will be possible for the skilled person to suggest other embodiments having more or less balls 1, 2 arranged in many different positions with respect to each other, and be fixed together in their relative positions by means of the two different connection rods 3, 4. The two embodiments shown in figure 3 and 4 shows that the connecting rods 3, 4 are  
20 arranged along the same axis of symmetry S shown by the dotted line, and in figure 2 the connecting rods 3, 4 are arranged along more symmetry lines arranged in common plan, and where only one is shown in the figure. It will be apparent that the skilled person can come up with other arrangements of symmetry lines arranged in 2 or 3 dimensions without departing from the idea  
25 of the present invention.

In this relation the building element according to figure 2 is designed to be used as a corpus element for building a bone structure for a toy figure, and the building elements according to figure 3 and 4 could be used to be  
30 connected to the building element according to figure 2 in order to form a bone structure for limb parts of the toy figure.

In figure 4 is now shown a simple construction built by using the building elements according to figure 2, 3, and 4. The building element according to figure 3 is mounted on the building element according to fig. 2 by snapping the jaws 5 on a ball 1 being carried by a connection rod 3 having a relatively small cross section, and the building element according to figure 4 is mounted on a ball 2 being carried by two connection rods 4 having a relatively larger cross section.

10 Hereby the jaws 5 and thereby the building element according to fig. 4 can, due to the relatively small cross section of the connecting rod 3, rotate around the ball 1 in all directions, and with a high degree of freedom.

On the other hand the relatively large cross section of the connection rods 4 carrying the ball 2 on which the jaws 5 according to the building element shown in figure 4, substantially only allows this building element to rotate around the symmetry axis S when sliding on the ball 2.

In this way the building elements according to the present invention provides more different options for building a large number of different constructions or figures.

## Claims:

1. A toy building set comprising a group of building elements, each having at least one ball arranged on the building element, and where the ball is connected to other parts of the building element via a connection rod, and where the toy building set further comprises at least one element having a socket arranged and adapted for receiving said ball in order to form a ball and socket joint, and where the cross section of the connection rod, from where it is connected to the ball and at least a distance away from the ball, is smaller than the cross section of the ball, so that it gives a certain degree of freedom for the socket to rotate around the ball, **characterized in**, that the group of building elements comprises a first and a second type of connecting rods, and in that the first type of connection rod, at least close to the ball, has a cross section being relatively larger than the corresponding cross section of the second type of connection rod, so that the relatively larger cross section of the first type of connection rod reduces the degree of freedom on which the socket can rotate around a ball carried by the first type of connection rod, than the degree of freedom on which the socket can rotate around a ball carried by the second type of connection rod.
2. A toy building set according to claim 1, **characterized in**, that the connection rod has an axis of symmetry, and in that the axis of symmetry extends through the ball carried by the connection rod.
3. A toy building set according to claim 2, **characterized in**, that the axis of symmetry extends through the centre of the ball.
4. A toy building set according to one or more of the preceding claims, **characterized in**, that the group of building elements comprises at

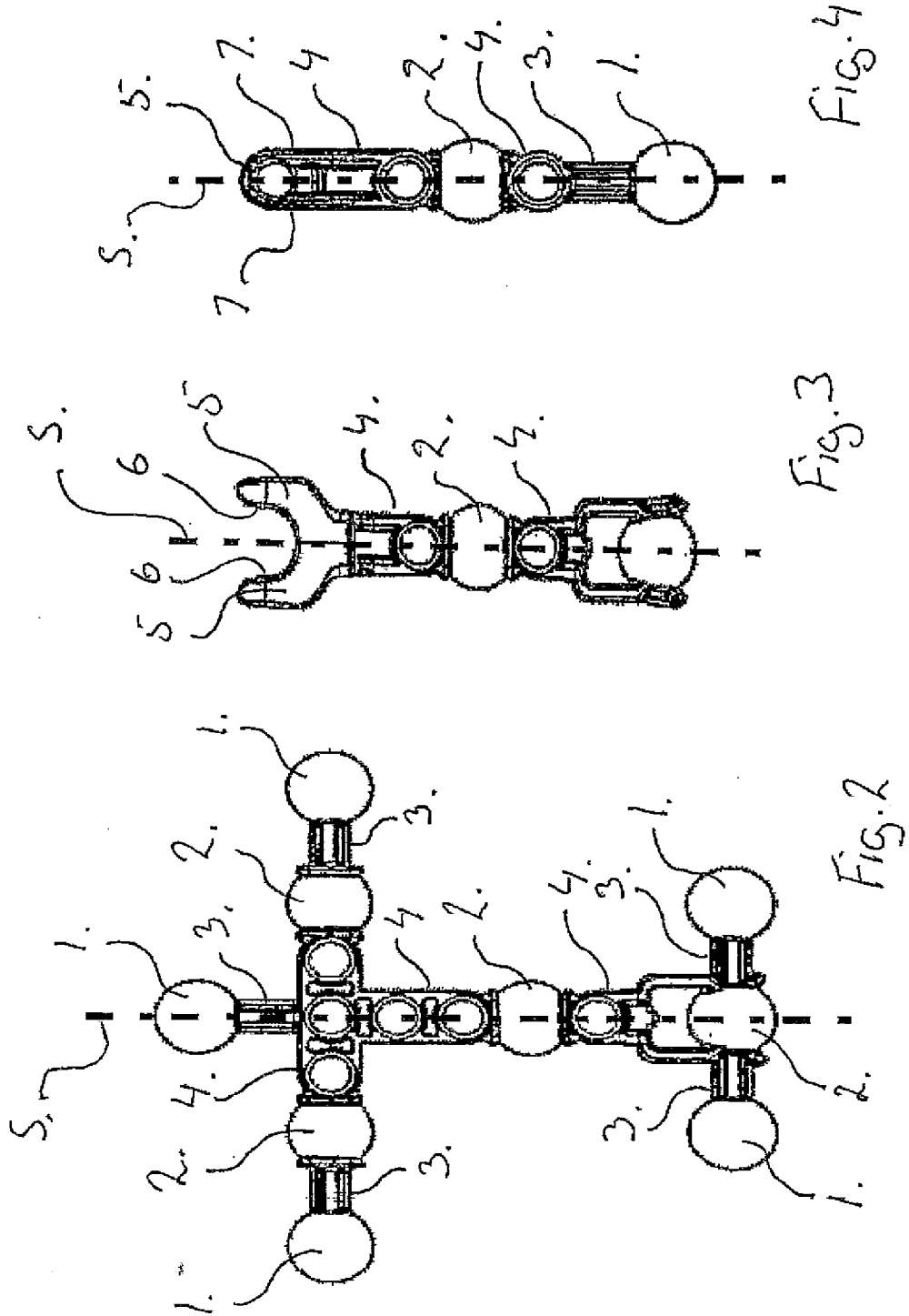


least one building element having both a first and a second type of connections rods each carrying a ball.

5. A toy building set according to claim 4, **characterized in**, that at least two of the balls are interconnected by a common connection rod.
6. A toy building set according to claim 5, **characterized in**, that the common connection rod has one end forming the first type of connection rod having its relatively larger cross section near one of the balls, and another end forming the second type of connection rod having its smaller cross section near another ball.
7. A toy building set according to one or more of claims 4, 5 or 6, **characterized in**, that at least one of the balls has precisely two connecting rods of the first type extending from it.
8. A toy building set according to one or more of claims 4, 5, 6 or 7 **characterized in** and that at least one other ball has only one connecting rod of the second type extending from it.
9. A toy building set according to one or more of the preceding claims, **characterized in**, that the socket is formed by two resilient jaws, each having a concave coupling surface facing the other jaw, and having a spacing that ensures that the coupling surfaces on the two jaws lies against opposite sides of the ball, when the socket is mounted on the ball.
10. A toy building set according to claim 3, 7 and 9, **characterized in**, that the concave coupling faces on the jaws extend between two side faces, and in that the distance between the two side faces, and the cross section of the first type of connection rods are selected so that

the jaws mounted on a ball carried by two of the first type of connection rods having a common axis of symmetry, can only rotate around the common axis of symmetry of the two connections rods of the first type.





INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2011/068332

A. CLASSIFICATION OF SUBJECT MATTER  
INV. A63H33/06  
ADD.  
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)  
A63H

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 769 681 A (GREENWOOD SR DONALD LEE [US] ET AL) 23 June 1998 (1998-06-23) cited in the application column 4, line 14 - column 6, line 49; figures	1-10
A	----- WO 2008/100417 A2 (INFINITOY INC [US]; PINSKER JEFF [US]) 21 August 2008 (2008-08-21) page 3, line 12 - page 4, line 3; figures	1-10
A	----- DE 87 01 264 U1 (LINHART, JIRKA) 23 July 1987 (1987-07-23) page 2, line 9 - line 26; figure 1 ----- -/--	1-10

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

"E" earlier document but published on or after the international filing date

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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Date of the actual completion of the international search  2 November 2011	Date of mailing of the international search report  09/11/2011
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Lucas, Peter
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2011/068332

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 068 886 A2 (INTERLANDER PATERMANN S L [ES]) 17 January 2001 (2001-01-17) paragraph [0185] - paragraph [0199]; figures -----	1-10
A	US 5 897 417 A (GREY MICHAEL) 27 April 1999 (1999-04-27) column 2, line 55 - column 6, line 26 column 12, line 13 - line 44; figures 1,10 -----	1-10

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2011/068332
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