

(19)



(11)

EP 1 663 430 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
02.05.2007 Bulletin 2007/18

(51) Int Cl.:
A63H 33/04 (2006.01)

(21) Application number: **03751074.0**

(86) International application number:
PCT/IB2003/004208

(22) Date of filing: **25.09.2003**

(87) International publication number:
WO 2004/089495 (21.10.2004 Gazette 2004/43)

(54) **ACCESSORY FOR MAGNETIC CONSTRUCTION GAMES**

ZUBEHÖR FÜR MAGNETBAUSPIEL

ACCESSOIRE POUR JEU DE CONSTRUCTION MAGNETIQUE

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

(72) Inventor: **Barone, Natale**
98000 Monaco (MC)

(30) Priority: **07.04.2003 IT IM20030003**

(74) Representative: **Pizzoli, Antonio et al**
Società Italiana Brevetti SpA,
Via G. Carducci 8
20123 Milano (IT)

(43) Date of publication of application:
07.06.2006 Bulletin 2006/23

(73) Proprietor: **Barone, Natale**
98000 Monaco (MC)

(56) References cited:
WO-A-02/055168 DE-A- 3 910 304
FR-A- 2 153 792 GB-A- 2 123 306

EP 1 663 430 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention relates to an accessory for magnetic construction games, and in particular to an accessory which allows the mutual movement of one or more member groups of a magnetic construction game.

[0002] WO 99/60583 discloses a magnetic construction game comprising a plurality of magnetic bars suitable for being mutually joined by means of ferromagnetic spheres so as to made up a complex structure.

[0003] WO 02/055168 and WO 02/076565 disclose instead some accessories for said magnetic game, which serve for reinforcing the joining between the magnetic bars and the ferromagnetic spheres.

[0004] FR-A-2 153 792 discloses another example of a magnetic construction game.

[0005] However, the structure made up of the magnetic bars, the ferromagnetic spheres and the relevant accessories is substantially static, i.e. does not allow a smooth mutual movement of the members, so that the user's fun is limited with respect to other construction games of the dynamic kind.

[0006] It is therefore an object of the present invention to provide an accessory which overcomes said disadvantage, i.e. an accessory which allows the mutual movement of one or more member groups of a magnetic construction game of the above mentioned kind. Said object is achieved with an accessory, the main features of which are disclosed in the first claim, while other features are disclosed in the subsequent claims.

[0007] Thanks to the connecting plates and to the ferromagnetic members having a substantially spherical and/or hemispherical shape, the accessory according to the present invention can be inserted into a complex structure of the magnetic game for allowing the mutual movement of some parts thereof, so that this structure is not static but dynamic.

[0008] Furthermore, thanks to the particular shape, material and/or size of said plates and/or ferromagnetic members, the accessory according to the present invention can be added to a known magnetic game without any modification of the existing members nor aesthetic or modularity problems.

[0009] According to a particular aspect of the invention, the accessory according to the present invention can be employed not only for the mutual movement of the parts of a composite structure, but also as a skate, so that this structure can slide on any surface.

[0010] Further advantages and features of the accessory according to the present invention will become clear to those skilled in the art from the detailed and non-limiting description of two embodiments thereof with reference to the attached drawings, wherein:

- figure 1 shows a side view of a first embodiment of the accessory according to the present invention;
- figure 2 shows a top view of the accessory of figure 1;
- figure 3 shows a side cross-sectioned view along

plane III-III of the accessory of figure 1;

- figure 4 shows a side view of a second embodiment of the accessory according to the present invention; and
- 5 - figure 5 shows a top view of the accessory of figure 4.

[0011] Referring to figures 1 to 3, it is seen that the accessory according to the first embodiment of the invention comprises two ferromagnetic members 1, 2 having a substantially spherical shape in which a diametral hole, i.e. passing through the center, is made. A pin 3 (shown with broken lines in figure 2) is inserted into said diametral holes so that the ferromagnetic members 1, 2 can rotate in an independent manner around its longitudinal axis A in the direction indicated by the arrows of figure 1. Known magnetic bars 4 can thus be applied to any point of the surface of the ferromagnetic members 1, 2, so as to allow the rotation of said bars around axes A. Preferably, the outer diameter d of the ferromagnetic members 1, 2 is substantially equal to the diameter, in particular comprised between 12 and 13 mm, of the known ferromagnetic spheres 5, which can be in turn applied to the free ends of bars 4. The distance D between the ferromagnetic members 1, 2 is substantially equal to the length of the magnetic bars 4, in particular comprised between 14 and 16 mm or between 25 and 27 mm. Pin 3 is made of steel or brass, while the ferromagnetic members 1, 2 are made of steel, with a high percentage of ferrite. The two pins 3 of the ferromagnetic members 1, 2 are suitably arranged between two plates 6, 7 having an elongated shape, which are substantially perpendicular to axis A, so as to made up a skate having the ferromagnetic members 1, 2 as wheels. Plates 6, 7 are mutually connected by at least one bridge 8 which is arranged between the ferromagnetic members 1, 2 and has the upper surface preferably lying on a plane B aligned with the upper ends of the ferromagnetic members 1, 2. Plates 6, 7 are further provided with folds 9, so that their central lateral surface lies on a plane C aligned with the lateral ends of the ferromagnetic members 1, 2. Plates 6, 7 and bridge 8 are made of a single piece of a ferromagnetic material, so that the magnetic bars 4 can be applied to their outer surfaces.

[0012] Referring to figures 4 and 5, it is seen that the accessory according to the second embodiment of the invention comprises, as in the first embodiment, two plates 6, 7, which are however longer, so as to pivot three or more ferromagnetic members having a spherical shape, between which two or more bridges 8 are arranged. The present embodiment comprises two pairs of members having a substantially hemispherical shape 10, 11 and 12, 13 with the circular plane surfaces arranged side by side, instead of two ferromagnetic members having a spherical shape arranged at the ends of plates 6, 7. Each of these hemispherical ferromagnetic members 10, 11, 12, 13 can rotate in an independent manner around the longitudinal axis of pins 3 inserted into corresponding axial holes, i.e. perpendicular to the

center of their circular plane surfaces. Also the outer diameter d of the ferromagnetic members 10, 11, 12, 13 is substantially equal to the diameter, in particular comprised between 12 and 13 mm, of the ferromagnetic spheres 5.

[0013] Further variations and/or additions may be made by those skilled in the art to the embodiments hereinabove described and illustrated, while remaining within the scope of the invention as defined in the claims. In particular, the number of the ferromagnetic members having a substantially spherical or hemispherical shape may vary according to the kind of connection desired in the resulting structure.

Claims

1. Accessory for magnetic construction games which comprise one or more magnetic bars (4) suitable for being mutually joined through ferromagnetic spheres (5) so as to made up a complex structure, **characterized by** comprising at least two ferromagnetic members having a substantially spherical (1, 2) and/or hemispherical (10, 11, 12, 13) shape which are pivoted between two plates (6, 7) having an elongated shape for rotating in an independent manner around an axis (A) substantially perpendicular to these plates (6, 7).
2. Accessory according to the previous claim, **characterized in that** the plates (6, 7) are mutually connected by one or more bridges (8) arranged between the ferromagnetic members (1, 2; 10, 11, 12, 13).
3. Accessory according to the claim 2, **characterized in that** the upper surface of the bridges (8) lies on a plane (B) aligned with the upper ends of the ferromagnetic members (1, 2; 10, 11, 12, 13).
4. Accessory according to one of the previous claims, **characterized in that** the plates (6, 7) are provided with folds (9), so that their lateral surface lies on a plane (C) aligned with the lateral ends of the ferromagnetic members (1, 2; 10, 11, 12, 13).
5. Accessory according to one of the previous claims, **characterized in that** the plates (6, 7) and the bridge (8) are made of a single piece of a ferromagnetic material.
6. Accessory according to one of the previous claims, **characterized by** comprising at least two ferromagnetic members (10, 11, 12, 13) having a substantially hemispherical shape with the circular plane surfaces arranged side by side.
7. Accessory according to one of the previous claims, **characterized in that** the outer diameter (d) of the

ferromagnetic members having a substantially spherical (1, 2) and/or hemispherical (10, 11, 12, 13) shape is substantially equal to the diameter of said ferromagnetic spheres (5).

8. Accessory according to claim 7, **characterized in that** said diameter (d) is comprised between 12 and 13 mm.
9. Accessory according to one of the previous claims, **characterized in that** the distance (D) between the ferromagnetic members having a substantially spherical (1, 2) and/or hemispherical (10, 11, 12, 13) shape is substantially equal to the length of said magnetic bars (4).
10. Accessory according to claim 9, **characterized in that** said distance (D) is comprised between 14 and 16 mm or between 25 and 27 mm.

Patentansprüche

1. Zubehör für Magnetbauspiele, die einen oder mehrere magnetische Stäbe (4) umfassen, die geeignet sind, über ferromagnetische Kugeln (5) miteinander verbunden zu werden, um eine komplexe Struktur zu bilden, **dadurch gekennzeichnet, dass** es wenigstens zwei ferromagnetische Elemente im Wesentlichen mit einer Kugelform (1, 2) und/oder Halbkugelform (10, 11, 12, 13) umfasst, die zwischen zwei Platten (6, 7) mit einer langgestreckten Form drehbar sind, um sie auf unabhängige Weise um eine zu diesen Platten (6, 7) im Wesentlichen senkrechte Achse (A) zu drehen.
2. Zubehör nach dem vorangehenden Anspruch, **dadurch gekennzeichnet, dass** die Platten (6, 7) durch eine oder mehrere zwischen den ferromagnetischen Elementen (1, 2; 10, 11, 12, 13) angeordnete Brücken (8) miteinander verbunden sind.
3. Zubehör nach Anspruch 2, **dadurch gekennzeichnet, dass** die obere Oberfläche der Brücken (8) in einer Ebene (B) liegt, die auf die oberen Enden der ferromagnetischen Elemente (1, 2; 10, 11, 12, 13) ausgerichtet ist.
4. Zubehör nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Platten (6, 7) mit Falzen (9) versehen sind, sodass ihre seitliche Oberfläche in einer Ebene (C) liegt, die auf die seitlichen Enden der ferromagnetischen Elemente (1, 2; 10, 11, 12, 13) ausgerichtet ist.
5. Zubehör nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die Platten (6, 7) und die Brücke (8) aus einem einzelnen Stück

eines ferromagnetischen Werkstoffs hergestellt sind.

6. Zubehör nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** es wenigstens zwei ferromagnetische Elemente (10, 11, 12, 13) mit im Wesentlichen Halbkugelform umfasst, wobei die kreisförmigen ebenen Flächen nebeneinander angeordnet sind.
7. Zubehör nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der Außendurchmesser (d) der ferromagnetischen Elemente, die eine im Wesentlichen Kugelform (1, 2) und/oder Halbkugelform (10, 11, 12, 13) aufweisen, im Wesentlichen gleich dem Durchmesser der ferromagnetischen Kugel (5) ist.
8. Zubehör nach Anspruch 7, **dadurch gekennzeichnet, dass** der Durchmesser (d) zwischen 12 und 13 mm umfasst.
9. Zubehör nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der Abstand (D) zwischen den ferromagnetischen Elementen, die eine im Wesentlichen Kugelform (1, 2) und/oder Halbkugelform (10, 11, 12, 13) aufweisen, im Wesentlichen gleich der Länge der magnetischen Stäbe (4) ist.
10. Zubehör nach Anspruch 9, **dadurch gekennzeichnet, dass** der Abstand (D) zwischen 14 und 16 mm oder zwischen 25 und 27 mm umfasst.

Revendications

1. Accessoire pour jeux de construction magnétique qui comportent une ou plusieurs barres magnétiques (4) adaptées pour être mutuellement reliées par l'intermédiaire de sphères ferromagnétiques (5) de manière à constituer une structure complexe, **caractérisé en ce qu'il** comporte au moins deux éléments ferromagnétiques ayant une forme sensiblement sphérique (1, 2) et/ou hémisphérique (10, 11, 12, 13) qui pivotent entre deux plaques (6, 7) ayant une forme allongée pour tourner d'une manière indépendante autour d'un axe (A) sensiblement perpendiculaire à ces plaques (6, 7).
2. Accessoire selon la revendication précédente, **caractérisé en ce que** les plaques (6, 7) sont mutuellement reliées par un ou plusieurs ponts (8) agencés entre les éléments ferromagnétiques (1, 2 ; 10, 11, 12, 13).
3. Accessoire selon la revendication 2, **caractérisé en ce que** la surface supérieure des ponts (8) se trouve

dans un plan (B) aligné avec les extrémités supérieures des éléments ferromagnétiques (1, 2 ; 10, 11, 12, 13).

4. Accessoire selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les plaques (6, 7) sont munies de plis (9) de sorte que leur surface latérale se trouve dans un plan (C) aligné avec les extrémités latérales des éléments ferromagnétiques (1, 2 ; 10, 11, 12, 13).
5. Accessoire selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les plaques (6, 7) et le pont (8) sont constitués d'une pièce unique de matériau ferromagnétique.
6. Accessoire selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comporte au moins deux éléments ferromagnétiques (10, 11, 12, 13) ayant une forme sensiblement hémisphérique, les surfaces planes circulaires étant agencées côte à côte.
7. Accessoire selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le diamètre extérieur (d) des éléments ferromagnétiques ayant une forme sensiblement sphérique (1, 2) et/ou hémisphérique (10, 11, 12, 13) est sensiblement égal au diamètre desdites sphères ferromagnétiques (5).
8. Accessoire selon la revendication 7, **caractérisé en ce que** ledit diamètre (d) est compris entre 12 et 13 mm.
9. Accessoire selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la distance (D) entre les éléments ferromagnétiques ayant une forme sensiblement sphérique (1, 2) et/ou hémisphérique (10, 11, 12, 13) est sensiblement égale à la longueur desdites barres magnétiques (4).
10. Accessoire selon la revendication 9, **caractérisé en ce que** ladite distance (D) est comprise entre 14 et 16 mm ou entre 25 et 27 mm.

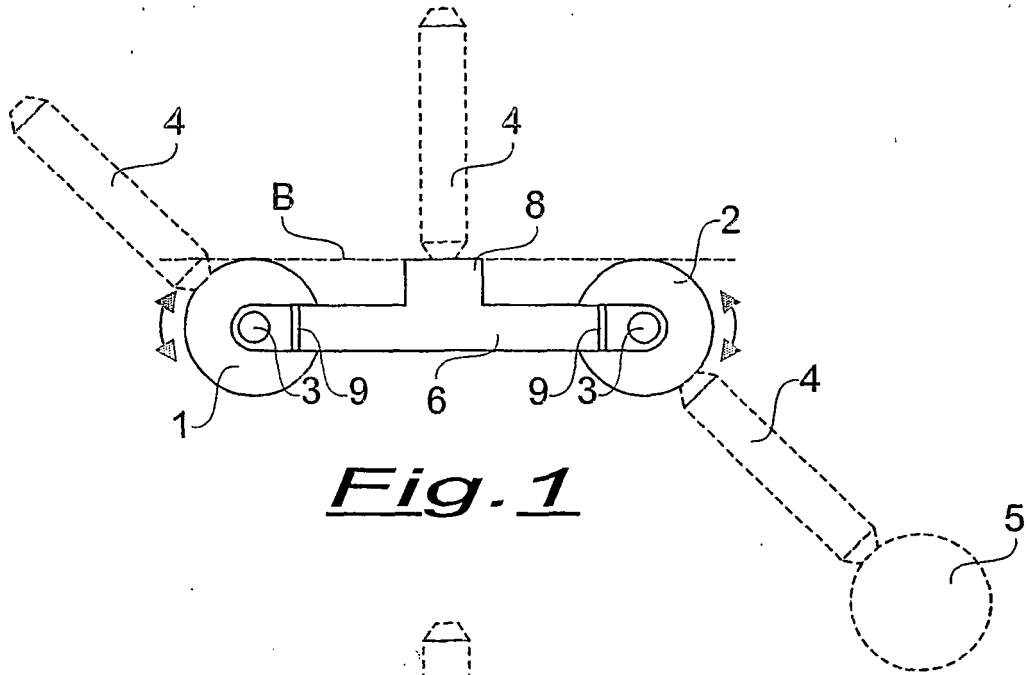


Fig. 1

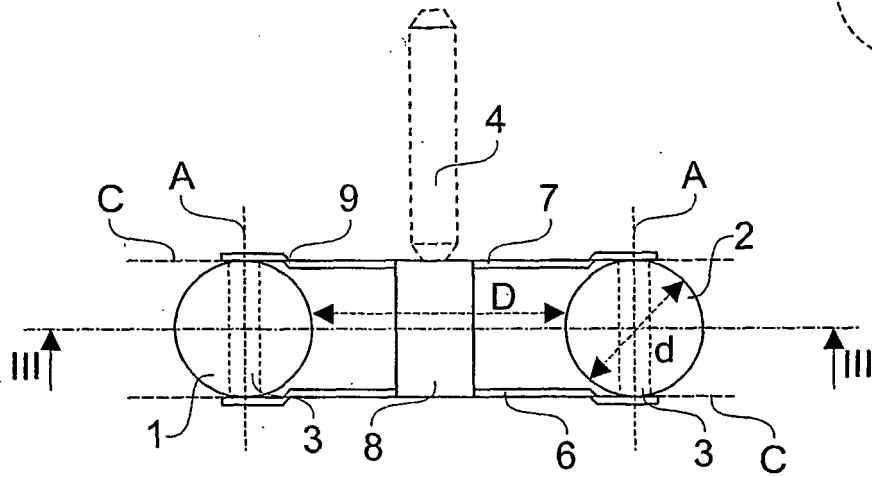


Fig. 2

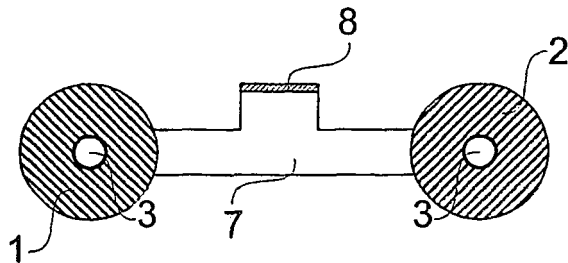


Fig. 3

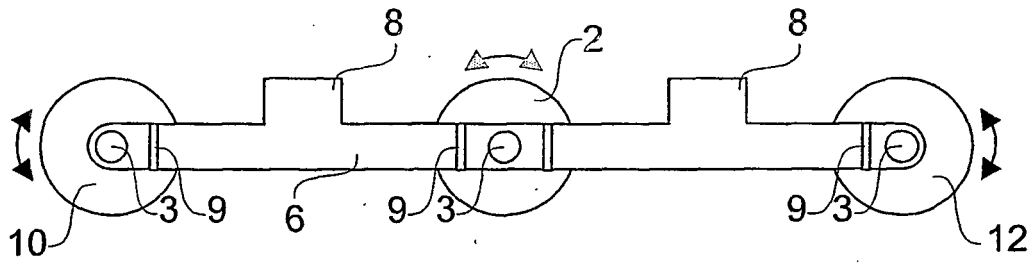


Fig. 4

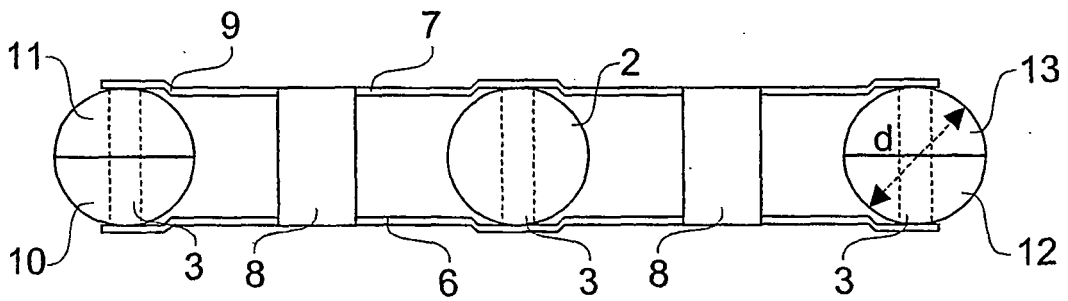


Fig. 5