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(54) MAGNETICALLY CONNECTED TOY BLOCK

(57) The invention discloses a magnetically-connected building block. The magnetically-connected building block comprises a building block body, a magnetic body fixing sleeve and magnetic bodies, wherein a sleeve pipe with the upper end being open is arranged on the building block body, and the magnetic body fixing sleeve is fixed in the sleeve pipe; an insertion groove and a clamping groove are formed in the upper side and the lower side of the magnetic body fixing sleeve correspondingly, the insertion groove is located outside the sleeve pipe, and the clamping groove is located inside the sleeve pipe; the magnetic bodies include the first magnetic body and the second magnetic body, the first magnetic body is arranged in the insertion groove, the second magnetic body is arranged in the clamping groove, and the polarity direction of the first magnetic body is the same as that of the second magnetic body. According to the invention, the two magnetic bodies are mounted more firmly, cannot be seen or touched by children, and are not prone to falling, and thus the building block is safer when played with and used; a magnetic body automatic-guiding system formed by the two magnetic bodies can inspire children with the building block mounting sequence; the building blocks can be attached closely and stacked easily.

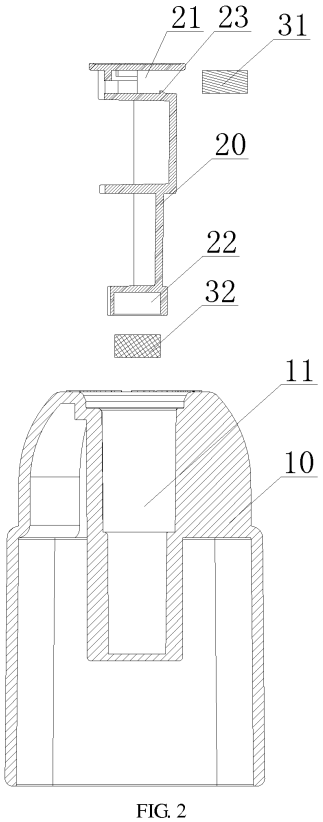

FIG. 2

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Description

BACKGROUND OF THE INVENTION

Technical Field

[0001] The invention relates to the technical field of toys, in particular to a magnetically-connected building block.

2. Description of Related Art

[0002] Building block toys are one of the types of toys frequently played with by children, and various combinations can be formed through different assembling ways; the building block toys are interesting, and can attract children, inspire mental activities of children, and promote development of the intelligence and operational ability of children.

[0003] Traditional building block toys are connected mainly through grooves and lugs matched with the grooves. The building block toys can be connected forcibly even in an incorrect mounting way, and consequentially the inspiration effect on children is poor; in addition, the building blocks are completely fixed after being assembled, so that on the one hand, the combination diversity of the building blocks is limited, and on the other hand, certain motions of a combined assembly cannot be achieved by children, and the mobility of the assembly is extremely poor.

[0004] Magnetic building blocks are provided for solving the problems, however, magnetic bodies are directly pushed into the existing magnetic building blocks or only fixed in the building blocks with glue, and exposed out of the surfaces of the building blocks, magnets are prone to falling, and once the magnets fall, serious dangers can be caused if the magnets are ingested by children; the building blocks of the structure cannot be connected firmly and are poor in inspiration effect.

[0005] The above defects are worth overcoming.

BRIEF SUMMARY OF THE INVENTION

[0006] For overcoming the defects of the prior art, the invention provides a magnetically-connected building block.

[0007] The technical scheme of the invention is as follows:

[0008] The magnetically-connected building block comprises a building block body, and is characterized by further comprising a magnetic body fixing sleeve and magnetic bodies, wherein a sleeve pipe with the upper end being open is arranged on the building block body, and the magnetic body fixing sleeve is fixed in the sleeve pipe; an insertion groove and a clamping groove are formed in the upper side and the lower side of the magnetic body fixing sleeve correspondingly, the insertion groove is located outside the sleeve pipe, and the clamping groove is located inside the sleeve pipe; the upper end of the insertion groove is sealed, and the side face of the insertion groove is open; the magnetic bodies include the first magnetic body and the second magnetic body, the first magnetic body is arranged in the insertion groove and matched with the insertion groove, the second magnetic body is arranged in the clamping groove and matched with the clamping groove, the first magnetic body and the second magnetic body are in sealed connection with the magnetic body fixing sleeve, and the polarity direction of the first magnetic body is the same as that of the second magnetic body.

[0009] Furthermore, the magnetic body fixing sleeve is of a hollow cylindrical structure.

[0010] Furthermore, the section of the insertion groove is of a C-shaped structure, the side face of the clamping groove is sealed, the lower side of the clamping groove is open, and the section of the clamping groove is of an inverted-U-shaped structure.

[0011] Furthermore, the first magnetic body is transversely inserted into the insertion groove, the second magnetic body is longitudinally clamped into the clamping groove from bottom to top, and sealing between the first magnetic body and the magnetic body fixing sleeve as well as between the second magnetic body and the magnetic body fixing sleeve is achieved through ultrasonic waves.

[0012] Furthermore, the upper side of the first magnetic body is the N pole, and the lower side of the second magnetic body is the S pole.

[0013] Furthermore, the magnetic bodies are magnets.

[0014] Furthermore, the magnetic bodies are permanent magnets.

[0015] According to the above structure, the invention has the beneficial effects that the two magnetic bodies are stabilized in proper positions and fixed through an upper magnet storage stand and a lower magnet storage stand which are uniquely designed correspondingly, and ultrasonic waves are used for sealing after the magnetic bodies are placed so that the magnetic bodies can be mounted more firmly, cannot be seen or touched by children, and are not prone to falling and safer when played and used.

[0016] A magnetic body automatic-guiding system is formed through interaction of the two magnetic bodies on the upper side and the lower side, and can remind children of the building block mounting sequence. If the direction is correct, the building blocks can be stacked by children easily; if the direction is incorrect, the upper building block and the lower building block with the same pole repulse mutually when placed together, and thus children can also be reminded.

[0017] The building block is different from other building blocks, which only can be connected after being aligned, on the market. The building blocks of the invention can be attached closely and stacked easily through cooperation of the unique appearance design and the magnetic body sleeve, all children under the age of one

can enjoy the fun of the building blocks through the mutual attraction function of the magnetic bodies, the building blocks can be played by more people and can even be played by children at the age of about six months, and the inspiration effect is more excellent.

[0018] The building block is low in weight, firm in connection, and more comfortable when held in hands of children.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0019]

FIG. 1 is a structural schematic diagram of the invention;
FIG. 2 is a structural exploded view of the invention;
FIG. 3 is a structural schematic diagram of a building block body of the invention; and
FIG. 4 is a structural schematic diagram of a magnetic body fixing sleeve of the invention.

[0020] In the drawings, 10, building block body; 11, sleeve pipe; 20, magnetic body fixing sleeve; 21, insertion groove; 22, clamping groove; 23, clamping position; 31, first magnetic body; 32, second magnetic body.

DETAILED DESCRIPTION OF THE INVENTION

[0021] A further description of the invention is given with accompanying drawings and embodiments as follows:

As is shown in FIGs. 1-2, a magnetically-connected building block comprises a building block body 10, a magnetic body fixing sleeve 20 and magnetic bodies. A sleeve pipe 11 with the upper end being open is arranged on the building block body 10, and the magnetic body fixing sleeve 20 is embedded in the sleeve pipe 11 and ultrasonic waves are used for welding. Preferably, the upper surface of the magnetic body fixing sleeve 20 is lower than the building block body 10 so that an infant can stack the building block easily, and mutual attraction of the magnetic bodies is brought into play accordingly.

[0022] Magnetic storage stands are arranged at the two ends of the magnetic body fixing sleeve 20, namely an insertion groove 21 and a clamping groove 22 are formed in the upper side and the lower side of the magnetic body fixing sleeve 20 correspondingly, the insertion groove 21 is located outside the sleeve pipe 11, and the clamping groove 22 is located inside the sleeve pipe 11; the upper end of the insertion groove 21 is sealed, the side face of the insertion groove 21 is open, and the insertion groove 21 is of a C-shaped structure; the side face of the clamping groove 22 is sealed, the lower side of the clamping groove 22 is open, and the clamping groove 22 is of an inverted-U-shaped structure.

[0023] The magnetic bodies include the first magnetic body 31 and the second magnetic body 32, the first magnetic body 31 is arranged in the insertion groove 21, the second magnetic body 32 is arranged in the clamping groove 22, and the polarity direction of the first magnetic body 31 is the same as that of the second magnetic body 32. It can be guaranteed that both magnets can be placed in correct positions in correct directions, and the functions, the using effect and quality control during production of the building block are all assisted.

[0024] In the embodiment, the upper side of the first magnetic body 31 is the N pole, and the lower side of the second magnetic body 32 is the S pole; when a second building block is stacked on the whole building block in a sleeved mode, the first magnetic body 31 of the lower building block and the second magnetic body 32 of the upper building block are mutually attracted so that the infant can stack the building blocks easily; if the infant places the building blocks in oppoiste directions, the infant can be reminded of the wrong direction so as to correct the direction in time. In the invention, by applying unique magnetic body automatic-guiding systems of the upper building block and the lower building block, the building blocks of the invention are more suitable for children compared with other building blocks.

[0025] Preferably, a clamping position 23 is arranged on the bottom surface of the insertion groove 21, and the first magnetic body 31 can be fixed in the insertion groove 21 more firmly through the clamping position 23.

[0026] The magnetic body fixing sleeve 20 is of a hollow cylindrical structure, and one side of the cylindrical structure is open, so that raw material consumption is further reduced, and meanwhile the overall weight of the building block is reduced.

[0027] The first magnetic body 31 is transversely inserted into the insertion groove, the second magnetic body 32 is longitudinally clamped into the clamping groove from bottom to top, and sealing between the first magnetic body 31 and the magnetic body fixing sleeve 20 as well as between the second magnetic body 32 and the magnetic body fixing sleeve 20 is achieved through ultrasonic waves.

[0028] Preferably, the magnetic bodies can be permanent magnets or non-permanent magnets.

[0029] In the embodiment, the whole building block is injection-molded through ABS plastic resin.

[0030] It should be understood that for ordinary technicians in the field, improvements or transformations can be made according to the above description, and all the improvements and transformations are included in the protection scope of the claims of the invention.

[0031] An illustrative description of the invention is given with the accompanying drawings, obviously, implementation of the invention is not limited by the above embodiment, and various improvements made according to the concept and technical scheme of the invention, or direct application of the concept and technical scheme

of the invention to other occasions without improvement are all included in the protection scope of the invention.

Claims

1. A magnetically-connected building block, comprising a building block body, **characterized by** further comprising a magnetic body fixing sleeve and magnetic bodies, wherein a sleeve pipe with the upper end being open is arranged on the building block body, and the magnetic body fixing sleeve is fixed in the sleeve pipe; an insertion groove and a clamping groove are formed in the upper side and the lower side of the magnetic body fixing sleeve correspondingly, the insertion groove is located outside the sleeve pipe, and the clamping groove is located inside the sleeve pipe; the upper end of the insertion groove is sealed, and the side face of the insertion groove is open; the magnetic bodies include the first magnetic body and the second magnetic body, the first magnetic body is arranged in the insertion groove and matched with the insertion groove, the second magnetic body is arranged in the clamping groove and matched with the clamping groove, the first magnetic body and the second magnetic body are in sealed connection with the magnetic body fixing sleeve, and the polarity direction of the first magnetic body is the same as that of the second magnetic body.

2. The magnetically-connected building block according to Claim 1, **characterized in that** the magnetic body fixing sleeve is of a hollow cylindrical structure.

3. The magnetically-connected building block according to Claim 1, **characterized in that** the section of the insertion groove is of a C-shaped structure, the side face of the clamping groove is sealed, the lower side of the clamping groove is open, and the section of the clamping groove is of an inverted-U-shaped structure.

4. The magnetically-connected building block according to Claim 1, **characterized in that** the first magnetic body is transversely inserted into the insertion groove, the second magnetic body is longitudinally clamped into the clamping groove from bottom to top, and sealing between the first magnetic body and the magnetic body fixing sleeve, as well as between the second magnetic body and the magnetic body fixing sleeve, is achieved through ultrasonic waves.

5. The magnetically-connected building block according to Claim 1, **characterized in that** the upper side of the first magnetic body is the N pole, and the lower side of the second magnetic body is the S pole.

6. The magnetically-connected building block according to Claim 1, **characterized in that** the magnetic bodies are magnets.

7. The magnetically-connected building block according to Claim 6, **characterized in that** the magnetic bodies are permanent magnets.

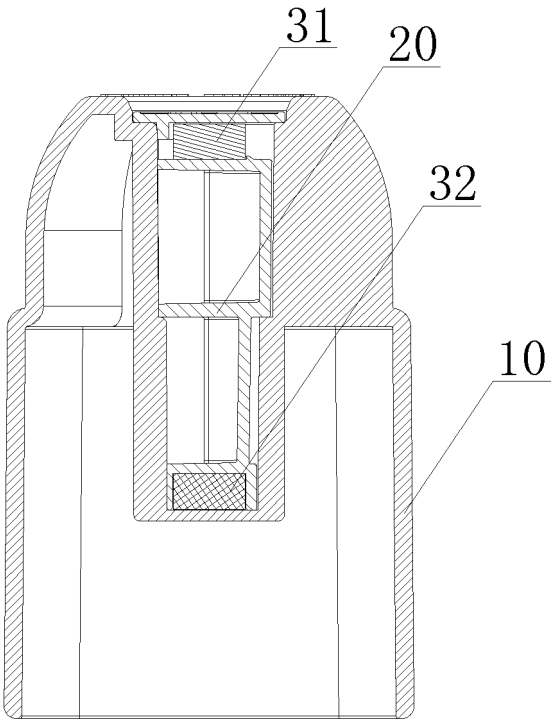

FIG. 1

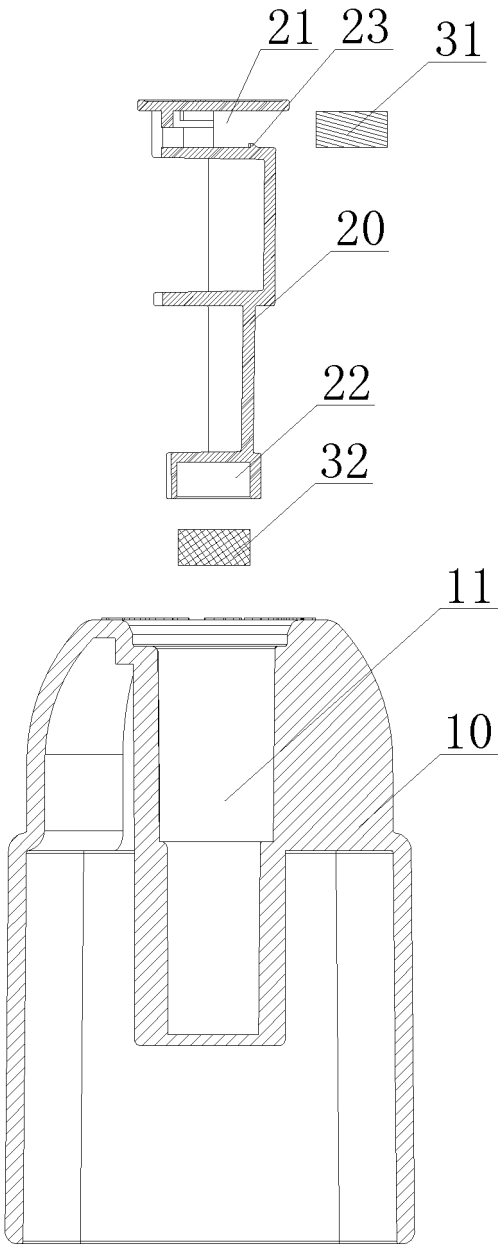

FIG. 2

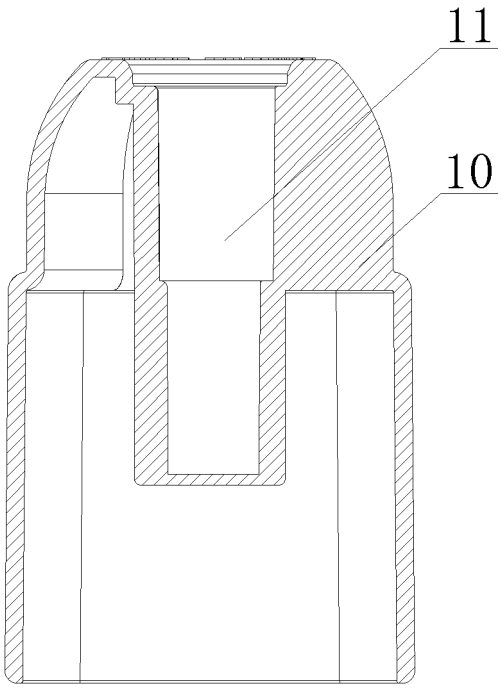

FIG. 3

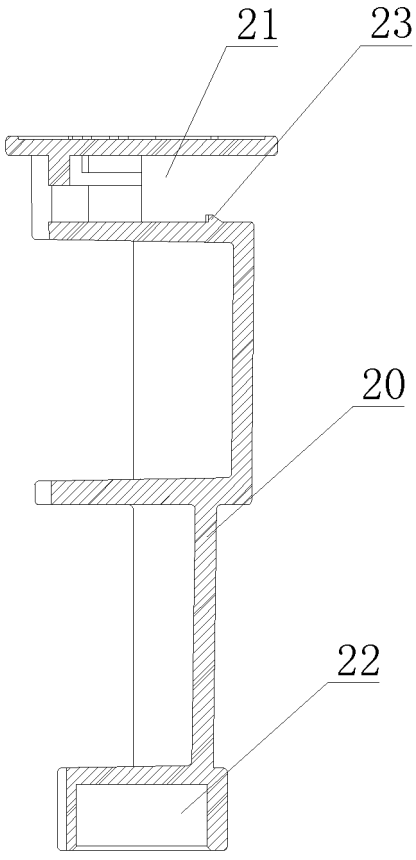

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2015/093752

A. CLASSIFICATION OF SUBJECT MATTER

A63H 33/06 (2006.01) i; A63H 33/26 (2006.01) i
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: 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 practicable, search terms used)

WPI, EPODOC, CPRS, CNKI: block, magnet+, slot+, groov+, insert+, wedge+, imbed+, open+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 20140067453 A (PARK CHEOL) 05 June 2014 (05.06.2014) description, paragraphs [0026]-[0047], and figures 1-6	1-7
A	KR 20130094417 A (KIM YOUNG JUN) 26 August 2013 (26.08.2013) the whole document	1-7
A	CN 104645639 A (SHAOGUAN GUANGHUA PLASTIC HARDWARE PRODUCTS CO., LTD.) 27 May 2015 (27.05.2015) the whole document	1-7
A	CN 202237283 U (TIAN, Xuanguo) 30 May 2012 (30.05.2012) the whole document	1-7

☐ 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 application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"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

"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

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"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 May 2016	03 June 2016
Name and mailing address of the ISA/CN State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer LI, Kai Telephone No. (86-10) 62085515

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2015/093752

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
KR 20140067453 A	05 June 2014	None	
KR 20130094417 A	26 August 2013	KR 101308201 B1	13 September 2013
CN 104645639 A	27 May 2015	None	
CN 202237283 U	30 May 2012	None	

Form PCT/ISA /210 (patent family annex) (July 2009)