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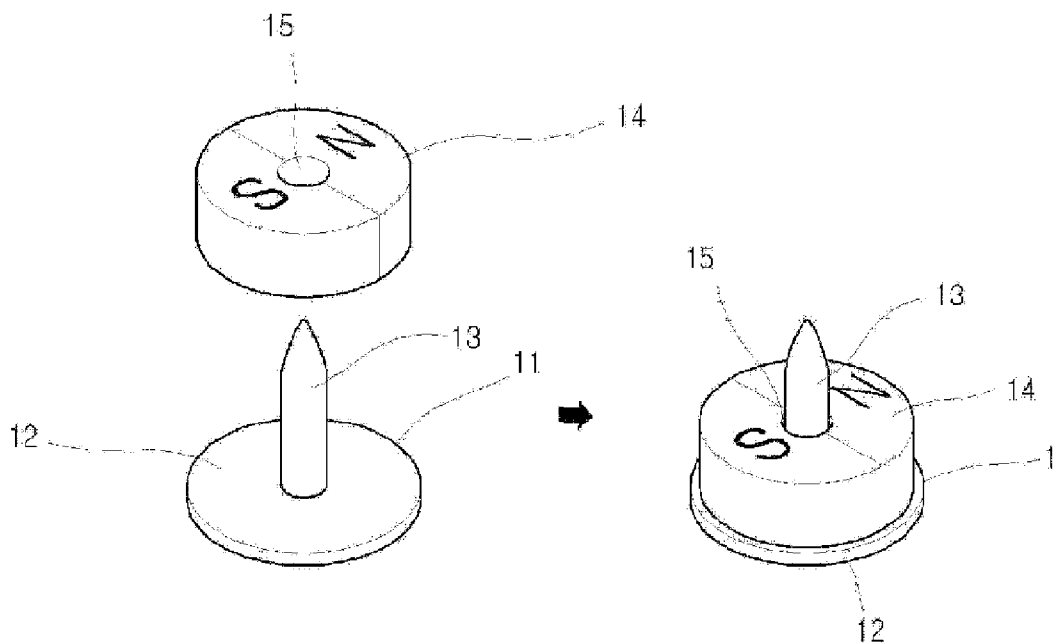
(19) **United States**(12) **Patent Application Publication**
Kim(10) **Pub. No.: US 2010/0022158 A1**(43) **Pub. Date: Jan. 28, 2010**(54) **MAGNET AND PIN FOR BLOCK TOY****Publication Classification**(75) Inventor: **Young Pil Kim**, Suwon-si (KR)(51) **Int. Cl.**
A63H 33/26 (2006.01)
A63H 33/04 (2006.01)

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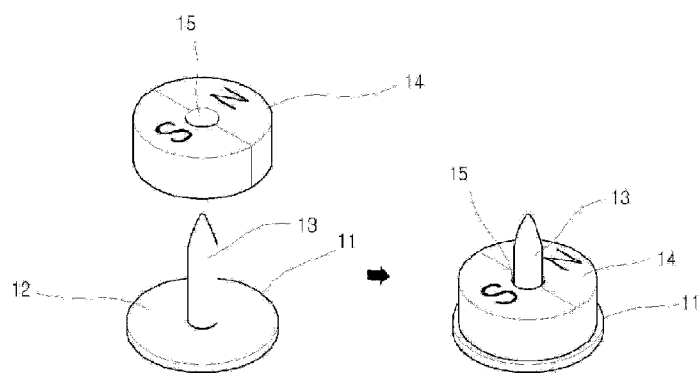
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CHANTILLY, VA 20151 (US)(52) **U.S. Cl. 446/92; 446/129**(73) Assignee: **Dong Wan Kim**, Hwaseong-si (KR)(57) **ABSTRACT**(21) Appl. No.: **12/517,582**(22) PCT Filed: **Dec. 4, 2007**(86) PCT No.: **PCT/KR07/06252**§ 371 (c)(1),
(2), (4) Date: **Jun. 5, 2009**(30) **Foreign Application Priority Data**

Dec. 4, 2006 (KR) 20-2006-0030932

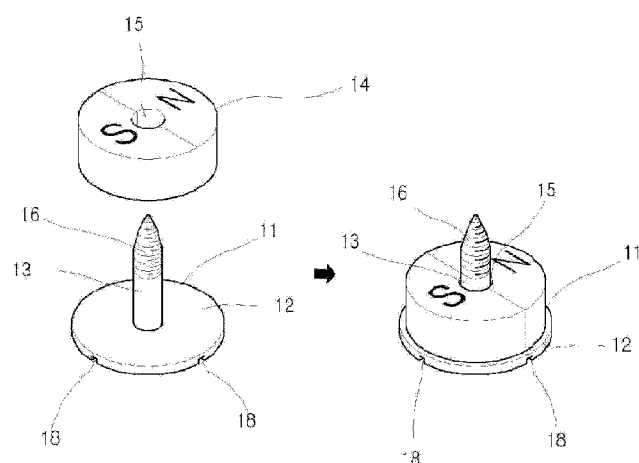
A rotary magnet and a fastening pin for block toys are disclosed. The object of the present invention is to provide a structure such that the production cost can be reduced, the magnet and the pin can be easily installed in a block, and appropriate attractive force can be easily generated between blocks. The fastening pin (11) include a fastening plate part (12), which has a diameter suitable for fitting the fastening plate part into a seating depression (2) of the block (1), and a pin part (13), which has a height greater than that of the rotary magnet (14). The rotary magnet (14) has an N pole and an S pole on the left and right parts thereof. A through hole (15) is formed through the center of the rotary magnet (14), so that the pin part (13) can be inserted into the through hole (15).



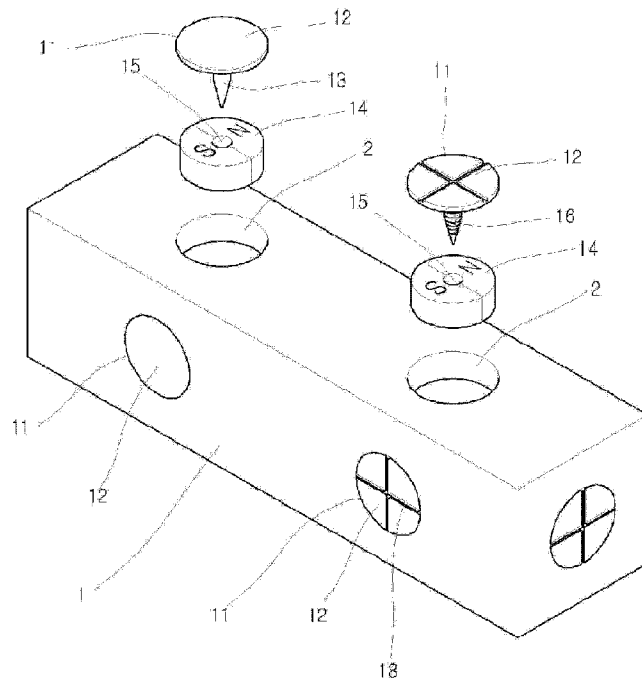
[Fig. 1]



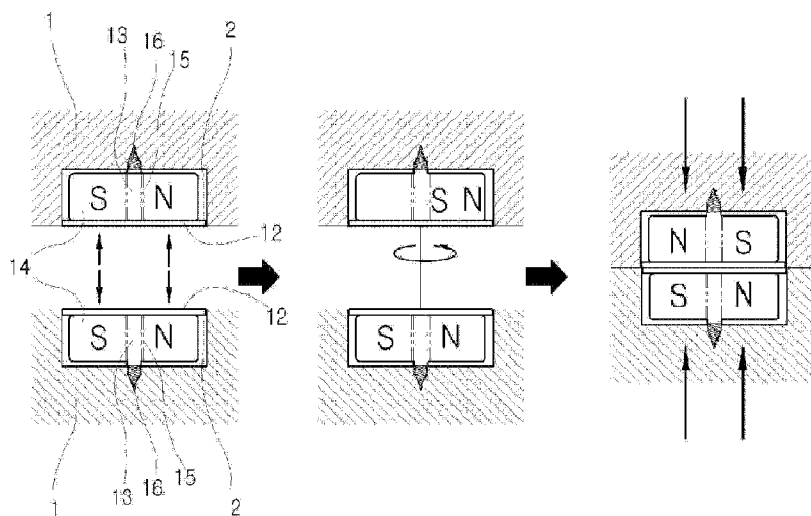
[Fig. 2]



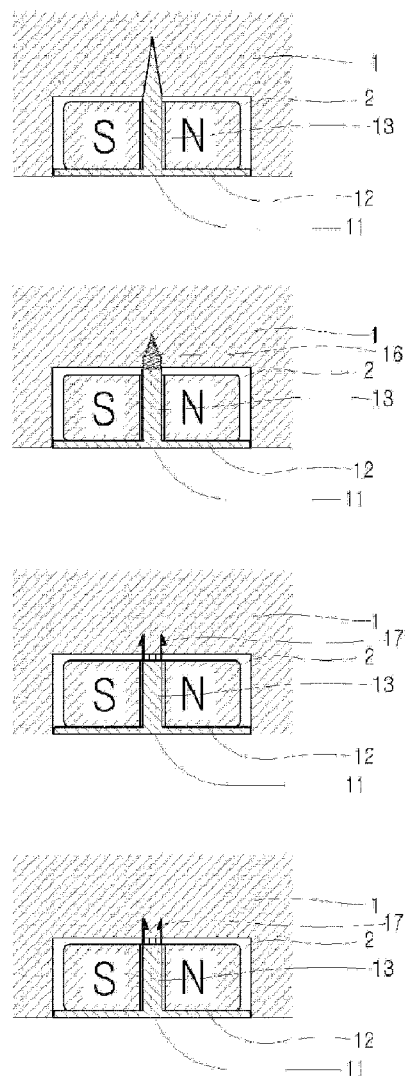
[Fig. 3]



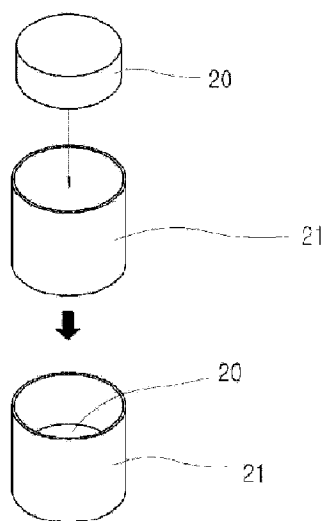
[Fig. 4]



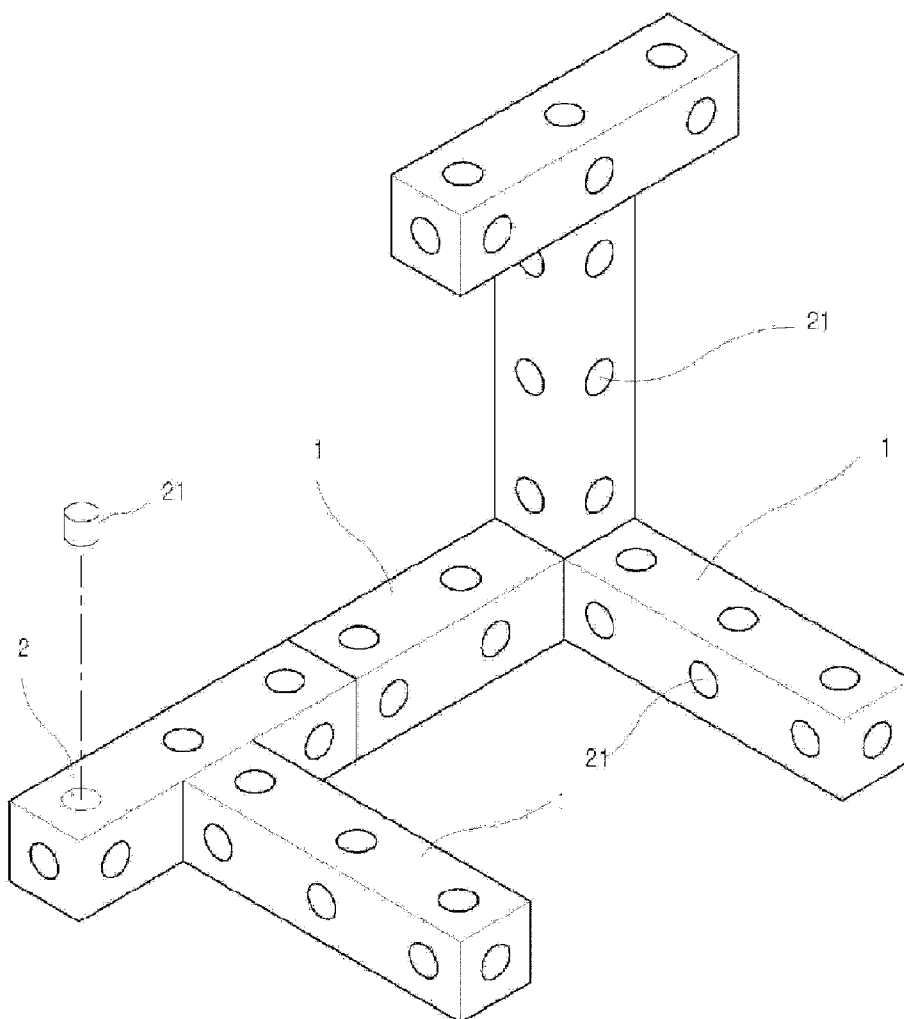
[Fig. 5]



[Fig. 6]



[Fig. 7]



MAGNET AND PIN FOR BLOCK TOY

TECHNICAL FIELD

[0001] The present invention relates, in general, to rotary magnets and fastening pins for block toys, in which blocks are connected to each other using magnetic force to form structures having various shapes, and, more particularly, to a rotary magnet and a fastening pin for block toys for which the production cost is reduced, which can be easily installed in a block, and which can easily generate the correct attractive force between blocks, compared to conventional block toys using permanent magnets and holders.

BACKGROUND ART

[0002] Generally, magnets generate magnetic force. When two magnets are close to each other, the magnetic force acts as an attractive force between unlike poles (between an N pole and an S pole), thus pulling the magnets towards each other, and the magnetic force acts as a repulsive force between like poles (between N poles or between S poles), thus pushing the magnets away from each other.

[0003] In block toys using the principle of the magnetic force, as shown in FIGS. 6 and 7, permanent magnets **20** are installed in respective metal holders **21**, and the holders **21** are inserted into insert holes **2**, which are formed in a block **1** made of wood or synthetic resin, at positions spaced apart from each other at regular intervals. Thus, the blocks **1** can be united to each other using the attractive force between the permanent magnets.

[0004] In such a block toy, the blocks **1** can be connected to each other or stacked on top of one another by uniting them using the attractive force between the permanent magnets, thereby forming various structures. Therefore, the block toy can be used as toys that enhance the creativity of children and promote the children's education.

[0005] As such, the conventional permanent magnets **20** and the holders **21**, which are used in the blocks **1**, are constructed such that the permanent magnets **20** are installed in the respective holders **21**, as shown in FIG. 6, and the holders **21** are force-fitted into the insert hole **2** of the blocks.

[0006] However, the conventional art is problematic in that the holders **21**, which have been force-fitted into the block **1**, may be undesirably removed from the block **1** after repeated use for a long period of time. When the blocks **1** are connected to each other, the permanent magnets **20** may be oriented such that repulsive force therebetween is generated. In this case, to connect the blocks **1** to each other without moving the blocks, one permanent magnet **20** must be turned upside down or rotated with respect to the other magnet to generate attractive force.

[0007] However, in the case where the permanent magnets **20** are attached to the sidewalls of the respective holders **21**, even in the case where repulsive force is generated between the permanent magnets, because the permanent magnets cannot change their orientation and thus do not generate attractive force therebetween, the blocks **1** are not connected to each other.

DISCLOSURE OF INVENTION

Technical Problem

[0008] Accordingly, the present invention has been made keeping in mind the above problems occurring in the prior art,

and an object of the present invention is to provide a fastening pin (**11**) and a rotary magnet (**12**) for block toys, the fastening pin (**11**) taking the place of the holder (**21**) of the prior art, being prevented from being undesirably removed from a block (**1**), and being easily assembled with the block, and the rotary magnet (**14**) being rotatably fitted over the fastening pin (**11**), wherein, after the rotary magnet (**14**) is fitted over the fastening pin (**11**), the fastening pin (**11**) is inserted into a seating depression (**2**) formed in the block.

Technical Solution

[0009] In order to accomplish the above object, the present invention provides a rotary magnet and a fastening pin for block toys, in which blocks are connected to each other using permanent magnets, wherein the fastening pin (**11**) includes: a fastening plate part (**12**) having a diameter suitable to fit the fastening plate part into a seating depression (**2**) of a block (**1**); and a pin part (**13**), having a height greater than a height of the rotary magnet (**14**), and the rotary magnet (**14**) has an N pole and an S pole on left and right parts thereof, with a through hole (**15**) formed through a central portion of the rotary magnet (**14**), so that the pin part (**13**) is inserted into the through hole (**15**).

[0010] Preferably, a tool insert groove (**18**) for insertion of a tool may be formed in the fastening plate part (**12**) of the fastening pin (**11**), and an external thread (**16**) may be formed on the pin part (**13**).

[0011] Furthermore, a hook (**17**) may be provided on an end of the pin part (**13**).

Advantageous Effects

[0012] A fastening pin (**11**) and a rotary magnet (**14**) for block toys according to the present invention can be firmly coupled to and easily removed from the block, unlike the conventional block toy, which uses a permanent magnet **20** and a holder **21**. Therefore, there are advantages in that productivity is enhanced and the rotary magnet (**14**) can be easily replaced with a new one.

[0013] Furthermore, because the rotary magnet (**14**), which is fitted over the fastening pin (**11**), is rotated in a clockwise or counterclockwise direction in place, attractive force can be reliably generated between blocks (**1**). Thus, the blocks (**1**) can be easily connected to each other. Therefore, the present invention is advantageous in that the competitiveness of products can be increased compared to conventional block toys using permanent magnets.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a perspective view illustrating an embodiment of the present invention;

[0015] FIG. 2 is a perspective view illustrating another embodiment of the present invention;

[0016] FIG. 3 is a perspective view showing an example of the installation of the present invention to a block;

[0017] FIG. 4 is sectional views illustrating the rotation of a rotary magnet of the present invention, which is installed in the block;

[0018] FIG. 5 is sectional views showing various shapes of pins according to the present invention;

[0019] FIG. 6 is a perspective view showing a permanent magnet and a holder of a conventional block toy; and

[0020] FIG. 7 is a perspective view showing an example of the conventional block toy.

DESCRIPTION OF THE ELEMENTS IN THE DRAWINGS

[0021] 1: block
 [0022] 11: fastening pin
 [0023] 13: pin part
 [0024] 15: through hole
 [0025] 17: hook
 [0026] 20: permanent magnet
 [0027] 2: seating depression
 [0028] 12: fastening plate part
 [0029] 14: rotary magnet
 [0030] 16: external thread
 [0031] 18: tool insert groove
 [0032] 21: holder

BEST MODE FOR CARRYING OUT THE INVENTION

[0033] Hereinafter, embodiments of a rotary magnet and a fastening pin for block toys according to the present invention will be described in detail with reference to FIG. 1.

[0034] The fastening pin 11 includes a fastening plate part 12, which has a diameter suitable to firmly fit it into a corresponding seating depression 2 of a block 1, and a pin part 13, which has a height greater than that of the rotary magnet 14.

[0035] The rotary magnet 14 has an N pole and an S pole on the left and right parts thereof. A through hole 15, into which the pin part 13 is inserted, is formed through the center of the rotary magnet 14.

[0036] The fastening pin 11 has a shape similar to a thumb-tack. Preferably, the diameter and thickness of the fastening plate part 12 are, respectively, approximately 6 mm and 0.3 mm, and the height of the pin part 13 is approximately 4 mm. Furthermore, the fastening pin 11 is preferably made of stainless steel (SUS304) or SECC steel, which is plated with innocuous material.

[0037] Preferably, the diameter and height of the rotary magnet 14, respectively, are about 5.5 mm and 2 mm, and the magnetic force thereof ranges from 3000 to 4000 gauss. However, the above-mentioned numerical (or intensity) values may be variously changed, rather than being immutable.

[0038] In the present invention, the coupling force between the present invention and the block 1 can be increased through the following additional construction.

[0039] As shown in FIG. 2, a tool insert groove 18 is formed in the fastening plate part 12 of the fastening pin 11, so that a tool such as a screwdriver can be inserted into the tool insert groove 18. An external thread 16 or a hook 17 is provided on the pin part 13.

[0040] In the present invention having the above construction, as shown in FIG. 3, the pin part 13 of the fastening pin 11 is inserted into the through hole 15 such that the rotary magnet 14 is fitted over the pin part 13. Thereafter, the fastening pin 11 is force-fitted into the seating depression 2 of the block 1. At this time, the end of the pin part 13 is driven into the block 1, which is made of wood or synthetic resin, in order to firmly fasten the fastening pin 11 to the block 1.

[0041] In the case where the tool insert groove 18 and the external thread 16 are formed in the fastening pin, when a tool such as a screwdriver is inserted into the tool insert groove 18 and is rotated, the external thread 16 of the fastening pin 11 is threaded into the bottom of the seating depression 2 of the block 1, thus firmly fastening the fastening pin 11 to the block 1, in which case the fastening pin 1 can be reliably prevented from being undesirably removed from the block 1.

[0042] According to the present invention, when two blocks 1 are brought into contact with each other, if the rotary magnets 14, which are provided in the fastening pins 11, which face each other, are oriented such that unlike poles thereof face each other, the blocks 1 are attached to each other by the attractive force between the rotary magnets 14. However, as shown in FIG. 4, if like poles of the rotary magnets face each other, repulsive force therebetween is generated.

[0043] At this time, one of the rotary magnets 14, which are rotatably fitted over the respective pin parts 13, is rotated in a clockwise or counterclockwise direction by the repulsive force, so that the rotary magnet 14 is oriented such that the poles thereof face the unlike poles of the other rotary magnet 14. Then, attractive force between the rotary magnets is generated. Thereby, the two blocks 1 are attached to each other.

[0044] As such, unlike the conventional art of FIG. 6, in which the permanent magnet 20 is fitted into the holder 21, in the present invention, the rotary magnet 14 is fitted over the pin part 13 so as to be rotatable in a clockwise or counterclockwise direction, without adhering to the inner surface of the seating depression, and the rotary magnet 14 is thus prevented from being turned upside down. Therefore, there is an advantage in that attractive force can always be reliably generated between corresponding rotary magnets of two blocks.

[0045] According to the present invention, several blocks 1 can be attached to each other using the attractive force generated between the rotary magnets 14, and various structures can be made using the coupling between the blocks 1.

[0046] Furthermore, in the present invention, even if it is desired to replace the rotary magnet 14 with a new one in the case where the rotary magnet 14 is defective or the lifetime thereof expires, because the fastening pin 11 can be easily removed from the block 1 by inserting a tool such as a screwdriver into the tool insert groove 18 and rotating it in reverse, there is an advantage in that work of replacing the rotary magnet 14 with a new one is very easy.

[0047] In addition, as shown in FIG. 5, to firmly fasten to the fastening pin 11 to the block 1, the end of the pin part 13 of the fastening pin 11 may have a pointed shape or a structure provided with the external thread 16. Alternatively, the end of the pin part 13 may have the shape of the hook 17. As a further alternative, the pin part 13 may be modified to have various shapes, as well as a hook shape. Such modification must be regarded as falling within the scope and spirit of the present invention.

1. A rotary magnet and a fastening pin for block toys, in which blocks are connected to each other using permanent magnets, wherein

the fastening pin (11) comprises: a fastening plate part (12) having a diameter suitable to fit the fastening plate part into a seating depression (2) of a block (1); and a pin part (13), having a height greater than a height of the rotary magnet (14), and

the rotary magnet (14) has an N pole and an S pole on left and right parts thereof, with a through hole (15) formed through a central portion of the rotary magnet (14), so that the pin part (13) is inserted into the through hole (15).

2. The rotary magnet and the fastening pin for block toys according to claim 1, wherein a tool insert groove (18) for insertion of a tool is formed in the fastening plate part (12) of the fastening pin (11), and an external thread (16) is formed on the pin part (13).

3. The rotary magnet and the fastening pin for block toys according to claim 1, wherein a hook (17) is provided on an end of the pin part (13).

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