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(71) 出願人：ピープル株式会社(**PEOPLE CO., LTD.**) [JP/JP]；〒1030004 東京都中央区東日本橋二丁目１５番５号 Tokyo (JP).

(72) 発明者：小暮 雅子 (**KOGURE Masako**)；〒1030004 東京都中央区東日本橋２丁目１５番５号 ピープル株式会社内 Tokyo (JP).

(74) 代理人：長谷川 芳樹，外(**HASEGAWA Yoshiki** et al.)；〒1000005 東京都千代田区丸の内二丁目１番１号丸の内 ＭＹ ＰＬＡＺＡ（明治安田生命ビル） ９階 創英国際特許法律事務所 Tokyo (JP).

(81) 指定国(表示のない限り、全ての種類の国内保護が可能)：AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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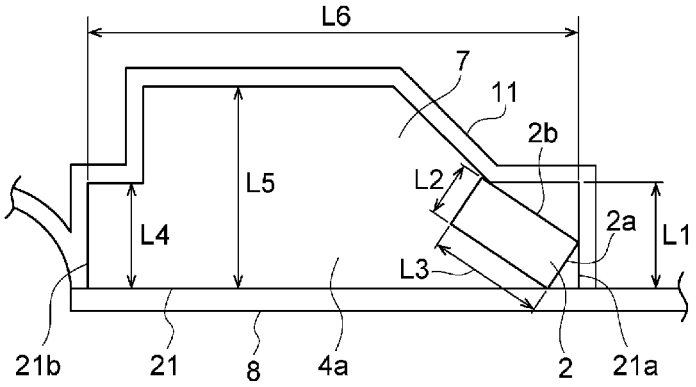
(54) **Title:** MAGNET TYPE PLATE TOY

(54) 発明の名称： 磁石式プレート玩具



(57) **Abstract:** A magnet type plate toy 1 includes a plurality of first magnets 2 and a polygonal plate member 4. The plurality of first magnets 2 have a columnar shape and a magnetization direction orthogonal to an axis direction. The plate member 4 has therein a plurality of first accommodation parts 21 each accommodating one of the plurality of first magnets 2. The plurality of first magnets 2 are accommodated in the first accommodation parts 21 such that the plurality of first magnets 2 are movable along a side part 4a of the plate member 4 and rotatable around a rotation axis along the thickness direction D1 of the plate member 4 and a rotation axis along the axis direction. The plurality of first accommodation parts 21 are arranged with intervals therebetween along the side part 4a of the plate member 4. The plurality of first accommodation parts 21 have an end 21a and an end 21b in the direction along the side part 4a. When viewed from the thickness direction D1, the length L1 of the end 21a is equal to or longer than the length L2 of the first magnets 2 in the direction orthogonal to the axis direction and shorter than the length L3 of the first magnets 2 in the axis direction.

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ZW), ユーラシア (AM, AZ, BY, KG, KZ, RU, TJ, TM), ヨーロッパ (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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一　国際調査報告（条約第21条(3)）

(57) 要約：磁石式プレート玩具１は、複数の第１磁石２と、多角形状のプレート部材４と、を備える。複数の第１磁石２は、柱状を呈すると共に、軸線方向に直交する磁化方向を有する。プレート部材４は、複数の第１磁石２を１つずつ収容する複数の第１収容部２１を内部に有する。複数の第１磁石２は、プレート部材４の辺部４ａに沿って移動可能、かつ、軸線方向に沿う回転軸及びプレート部材４の厚さ方向Ｄ１に沿う回転軸周りに回転可能に第１収容部２１に収容されている。複数の第１収容部２１は、プレート部材４の辺部４ａに沿って互いに離間して配置されている。複数の第１収容部２１は、辺部４ａに沿う方向における端部２１ａ及び端部２１ｂを有している。厚さ方向Ｄ１から見て、端部２１ａの長さＬ１は、軸線方向に直交する方向における第１磁石２の長さＬ２以上であり、軸線方向における第１磁石２の長さＬ３よりも短い。

DESCRIPTION

TITLE OF INVENTION

MAGNET TYPE PLATE TOY

TECHNICAL FIELD

[0001] An aspect of the invention relates to a magnetic plate toy.

BACKGROUND ART

[0002] Conventionally, a magnetic plate toy which is magnetically connected to a connection object is known as an intellectual toy (for example, see Patent Literature 1). The magnetic plate toy described in Patent Literature 1 includes polygonal plate members. A magnet is provided inside the plate member along a side portion of the plate member. The plate member is magnetically connected to another magnetic plate toy by using a magnetic force of the magnet. According to such a magnetic plate toy, it is intended to raise children's creativity and imagination through play.

Citation List

Patent Literature

[0003] Patent Literature 1: Japanese Utility Model Registration No. 3161698

SUMMARY OF INVENTION

Technical Problem

[0004] In the above-described magnetic plate toy, another magnetic plate toy can be connected only to the side portion of the plate member where the magnet is disposed. For this reason, various connection

methods are required.

[0005] Therefore, an aspect of the invention provides a magnetic plate toy that enables various connection methods.

Solution to Problem

[0006] A magnetic plate toy according to an aspect of the invention includes a plurality of first magnets and a polygonal plate member. Each of the plurality of first magnets has a pillar shape and a magnetization direction orthogonal to an axial direction. The plate member includes a plurality of first accommodation portions respectively accommodating the plurality of first magnets. The plurality of first magnets are accommodated in the first accommodation portions so as to be movable along a side portion of the plate member and rotatable about a rotation axis along the axial direction and a rotation axis along a thickness direction of the plate member. The plurality of first accommodation portions are disposed along the side portion of the plate member so as to be separated from each other. The plurality of first accommodation portions include one end portion and the other end portion in a direction along the side portion. When viewed from the thickness direction, a length of the one end portion is equal to or longer than a length of the first magnet in a direction orthogonal to the axial direction and is shorter than a length of the first magnet in the axial direction.

[0007] In the magnetic plate toy, the first magnet is accommodated in the first accommodation portion of the plate member so as to be movable along the side portion of the plate member. For this reason,

the magnetic plate toy can be connected to another magnetic plate toy in a wide range of the side portion. The first accommodation portion includes one end portion in the direction along the side portion. When viewed from the thickness direction of the plate member, the length of one end portion is equal to or longer than the length of the first magnet in the direction orthogonal to the axial direction and is shorter than the length of the first magnet in the axial direction. For this reason, all of the pair of end portions in the axial direction of the first magnet can be disposed in one end portion of the first accommodation portion. However, all of the pair of end portions in the direction orthogonal to the axial direction of the first magnet cannot be disposed in one end portion of the first accommodation portion. A magnetic force of the end portion in the axial direction of the first magnet is weaker than that of the end portion in the direction orthogonal to the axial direction of the first magnet. Thus, even when all end portions in the axial direction of the first magnet are disposed in one end portion of the first accommodation portion, a connection with the first magnet at the adjacent first accommodation portions is not easy. Accordingly, it is possible to widen a range in which the first magnet is movable along the side portion while preventing the connection of the first magnets between the adjacent first accommodation portions. The first magnet is accommodated in the first accommodation portion so as to be rotatable about not only the rotation axis along the axial direction but also the rotation axis along the thickness direction of the plate member. For this reason, the magnetic plate toy can be connected to another magnetic plate toy also in a portion other than the side portion of the

plate member. With the above-described configuration, various connection methods can be enabled.

[0008] In the magnetic plate toy, when viewed from the thickness direction, a length of the other end portion may be equal to or longer than the length of the first magnet in a direction orthogonal to the axial direction and may be shorter than the length of the first magnet in the axial direction. In this case, all of the pair of end portions of the first magnet in the axial direction can be disposed at the other end portion of the first accommodation portion. However, all of the pair of end portions in a direction orthogonal to the axial direction of the first magnet cannot be disposed at the other end portion of the first accommodation portion. Accordingly, it is possible to further widen a range in which the first magnet is movable along the side portion while preventing the connection of the first magnets between the adjacent first accommodation portions.

[0009] In the magnetic plate toy, the first magnet may have a quadrangular pillar shape. In this case, the first magnet is connected to another magnetic plate toy at a planar side surface portion. For this reason, it is possible to improve a connection force as compared with a case in which the first magnet has a columnar shape and is connected to another magnetic plate toy at a curved side surface portion.

[0010] The magnetic plate toy may further include a second magnet and the plate member may further include a second accommodation portion which is disposed so as to be separated from the side portion and the plurality of first accommodation portions. The second magnet may be accommodated in the second accommodation portion so as to be

movable in a direction orthogonal to the thickness direction. In this case, the second magnet is accommodated in the second accommodation portion. Thus, various connection methods can be further enabled.

Advantageous Effects of Invention

[0011] According to an aspect of the invention, it is possible to provide the magnetic plate toy that enables various connection methods.

BRIEF DESCRIPTION OF DRAWINGS

[0012] FIG. 1 is a partially broken perspective view of a magnetic plate toy according to an embodiment.

FIG. 2 is a top view of the magnetic plate toy of FIG. 1 with an upper wall removed.

FIG. 3 is a bottom view of the upper wall of the magnetic plate toy of FIG. 1.

FIG. 4 is a partially enlarged view of FIG. 2.

FIG. 5 is a perspective view describing a method of connecting the magnetic plate toys.

DESCRIPTION OF EMBODIMENTS

[0013] Hereinafter, an embodiment will be described in detail with reference to the accompanying drawings. Furthermore, in the description below, the same or equivalent components will be indicated by the same reference numerals and a repetitive description thereof will be omitted.

[0014] FIG. 1 is a partially broken perspective view of a magnetic plate toy according to an embodiment. A magnetic plate toy 1 illustrated in

FIG. 1 is an intellectual toy for raising children's creativity and imagination through play. FIG. 2 is a top view of the magnetic plate toy of FIG. 1 with an upper wall removed. As illustrated in FIGS. 1 and 2, the magnetic plate toy 1 includes a plurality of (here, eight) first magnets 2, a second magnet 3, and a plate member 4.

[0015] The first magnet 2 and the second magnet 3 have a pillar shape. As an example, the first magnet 2 and the second magnet 3 have a quadrangular pillar shape of which a bottom surface is a quadrangle, in particular, a square pillar shape of which a bottom surface is a square. The first magnet 2 and the second magnet 3 are formed of, for example, the same material. The first magnet 2 and the second magnet 3 are, for example, neodymium magnets. The first magnet 2 and the second magnet 3 have magnetization directions orthogonal to the axial direction. That is, the first magnet 2 and the second magnet 3 are divided into two parts in a direction orthogonal to the axial direction. The first magnet 2 has an N pole portion which is disposed at one side in a direction orthogonal to the axial direction and an S pole which is disposed at the other side in a direction orthogonal to the axial direction. The dimension (volume) and the magnetic force of the second magnet 3 are larger than, for example, the dimension and the magnetic force of the first magnet 2. The schematic outer dimension of the first magnet 2 is, for example, 3 mm × 3 mm × 6 mm. The schematic outer dimension of the second magnet 3 is, for example, 3 mm × 3 mm × 8 mm.

[0016] The plate member 4 is a plate-shaped member having a uniform thickness. The plate member 4 has, for example, a polygonal shape

such as a triangular shape and a rectangular shape when viewed from a thickness direction D1 of the plate member 4. As an example, the plate member 4 has a rectangular shape, particularly, a square shape, when viewed from the thickness direction D1. The plate member 4 includes a plurality of (here, four) side portions 4a. Each side portion 4a is provided with a groove 4b which extends in the thickness direction D1 and has a U-shaped cross-section. The groove 4b is provided in a center portion of the side portion 4a in the longitudinal direction. The groove 4b may not be provided.

[0017] FIG. 3 is a bottom view of the upper wall of the magnetic plate toy of FIG. 1. As illustrated in FIGS. 1 to 3, the plate member 4 is hollow and includes a bottom member 5 and an upper wall 6. The bottom member 5 includes a bottom wall 7 which opposes the upper wall 6 and four side walls 8 which connect the upper wall 6 and the bottom wall 7. Each of the upper wall 6 and the bottom wall 7 has, for example, a square shape of which one side is 75 mm. Each of four side walls 8 has, for example, a rectangular shape of 75 mm × 6.5 mm. That is, the thickness of the plate member 4 is, for example, 6.5 mm and the plate member 4 has a square shape of which one side is, for example, 75 mm when viewed from the thickness direction D1.

[0018] The plate member 4 is formed of, for example, plastic such as ABS resin (acrylonitrile-butadiene-styrene copolymer). Since the plate member 4 is formed of plastic, the plate member 4 can be easily manufactured by, for example, injection molding. For example, the interest of children can be increased by using plastic of various colors as the material of the plate member 4. Since transparent plastic is used as

the material of the plate member 4, the inside of the assembled solid figure is visible. Accordingly, the interest of children can be further increased.

[0019] The plate member 4 is formed by covering the opening of the bottom member 5 by the upper wall 6. The bottom member 5 and the upper wall 6 are formed in such a manner that cylindrical portions 7a respectively provided at four corners of the bottom wall 7 are fitted to cylindrical portions 6a respectively provided at four corners of the upper wall 6. The cylindrical portion 6a is provided inside the cylindrical portion 7a and a metallic eyelet 9 is provided inside the cylindrical portion 6a. Accordingly, the bottom member 5 and the upper wall 6 are bonded to each other. The bottom member 5 and the upper wall 6 are also bonded to each other by high frequency welding or the like.

[0020] A plurality of ribs 11 to 13 are provided inside the bottom member 5. The plurality of ribs 11 to 13 are provided on the bottom wall 7. The plurality of ribs 11 to 13 extend along the thickness direction D1 of the plate member 4. The height of the plurality of ribs 11 to 13 (the length in the thickness direction D1) is the same as the gap between the upper wall 6 and the bottom wall 7. The front end portions of the plurality of ribs 11 to 13 are connected to the upper wall 6. The plurality of ribs 11 to 13 extend along the bottom wall 7. The rib 13 is provided inside the bottom member 5 in addition to the ribs 11 and 12. Accordingly, the strength of the plate member 4 is improved.

[0021] A plurality of substantially cylindrical portions 14 are provided on the bottom wall 7. The plurality of substantially cylindrical portions 14 are cylindrical members provided with slits extending in the

axial direction. The plurality of substantially cylindrical portions 14 have a C-shaped cross-section. The plurality of substantially cylindrical portions 14 are disposed so that the slits oppose the groove 4b. The plurality of substantially cylindrical portions 14 are fitted to a plurality of cylindrical portion 6b provided in the upper wall 6. The substantially cylindrical portion 14 is disposed at the outside and the cylindrical portion 6b is disposed at the inside. The substantially cylindrical portion 14 and the cylindrical portion 6b serve as guides which facilitate the assembly of the bottom member 5 and the upper wall 6. The strength of the plate member 4 is further improved by the substantially cylindrical portion 14 and the cylindrical portion 6b.

[0022] The plate member 4 includes a plurality of (here, eight) first accommodation portions 21 and a second accommodation portion 22. The plurality of first accommodation portions 21 respectively accommodate the plurality of first magnets 2. The plurality of first accommodation portions 21 are defined by the rib 11, the upper wall 6, the bottom wall 7, and the side wall 8. The plurality of first accommodation portions 21 are disposed along the side portion 4a of the plate member 4 so as to be separated from each other. A pair of the first accommodation portions 21 are disposed along each side portion 4a. The first accommodation portion 21 includes an end portion 21a and an end portion 21b in a direction along the side portion 4a.

[0023] The plurality of first accommodation portions 21 are disposed so that the end portions 21a or the end portions 21b of the pair of adjacent first accommodation portions 21 are adjacent to each other. In the pair of first accommodation portions 21 disposed along each side portion 4a,

the end portions 21b oppose each other with the groove 4b interposed therebetween.

[0024] FIG. 4 is a partially enlarged view of FIG. 2. As illustrated in FIG. 4, when viewed from the thickness direction D1 (see FIG. 1), a length L1 of the end portion 21a is equal to or longer than a length L2 of the first magnet 2 in a direction orthogonal to the axial direction and is shorter than a length L3 of the first magnet 2 in the axial direction. When viewed from the thickness direction D1, a length L4 of the end portion 21b is equal to or longer than the length L2 and is shorter than the length L3. For example, the length L1 is equal to the length L4.

[0025] A length L5 of the first accommodation portion 21 in a direction orthogonal to the side portion 4a (the side portion 4a provided with the first accommodation portion 21) is longer than the length L3. For example, a length L6 of the first accommodation portion 21 in a direction along the side portion 4a is longer than three times the length L3, longer than 1/4 the length of the side portion 4a, and shorter than 1/3 the length of the side portion 4a. The length L1 is, for example, 5 mm. As described above, the length L2 is, for example, 3 mm and the length L3 is, for example, 6 mm. The length L1 is, for example, 5 mm. The length L5 is, for example, 9 mm. The length L6 is, for example, 22 mm.

[0026] The length of the first accommodation portion 21 in the thickness direction D1 (the gap between the upper wall 6 and the bottom wall 7) is shorter than the length L3. Thus, in the first accommodation portion 21, the axial direction of the first magnet 2 is orthogonal to the thickness direction D1 and does not coincide with the thickness

direction D1. The length of the first accommodation portion 21 in the thickness direction D1 is, for example, 4.8 mm.

[0027] The plurality of first magnets 2 are accommodated in the first accommodation portion 21 so as to be movable along each side portion 4a of the plate member 4 and rotatable about the rotation axis along the axial direction and the rotation axis along the thickness direction D1. In other words, the first accommodation portion 21 is set to a size in which the first magnet 2 is rotatable about the rotation axes along the axial direction and the thickness direction D1.

[0028] As illustrated in FIG. 2, the second accommodation portion 22 accommodates the second magnet 3. The second accommodation portion 22 is defined by the rib 12, the upper wall 6 (see FIG. 1), and the bottom wall 7. The second accommodation portion 22 is disposed so as to be separated from the side portion 4a and the plurality of first accommodation portions 21. The second accommodation portion 22 has a square shape of which one side is, for example, 26 mm when viewed from the thickness direction D1 (see FIG. 1) and is disposed at a center portion of the plate member 4. Each corner portion of the second accommodation portion 22 opposes the center portion of each side portion 4a of the plate member 4 (see FIG. 1). Each corner portion of the second accommodation portion 22 opposes the groove 4b with the substantially cylindrical portion 14 interposed therebetween. Each side portion of the second accommodation portion 22 is connected to the cylindrical portion 7a by the rib 13. The second magnet 3 is accommodated in the second accommodation portion 22 so as to be movable in a direction orthogonal to the thickness direction D1.

[0029] The length of the second accommodation portion 22 in the thickness direction D1 (the gap between the upper wall 6 and the bottom wall 7) is shorter than the length of the second magnet 3 in the axial direction. Thus, in the second accommodation portion 22, the axial direction of the second magnet 3 is orthogonal to the thickness direction D1 and does not coincide with the thickness direction D1. The length of the second accommodation portion 22 in the thickness direction D1 is equal to, for example, the length of the first accommodation portion 21 in the thickness direction D1. The length of the second accommodation portion 22 in the thickness direction D1 is, for example, 4.8 mm.

[0030] The second magnet 3 is accommodated in the second accommodation portion 22 so as to be rotatable about the rotation axis along the axial direction and the rotation axis along the thickness direction D1. In other words, the second accommodation portion 22 is set to a size in which the second magnet 3 is rotatable about the rotation axes along the axial direction and the thickness direction D1.

[0031] In the magnetic plate toy 1 with the above-described configuration, the first magnet 2 is accommodated in the first accommodation portion 21 so as to be movable along the side portion 4a of the plate member 4. For this reason, the magnetic plate toy 1 can be connected to another magnetic plate toy in a wide range of the side portion 4a. In a state in which another magnetic plate toy is connected to the side portion 4a of the magnetic plate toy 1, another magnetic plate toy can be moved (slid) along the side portion 4a. Another magnetic plate toy may have the same configuration as that of the magnetic plate

toy 1 or may have a configuration different from that of the magnetic plate toy 1. As an example, another magnetic plate toy has the same configuration as that of the magnetic plate toy 1.

[0032] When viewed from the thickness direction D1, the length L1 is equal to or longer than the length L2 and is shorter than the length L3. For this reason, all of the pair of the end portions 2a (the bottom surface portion of the first magnet 2) of the first magnet 2 in the axial direction can be disposed at the end portion 21a of the first accommodation portion 21. However, all of the pair of the end portions 2b (the side surface portion of the first magnet 2) in a direction orthogonal to the axial direction of the first magnet 2 cannot be disposed at the end portion 21a of the first accommodation portion 21. The magnetic force of the end portion 2a is weaker than that of the end portion 2b. Thus, even when the entire end portion 2a is disposed at the end portion 21a of the first accommodation portion 21, the first magnet 2 is not easily connected to the first magnet 2 at the adjacent first accommodation portion 21. Accordingly, it is possible to widen a range in which the first magnet 2 is movable along the side portion 4a while preventing the connection of the first magnets 2 in the adjacent first accommodation portions 21.

[0033] The first magnet 2 is accommodated in the first accommodation portion 21 so as to be rotatable about not only the rotation axis along the axial direction but also the rotation axis along the thickness direction D1. For this reason, the magnetic plate toy 1 can be connected to another magnetic plate toy also in a portion other than the side portion 4a of the plate member 4. As described above, according to the

magnetic plate toy 1, various connection methods with respect to another magnetic plate toy can be enabled.

[0034] In the magnetic plate toy 1, when viewed from the thickness direction D1, the length L4 of the end portion 21b is equal to the length L1 of the end portion 21a. That is, the length L4 is equal to or longer than the length L2 and is shorter than the length L3. For this reason, the entire end portion 2a can be disposed at the end portion 21b of the first accommodation portion 21. However, the entire end portion 2b cannot be disposed at the end portion 21b of the first accommodation portion 21. Accordingly, it is possible to further widen a range in which the first magnet 2 is movable along the side portion 4a while preventing the connection of the first magnets 2 in the adjacent first accommodation portions 21.

[0035] In the magnetic plate toy 1, the first magnet 2 has a quadrangular pillar shape. For this reason, the first magnet 2 is connected to another magnetic plate toy at a planar side surface portion, that is, the end portion 2b. Thus, it is possible to improve a connection force as compared with a case in which the first magnet 2 has a columnar shape and the first magnet is connected to another magnetic plate toy at a curved side surface portion.

[0036] In the magnetic plate toy 1, the second magnet 3 is accommodated in the second accommodation portion 22 so as to be movable in a direction orthogonal to the thickness direction D1. The second accommodation portion 22 is disposed so as to be separated from the side portion 4a and the plurality of first accommodation portions 21. For this reason, another magnetic plate toy can be

connected to the magnetic plate toy 1 in a wide range of the upper wall 6 and the bottom wall 7 of the magnetic plate toy 1. Further, in a state in which another magnetic plate toy is connected to the upper wall 6 or the bottom wall 7 of the magnetic plate toy 1, another magnetic plate toy can be moved (slid) along the upper wall 6 or the bottom wall 7. At this time, the upper wall, the bottom wall or the side wall of another magnetic plate toy may be connected to the upper wall 6 and the bottom wall 7 of the magnetic plate toy 1.

[0037] The second magnet 3 is accommodated in the second accommodation portion 22 so as to be rotatable about not only the rotation axis along the axial direction but also the rotation axis along the thickness direction D1. Thus, for example, in a state in which the side portion of another magnetic plate toy is connected to the upper wall 6 or the bottom wall 7 of the magnetic plate toy 1, another magnetic plate toy can also be rotated. Thus, various connection methods can be further enabled.

[0038] FIG. 5 is a perspective view describing a method of connecting the magnetic plate toys. The groove 4b is not illustrated in FIG. 5. As illustrated in FIG. 5, a plurality of (here, three) magnetic plate toys 1 are connected to each other. According to the magnetic plate toy 1, not only the side portion 4a but also an arbitrary position of the upper wall 6 and the bottom wall 7 can be connected to another magnetic plate toy 1.

[0039] In the magnetic plate toy 1, even when the magnet of another magnetic plate toy is fixed to a predetermined position of the plate member, the first magnet 2 or the second magnet 3 rotates in accordance with the direction of the magnet of another magnetic plate toy. Thus,

the magnetic plate toy 1 can be connected to another magnetic plate toy without any repelling force.

[0040] Although the embodiment of the invention has been described, the invention is not limited to the above-described embodiment and may be modified in a range not departing from the spirit described in the claims or may be applied to another case.

[0041] The magnetic plate toy 1 may include at least two or more first magnets 2 and first accommodation portions 21. The magnetic plate toy 1 may not include the second accommodation portion 22. The number and the size of the first accommodation portion 21 and the second accommodation portion 22 can be appropriately adjusted in response to the shape of the plate member 4. Any one of at least the length L1 and the length L4 may be equal to or longer than the length L2 and shorter that the length L3. The other thereof may be shorter than the length L2, or may be equal to or longer than the length L3.

[0042] The first magnet 2 and the second magnet 3 may have a columnar shape or a triangular pillar shape. The first magnet 2 and the second magnet 3 may be formed of different materials. The dimension and the magnetic force of the first magnet 2 may be the same as the dimension and the magnetic force of the second magnet 3. The dimension and the magnetic force of the first magnet 2 may be larger than the dimension and the magnetic force of the second magnet 3. The second magnet 3 may not have a pillar shape. The second magnet 3 may have, for example, a disk shape. The magnetization direction of the second magnet 3 may be the same as the axial direction.

Reference Signs List

[0043] 1: magnetic plate toy, 2: first magnet, 3: second magnet, 4: plate member, 4a: side portion, 21: first accommodation portion, 21a: end portion, 21b: end portion, 22: second accommodation portion, D1: thickness direction.

CLAIMS

1. A magnetic plate toy including:

a plurality of first magnets each of which has a pillar shape and a magnetization direction orthogonal to an axial direction; and

a polygonal plate member that includes a plurality of first accommodation portions respectively accommodating the plurality of first magnets,

wherein the plurality of first magnets are accommodated in the first accommodation portions so as to be movable along a side portion of the plate member and rotatable about a rotation axis along the axial direction and a rotation axis along a thickness direction of the plate member,

wherein the plurality of first accommodation portions are disposed along the side portion of the plate member so as to be separated from each other and include one end portion and the other end portion in a direction along the side portion, and

wherein when viewed from the thickness direction, a length of the one end portion is equal to or longer than a length of the first magnet in a direction orthogonal to the axial direction and is shorter than a length of the first magnet in the axial direction.

2. The magnetic plate toy according to claim 1, wherein when viewed from the thickness direction, a length of the other end portion is equal to or longer than the length of the first magnet in the direction orthogonal to the axial direction and is shorter than the length

of the first magnet in the axial direction.

3. The magnetic plate toy according to claim 1 or 2, wherein the first magnet has a quadrangular pillar shape.

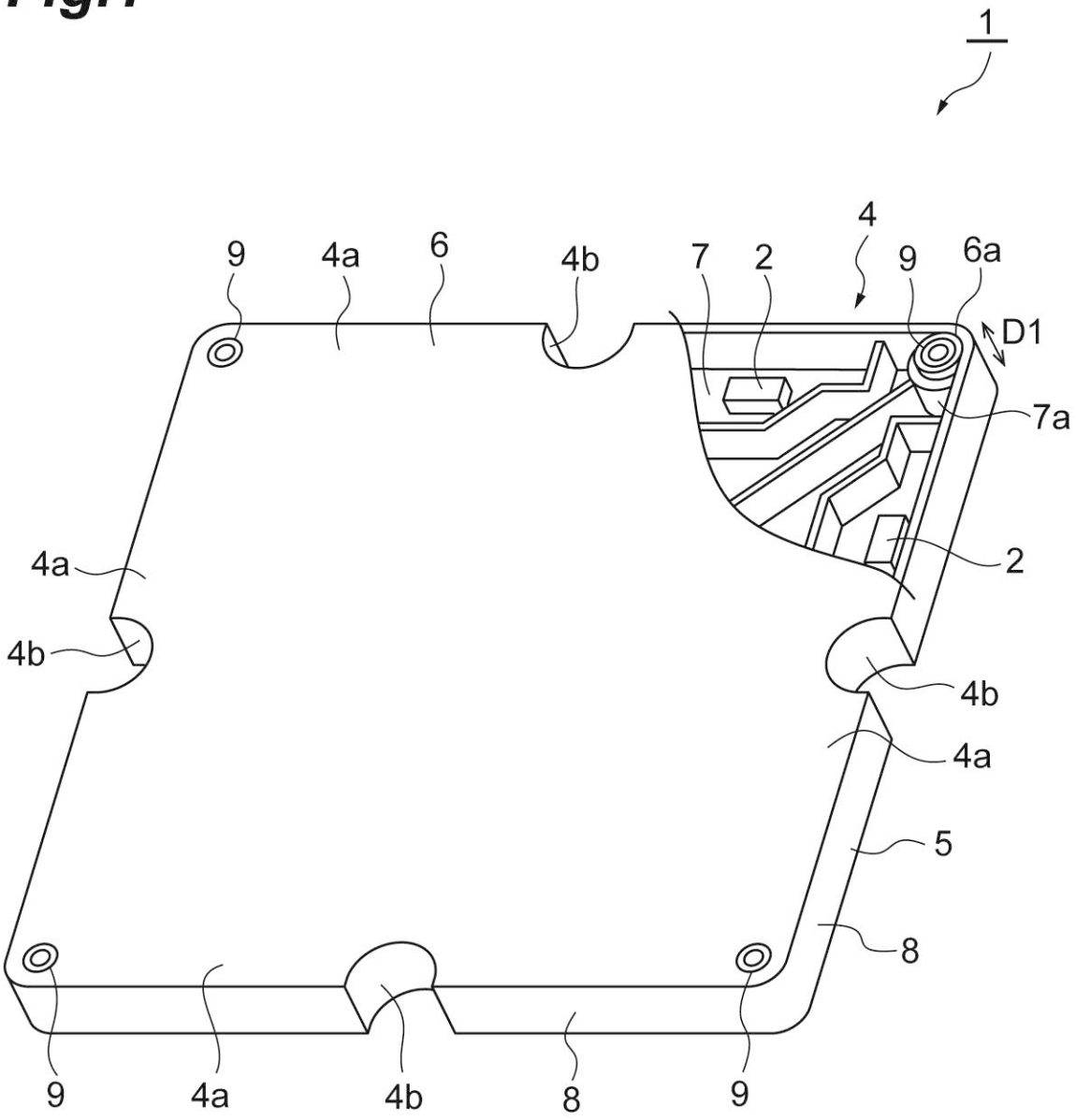
4. The magnetic plate toy according to any one of claims 1 to 3, further including:

a second magnet,

wherein the plate member further includes a second accommodation portion which is disposed so as to be separated from the side portion and the plurality of first accommodation portions, and

wherein the second magnet is accommodated in the second accommodation portion so as to be movable in a direction orthogonal to the thickness direction.

Fig.1



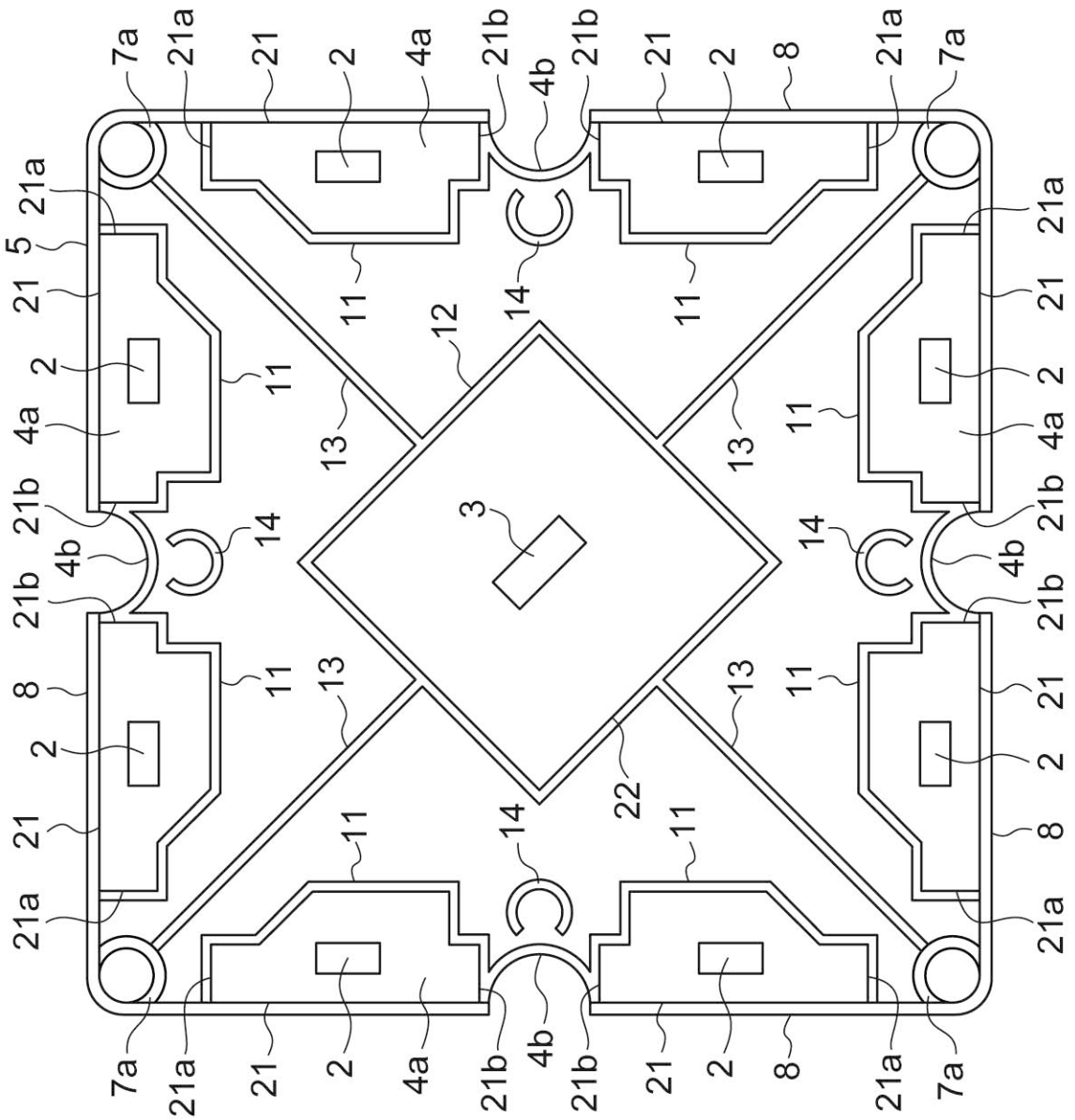

7a
21a
21
2
4a
21b
4b
21b
21
2
8
21a
7a
5
21a
21
2
4a
21b
4b
21b
8
2
21
21a
11
12
14
11
13
13
11
3
14
22
11
13
13
11

Fig.2

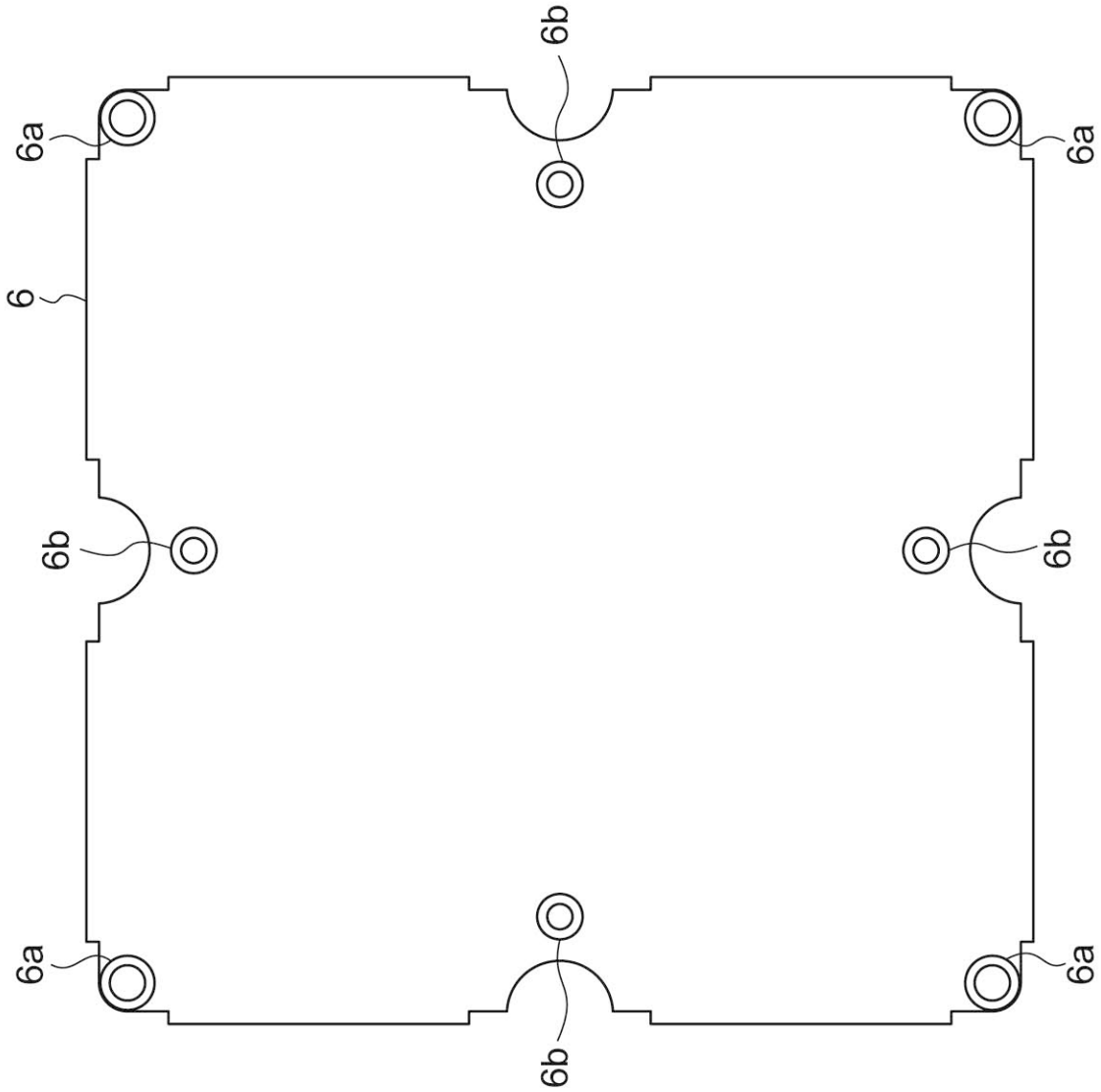


Fig.3

Fig.4

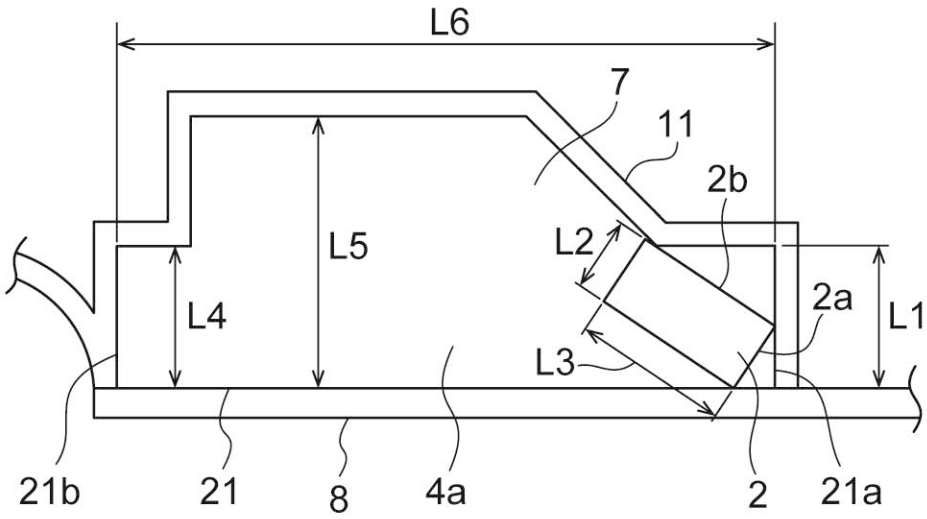


Fig.5