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(54) **BUILDING TOY BLOCK WITH A MAGNET**

(57) The present invention describes a building toy blocks comprising an outer part where all sides of the outer part are joining surfaces that are joined with joining surfaces of other building toy block joining surfaces, a soft inner part having pockets for diametrically magnetized cylindrical magnets that will freely rotate along the central axis in the magnet holding pocket. When assembling the building toy block after placement of the inner part with magnets into the outer part the housing of outer part is closed permanently with the lid to avoid disassembling.

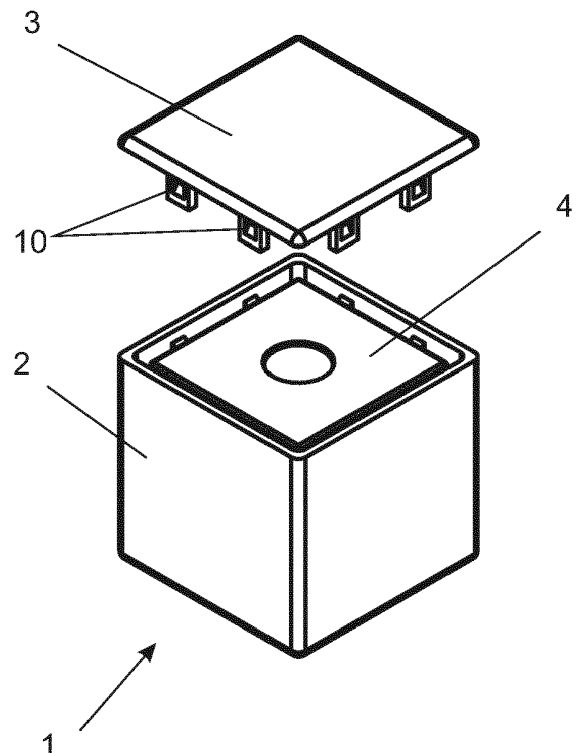


FIG 1

Description

Technical field

[0001] The present invention relates to building toy blocks, especially the embodiments of the invention relate to building toy blocks made of plastic having internally disposed permanent magnets.

Technical background

[0002] Building sets that consist of simple blocks and tiles provide children with engaging play. Stacking of blocks develops spatial reasoning, decision making and understanding the cause and effect relationship. It also encourages creative play and is therefore among one of the first toys recommended for children as young as seven months (<http://www.naeyc.org>). Since they provide open-ended activity, they are among toys to play for years to come.

[0003] In addition to classic wooden blocks and Lego Duplo® series, there are several magnetic construction toys on the market (e.g., sets by Magna-Tiles®, Magformers®, Geomag™, Build&Imagine™, Tegu®, etc.,). They give an alternative way to connect pieces, adding the sensation of magnetic pull force to the play.

[0004] According to their general shape and way of connection, one can divide the magnetic construction toys as follows:

- Sets made up mostly of spheres and sticks (e.g., sets by Better Builders™, Smartmax®, Geomag™ US 6566992C1, EP1080476) where magnetic parts (ends of sticks) connect to the metal intermediate (spheres) allowing construction of the net like structures.
- Sets comprised of flat, substantially planar tiles of various forms that have either moving or static magnets near the edges or corners. The tiles can be either full (e.g., sets by Magna-Tiles®, Build&Imagine™ WO2015123119) or have openings in the central part (e.g., sets by Magformers® US7154363, Powerclix®, Geosmart™). They connect to each other edge-to-edge or via corners which allows building of three-dimensional structures from two-dimensional planes.
- Three-dimensional blocks of various shapes where blocks are either from the non-extrudable material, such as wood, or from extrudable plastic materials, and hold permanent magnets within.

[0005] Play with the blocks of the latter category is most similar to the classic building and suits therefore young children. In the document WO2011/037290, 31.03.2011, KIM, Young Don, a solid/wooden toy block is described having a structure for mounting magnets. The wooden (non-extrudable) block has receiving cavity defined in said block for magnet, wherein the magnet is mounted

and covered with a cap. The cap has catching projections formed on an outer surface, and a projection receptacle is formed in a wall surface of the receiving cavity. In the solution described, the places covered with the cap where the magnets are hidden can be seen. Therefore, there is a problem with safety as the cap can break or open, and the magnet may fall out which is dangerous to a child who can put the magnet into the mouth and swallow.

[0006] In another example of non-extrudable blocks, static magnets are mounted into a solid wooden block (Tegu® WO2010111189) such that the number of faces that exhibit a north and a south polarity is equal. If the two faces form an N-S pair, they can be joined. In another half of the cases (N-N and S-S pairs) the blocks repel. This configuration allows to learn the magnetic pull and push forces alongside playing with blocks of traditional shape (cubes, 3D rhomb, rectangular blocks, etc.). However, such described method of non-extrudable blocks is limited in the flexibility of magnet placements when more than two rows of magnet holding pockets are desired on each face.

[0007] Several three-dimensional blocks of extrudable (plastic) material where all the sides connect to each other and that are substantially hollow are currently on the market. Recently, Geomag™ released a set of identical cubes where one can always join the faces to each other (Magicube™, Patent Pending). It provides a truly magic three-dimensional cube that gives freedom to connect the pieces both vertically and horizontally. Similarly, magnetically-connecting building blocks from Geomatrix™ are available (Patent Pending).

[0008] The magnets within three-dimensional blocks are either spherical, axially magnetized and flip, or diametrically magnetized and rotate along the central axis. The extrudable plastic blocks have complicated inner structures or need a separate cap (lid) to enclose each magnet separately into the block. It makes the blocks time consuming to assemble and in case of complex inner structures, may also restrict the construction of small blocks of different (irregular) shapes where magnet to be fitted is too big to be accommodated together with inner structures which also require adequate space.

[0009] To follow safety requirements for toys, especially for children from 6 months to 3 years the construction of building toy block must have as minimum as possible lids for compartments of magnets (or no parts that fit into safety hazard tester) which can be removed by a child accidentally or in purposefully as the child would like to see what is under the lid. In this way, the magnets may drop out of their compartments, and the child can put magnets into the mouth and swallow them inadvertently. It is also desirable to have a generally applicable structure for the inside of blocks of various shapes that is easy to design, fits effortlessly to the inside of the block and has the flexibility to use any number of desired pockets in any region of the block.

Disclosure of invention

[0010] The present invention relates to the building toy blocks where all the faces of the block can connect with the faces of other blocks or have a specific fit in only one or certain defined number of configurations relative to each other. Although many patents are granted that describe ways to make blocks with mounted magnets, they are often restricted by the complexity of internal structures to produce blocks with flexible magnet arrangement and may require a considerable effort of assembly.

[0011] To avoid drawbacks of the extrudable toy blocks known and to offer better solutions the present invention describes a straightforward way to produce blocks where all the faces or/and edges connect to each other or have a specific orientation in which they can or cannot be combined. It consists of (one) simple inner part that follows the general shape of the outer part and that holds all the magnets simultaneously in place. The inner part is manufactured of a soft, light, flexible plastic residue, polymer foam, rubber resin or copolymer (polythene, EVA foam, residues or resins with metal powder, etc.) and has magnet holding pockets for each face (edge, or region) to be later attached. The positioning of the magnet holding pockets (and later magnets) is not restricted to the central area or edges of the face, and the number of magnets per face or edge can vary according to the desired configuration. The soft inner part is light, easy and cheap to produce, for example by injection or compression moulding, and the magnet holding pockets provide mild cushioning effect due to the material choice of the inner part: they do not make so much noise, especially when flipping magnets are used. In case the magnets should be splintered, they will still be in the same pocket and cannot escape to the hollow parts of the object. If the magnetic fields of nearby magnets interfere with magnets desired movement, a separate (iron or steel) piston may be placed into (some or all) of the magnet holding pockets to modify the magnetic field flux. The inner part material may contain iron powder to make it stronger, modify magnetic field flux and help magnets to stay in place prior transferring to the outer part.

[0012] The magnets placed in the magnet holding pockets are diametrically magnetized (or have another number of alternating magnet poles) cylindrical or disc magnets, or spherical magnets that will rotate along their central axis. The blocks can be joined as the magnet from one face (or edge or region) of the first block nears the second magnet of the second block. Since they both are free to rotate along the axis, they adjust the upper surfaces so that the N and S portions of one magnet align with the opposite poles of the second one. When the magnets are diametrically magnetized, they have a strong magnetic field on the sides. When placing these magnets into the soft pockets of the inner part (if the part is in according size compared to the magnet strength), the magnets will hold each other in place in the magnet holding pockets. It allows transferring the inner part to-

gether with all the magnets directly inside the outer part without any need for separate caps for each magnet holding pocket.

[0013] Outer part that is of the desired shape (cube, triangle, rhomb, arc part, etc.). It is made of separated (preferably two) parts to be connected permanently together. The outer part will serve as a simultaneous cap/lid for all the magnets held by the inner part. The production of outer part is not limited by the need to fit special inside structures. One outer part can be used to fit either one inner part with one or varying configurations of the magnet holding pockets or can be used to fit (several) inner parts with different placements of magnet holding pockets.

[0014] Compared to previous complex structures, the use of soft resign in the inside of the blocks allows for more straightforward design and production/assembly of the parts. No folding or fitting of the complex inside structures is needed. The same outer component can be used with different inner parts regarding magnet holding pocket placements. Or same outer and inner part can be used with varying arrangements of magnets into only some pockets of the same inner part. Compared to previous manufacturing methods where the parts have been solid inside, our method does not require a separate cap or lid for each magnet, and the outer part can be sealed permanently and safely to hold all the magnets inside. The inside is made of soft and light residue which will position the magnets correctly and provides cushioning effect in case of severe damage to the block. It also provides structural support for the outer part.

A brief description of the drawings

[0015] Embodiments of the present invention are described in detail with references to the accompanying drawing where in:

Fig. 1 is shown cube or rectangular object according to one embodiment of the present invention;

Fig. 2 is shown inner part of the toy building block according to the present invention, the pockets for permanent magnets and magnets are also shown;

Fig. 3 is shown the side view of the toy building block;

Fig. 4 is shown cross-section view along the line A-A in fig. 3 to illustrate placement of the inner part in the housing and magnets; magnetic field lines show how the magnets hold each other in place in the inner part.

Fig. 5 is shown section view along the line B-B in fig. 3 to illustrate the placement of side magnets in the inner part of the building toy block;

Fig. 6A is shown an alternative embodiment of the

building toy block according to the present invention to illustrate the structure of the rectangular block which height is many times less than its length;

Fig. 6B are shown similar inner parts with through holes arranged next to each other in several rows and columns which enables to form a plate like blocks (block height is many times less than its width or length) with different width and length which is greater than the length of the one inner part;

Fig. 7 is shown the top view of the rectangular building toy block in fig. 6 without the lid to illustrate the placement of several one sized inner parts in the housing of the building toy block;

Fig. 8 is shown the cross-section view of the rectangular toy block in fig. 6 with a lid to illustrate the placement of inner parts and magnets in them.

Fig. 9-11 show different forms (pyramid, triangle, arc or shape of animal, toy, letter, or another shape, for example, snowman) of building toy block according to the present invention or cubic and round figure;

Fig. 12 is shown an alternative embodiment of the block comprising two identical outer parts which will be glued or welded permanently to each other after placement the inner part with magnets into one outer part. In this way, a more resilient block can be obtained which is more resistant to opening or breaking apart.

Fig. 13A is shown an alternative embodiment of the inner part according to the present invention where multiple magnet holding pockets are formed for example on each side of the block. When the toy block is manufactured, all or only necessary number of pockets can be used for placement of magnets in final block.

Fig. 13B are shown alternative plate-like inner parts with magnet pocket having a base, these inner part can be placed next to each other like in the embodiment shown in fig. 6B to manufacture plat-like toy building blocks;

Fig. 13C is shown alternative embodiment of arrangement of inner parts described in fig. 13B where inner parts can arranged to each other for example as cubic;

Fig. 14 is shown the partial view of building toy block having inner part with multiple magnet holding pockets and magnets;

Fig. 15A to 15E are shown toy blocks with the different final (connection) fit properties while the pro-

duced outer and inner parts are identical. In fig. 15A is shown two blocks A and B, in fig. 15B is shown an arrangement where blocks A and B can always be connected and can rotate relative to each other (in the figures the diametrically magnetized magnet or spherical magnet is marked with a black dot); fig. 15C shows the magnet arrangement where blocks can be connected in only one position relative to each other; fig. 15D shows arrangement where blocks can be connected in two positions relative to each other; fig. 14E shows arrangement where blocks can be combined in any of four ways so that the corners align, but blocks cannot rotate to each other as in fig 15B.

Fig. 16 is shown top view and side view of the toy building block with round shape, with broken line are shown arrangement of pockets form magnet and magnets;

Fig. 17 is shown alternative toy building block with cross shape, the section view shows the inner part and magnet in the magnet holding pocket;

Fig. 18 is shown section view of alternative toy building block with through opening, shown are inner part and magnets in the magnet holding pocket formed in the inner part.

A detailed description of embodiments

[0016] In fig. 1 is shown building toy block 1 according to one embodiment of the invention. The shape of the building toy block 1 is a cube with rounded edges, which comprises an outer part made of two parts, a housing 2 and a lid 3, to be connected permanently after assembling the building toy block. In some cases, the housing and the lid can be symmetrical, as in Fig 12. Into the outer part is placed an inner part 4. The inner part 4 follows the general shape of the outer part, and the inner part is made of soft residue (polythene, EVA foam, etc.). The block may house one inner part (fig. 1) or several identical (fig. 6) or non-identical inner parts. The inner part 4 has magnet holding pockets 5 for each face (edge, or region) to be later attached. The soft inner part 4 is light, easy and cheap to produce and the magnet pockets 5 provide soft cushioning effect (they do not make so much noise, especially when compared to flipping magnets). The positioning and number of magnet pockets 5 per face are not restricted and can vary according to the desired outcome. For example, see fig. 13 where to the inner part are formed multiple magnet holding pockets. In case the magnets 6 should be splintered, they will still be in the same pocket and cannot escape to the hollow parts of the object, i.e., the soft inner part 4 holds all the magnets simultaneously in place.

[0017] Step 7 is formed for fixing elements of the lid in one side (top) of the inner part so that dimensions of top

part 8 of the inner part are smaller than the dimensions of the remaining part 9 (or lower part) of the inner part. The height of the top part 8 and the width of the step 7 correspond to the dimension of fixing means 10 of the lid 3. The fixing means 10 are formed for example as projections with clicking element which will enter into the corresponding cavity formed in the upper part of the housing. If the clicking element enters into the cavity, the lid will click into fixed position, and the housing will be closed in the way that it is not possible to remove the lid and the building toy block is as one part. For the small children, it is very difficult to open said lid without breaking the clicking elements. If the outer part is closed without inner fixing means (e.g., with gluing, sonic welding, etc.) or other structural supports are not present in the outer part, the inner part does not need to include a step or other corresponding structural modifications. In an alternative embodiment, the outer part has two identical parts (fig. 12), where the outer part is divided equally into two similar parts (no lid as described below). After placement of the inner part into one outer part the second outer part is attached and welded or glued to the first part. That way a more resilient block can be obtained where no point or line where to break two similar outer parts apart can be easily seen which makes the block safer. It is especially important for small children who discover the world and try to open every toy to see what is inside.

[0018] The permanent magnets 6 placed in the magnet pockets 5 are diametrically magnetized (or have another number of alternating magnet poles) cylindrical magnets or spheres that will freely rotate along their central axis. In some arrangements, magnets can also be axially magnetized and no rotation is needed. The building toy blocks 1 can be joined as the magnet 6 from one face (or edge or region) of the first building toy block nears the second magnet 6 of second building toy block. Since both magnets 6 are free to rotate along the axis, they adjust the upper surfaces so that the N and S portions of one magnet align with the opposite poles of the second one. If the magnets are diametrically magnetized, they have a strong magnetic field on the sides. When placing these magnets 6 into the soft magnet pockets 5 of the inner part 4 (if the part is in according size compared to the magnet strength) the magnets will hold each other in place (fig. 4). This allows transferring the inner part 4 together with all the magnets 6 directly inside the outer part, without additional means to fix the magnets.

[0019] In different embodiments, the outer part is of the desired shape (cube, triangle, rhomb, arc part, etc., see fig. 6 to fig 11). As described above the outer part is made of two parts 2, 3 (housing and lid) to be connected permanently together. The outer parts will serve as a simultaneous cap/lid for all the magnets 6 held by the inner part 4. The production of outer part is not limited by the need to fit special inside structures. In the alternative embodiment shown in fig. 12 the outer part is made of two identical parts 21 and 31, i.e., both parts have three walls and parts are glued or welded together when

building toy block is manufactured. Due to said simple design and soft inner part, which fills essentially the entire space inside the toy block, there is no need for special ribs or reinforcement elements in first or second parts of the housing.

[0020] The inner part of the building toy block can be in the general shape of the outer part to be fitted into outer part. In an alternative embodiment shown in fig 6 to 8, the inner part 41 can be with standardized shape and dimension so that several inner parts can be fitted in one outer part, for example the same inner part can be used in substantially planar blocks (see fig. 6B) and three-dimensional blocks as well (see fig. 13B, 13C). In case of three-dimensional blocks all edges of the inner part are formed or cut at an angle 45 degrees so that the inner parts can be folded together to form three dimensional inner part which is empty inside. In this way, the production of the building toy blocks can be standardized. In fig. 6A is shown a plate-like or bar-like (rectangular building toy block which height is many times less than its length) building toy block where four inner parts (of the same size) are placed into outer part. In this way, it is possible to assemble different plate-like building toy blocks, for example having four inner parts (2x2), nine inner parts (3x3) or two inner parts (1x2) or like in fig. 7 four inner parts (1x4). The combination is not limited and can vary according to the set of the building toy blocks manufactured. All inner parts used in plate-like blocks have pockets for magnets which are generally in this embodiment holes through the inner part (see fig 8), but in some cases can also be pockets with the solid base.

[0021] In alternative embodiments, where building toy block has an arc shape, the inner part can be formed as one piece with a necessary number of pockets for magnets or again, the inner parts can be standardized in the way that arc shape building toy block contains a necessary number of inner parts to form an arc shape.

[0022] In an alternative embodiment the toy building block has round shape (see fig. 16) having thickness less than diameter of the round shape. With broken lines are illustrated arrangement of pockets for magnet and magnets. In yet another alternative embodiment the toy building block has cross shape, the section view in fig 17 shows the inner part and magnet in the magnet holding pocket. In yet another alternative embodiment the toy building block may have a through opening as illustrated in fig 18. The inner part and magnets in the magnet holding pocket formed in the inner part are placed into outer part or housing. All these alternative embodiments show that when using soft inner part with magnet holding pockets according to the present invention and modern day 3D-printing possibilities the toy building block can be manufactured with any kind of shape. There is no restriction to the internal support elements because soft inner part fills the outer part or housing of the toy building block and after placement into the outer part, the outer part can be closed in the non-opening way making the toy building block safe.

[0023] The inner part 4 can have many magnet-holding pockets 5, all or only some of which are filled with magnets in each particular case, to achieve desired fit among separate parts as in fig 15A-15E.

[0024] The alternative embodiment shown in fig. 13 and fig. 14 where the inner part comprises multiple pockets for magnets, allows using the same outer and inner parts to manufacture blocks that can be connected differently to each other. In the alternative embodiments the inner part with multiple pockets for magnet can be manufactured as plate-like (thickness is less than side length), and it is possible to arrange several inner part in one outer part or housing of the toy building block (see fig. 13B). In addition with the plat-like inner parts can be formed three dimensional inner part (see fig. 13C) which can then inserted into the three dimensional toy building block.

[0025] By filling the same inner part with different combination of magnets with varying magnetization directions, blocks with distinct properties are made. This gives many opportunities and possibilities to make blocks with logical tasks to children. In fig 15A-E examples of such blocks are shown.

[0026] In fig. 15B is shown the arrangement of magnets where only one middle pocket is filled with diametrically magnetized disc or spherical magnet. This arrangement enables to turn connected blocks relative to each other so that the corners may or may not align. In other arrangement shown in fig. 15C two of middle side pockets are filled with axially magnetized magnets in the way that into one pocket is placed for example magnet with N pole side up and into the second pocket is placed magnet with S pole side up. In this arrangement, blocks can be connected only in one configuration where the N and S poles align (sides 1-4 and 2-3). In other orientations, the blocks will not be held by the strong magnetic force. Or on to the first block, two blocks side by side can be connected in the way that the N pole of one magnet connects to the S pole of the first block and the S pole of the second magnet of another block connects to the first blocks N pole magnet. In yet another arrangement shown in fig. 15D two middle side pockets are filled with diametrically magnetized (or spherical) magnets and two blocks can be connected in two positions to each other: sides 2-3 and 4-1 aligned or sides 2-1 and 4-3 aligned. In other two orientations, the blocks won't be held strongly together. In the arrangement shown in fig. 15E all corner pockets are filled with diametrically magnetized (or spherical) magnets and blocks can be connected in any of four ways so that the corners align but the blocks cannot smoothly rotate relative to each other as in fig. 15B. It also allows to stack blocks, so that upper blocks are shifted $\frac{1}{2}$ of the length relative to the lower block.

[0027] In the drawings in fig. 15C to 15E, the numbers 2, 4, 6, 8 indicate sides of one block A and numbers 1, 3, 5, 7 indicate sides of the second block B. In this way, the arrangement of the blocks to each other are more clearer. For example, in fig. 15E two blocks can be con-

nected in the way where side 2 of one block and side 1 of the other block coincide in one plane, in the same way, sides 4-3, 6-5 and 8-7 coincide in one plane.

[0028] For the person skilled in the art, it is clear that by using the concept of the building toy block according to the invention where soft inner part that has magnet holding pockets for permanent magnets is placed into housing, different combination of the magnets placed into multiple pockets of the inner parts creates possibilities for different logical tasks and teaching.

Examples of logic tasks:

Fig 15C

[0029] The blocks can be stacked in one orientation only. It is a useful property when the blocks either have an irregular shape and should be fitted in one direction to form together a certain shape. Or the (regular) blocks have pictures, letters, numbers, words etc., printed on the walls that should be aligned, such as in puzzles, sentences, words, functions, etc. It allows making blocks that help teach logic pairs to young children. For example, block A has 4 general symbols printed on four connected walls: a circle, a rectangle, a triangle, a wave. Block B has 4 pictures of everyday objects printed on four connected walls: sun, rectangular cookie, spruce, sea wave. The blocks can be connected to each other via other two walls with no pictures, where magnets are mounted accordingly. This way, only pairs: circle-sun, rectangle-cookie, triangle-spruce, wave - sea wave can be connected. Other combinations will repel or not stay together, helping to teach the logic pairs. Same way all sorts of concepts (synonyms, antonyms, mathematical functions, etc.,) can be tutored.

Alternative examples:

[0030]

Example: Spring- summer-autumn-winter: what do you do when?

Block A: seasons: Blooming tree - Green tree - Fruits on the tree/Colorful tree - Tree without leaves

Block B: picture of an activity: Catching a butterfly - Swimming - Mushroom picking - Skating

Example: Teaching the numbers

Block A: numbers 1 - 2 - 3 - 4

Block B: one cookie - two cookies - three cookies - four cookies

Example: Teaching the shapes

Block A: numbers 3 - 4 - 5 - 6

Block B: triangle, tetragon, pentagon, hexagon

Block A: Circle - Wave - Triangle - Square

Block B: Ball - Sea wave - Spruce - Window

Block B: Apple - Bean - Pear - Fruit box

Etc.

Fig 15D

[0031] Compared to fig 15C, this arrangement allows to align blocks in two positions, but not in all four. Again, it can be useful when connecting irregular shapes or (regular) shapes with pictures, symbols, mathematical functions, logic pairs, etc. It also allows making toy blocks such that only specific pairs fit together so that combinatoric tasks can be made. For instance, with a rectangular block, following combinatoric game can be designed. The block A would have on each of four connected sides 4 symbols (abcd defa, abce, and defb) and block B would have on each of four connected sides 2 symbols (ab, de, bc, ef). The blocks can be connected to each other via remaining two walls, where magnets are mounted accordingly. This way, the blocks can be attached in two directions in which two symbols from block B would match the symbols from block A (abcd-ab, defa-de, abce-bc, defb-ef or abcd-bc, defa-ef, abce-ab, defb-de). But not in directions in which only one symbol from block B would match symbols of block A. Combinatorial games involving all sides of the block in only certain positions can be devised.

Alternative examples:

[0032]

Example: what goes together?

Block A: Smiling face - Sad face - Sun and beach - Mop and cleaning up

Block B: A child building a sand castle - Ice-cream on the floor - A child is swimming, playing in the water - Messy room

Example: what is in the box?

Block A: Round shaped blue gift box - Rectangular red gift box - Round shaped green gift box with a bow - Rectangular yellow gift box with a bow

Block B: A ball - A car - Round sea shell - Locomotive

[0033] Building toy blocks are valuable tools for teachers in school and kindergarten. Toy blocks manufactured according to the present invention give more opportunities how to teach children with special needs. Using the same inner part and same outer part, but filling it differently with the magnets, gives different properties to the blocks. Combined with printed symbols, a new game in each case can be devised.

10 List of elements:

[0034]

- 1 - building toy block
- 2 - housing
- 3 - lid
- 4 - inner part
- 5 - magnet holding pockets
- 6 - permanent magnet
- 7 - step
- 8 - top part of the inner part
- 9 - remaining part of the inner part
- 10 - fixing means
- 41 - alternative embodiment, inner part
- 21 - first part of the block, identical to the second part of the block
- 31 - second part of the block, identical to the first part of the block

Claims

1. A building toy block (1) comprising an outer part having housing (2) and lid (3) where all sides of the housing and the lid are joining surfaces that are joined with joining surfaces of other building toy block joining surfaces, an inner part (4) having at least one pocket (5) for magnet (6), **characterized in that** the inner part (4) made of soft polymer, copolymer foam material or resin and having pockets for magnets is placed in the outer part housing and covered permanently with lid and the magnet (6) is the diametrically magnetised cylindrical magnet that will freely rotate along central axis in the magnet holding pocket.
2. The building toy block according to claim 1 **characterized in that** the outer part having any desired shape (cube, bar, triangle, pyramid, arc, etc.,) comprises the inner part made at least in one piece and having a plurality of pockets for magnets.
3. The building toy block according to claim 1 **characterized in that** the outer part having essentially flat shape where the height is shorter than the length (bar, arc, circle, etc.,) comprises number of inner parts with similar dimension to fill inner space of outer part and each inner part has one or more pocket for magnet in the form of through hole.

4. The building toy block according to claim 1 **characterized in that** the lid (3) has a fixing means and the housing has in the upper part protrusions for hooking the fixing means of the lid for connecting lid permanently to the housing. 5
5. The building toy block according to claim 1 **characterized in that** the lid of the outer part is permanently glued or welded to the housing of the outer part after placement of the inner part with magnets into outer part. 10
6. The building toy block according to claim 1 **characterized in that** into the inner part multiple pockets are formed for magnets in which are placed diametrically or axially magnetized cylindrical or disc magnets or spherical magnets or magnets of any shape. 15
7. The building toy block according to claim 6 **characterized in that** the magnets are placed only into some pockets to achieve desirable connection properties. 20
8. The building toy block according to claim 1 **characterized in that** the toy block is formed from two or more identical outer parts having identical shape and size. 25

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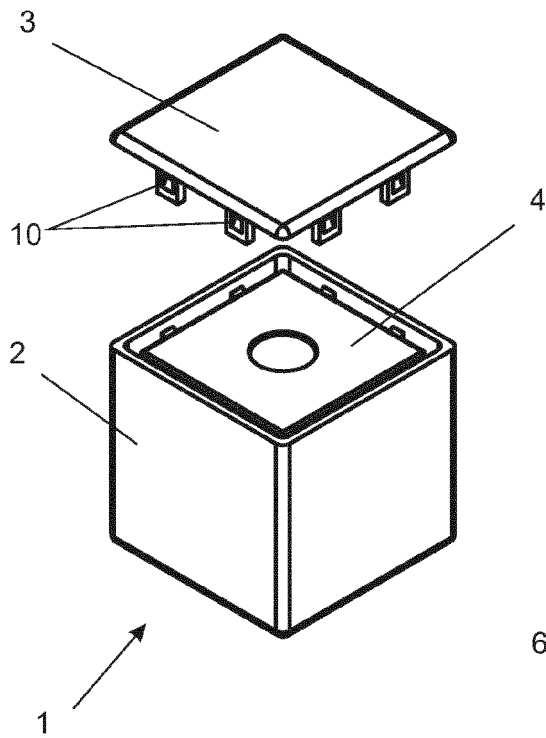


FIG 1

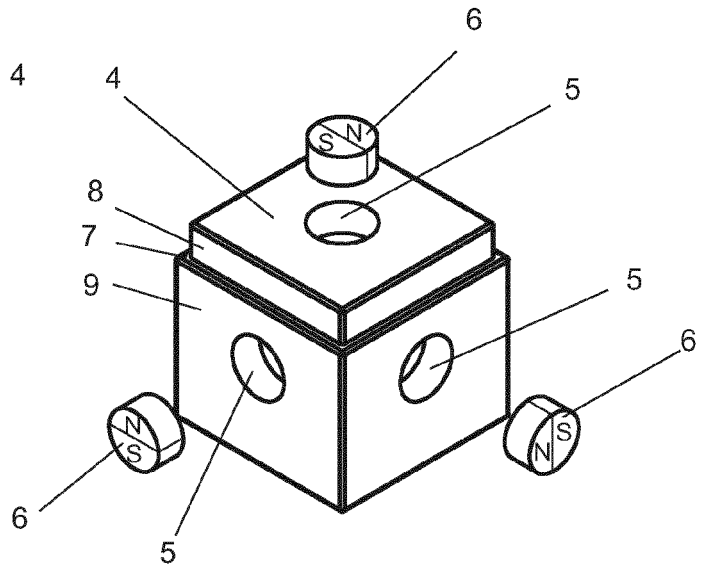


FIG 2

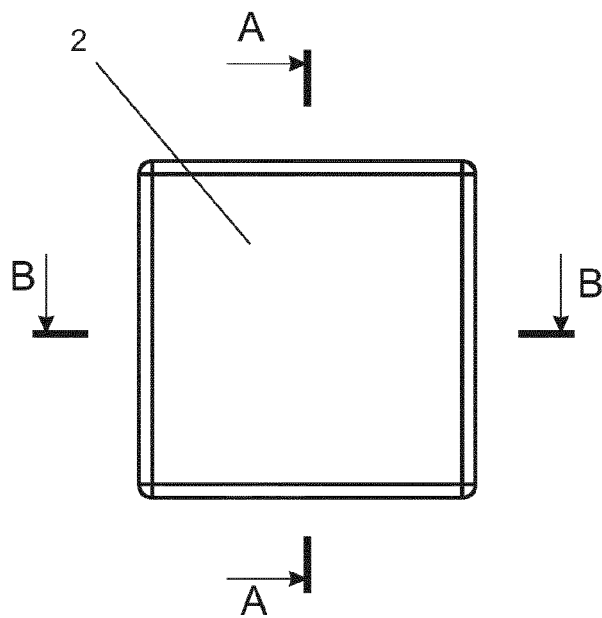


FIG 3

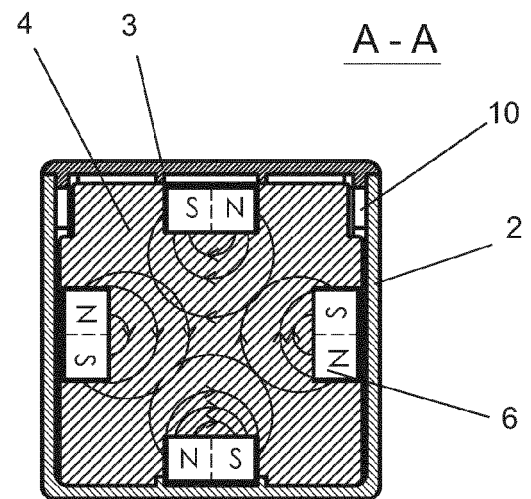


FIG 4

B - B

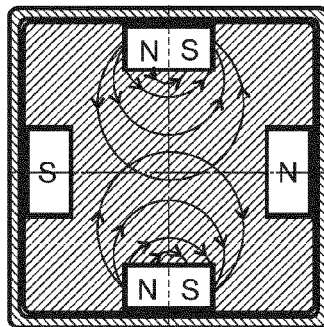


FIG 5

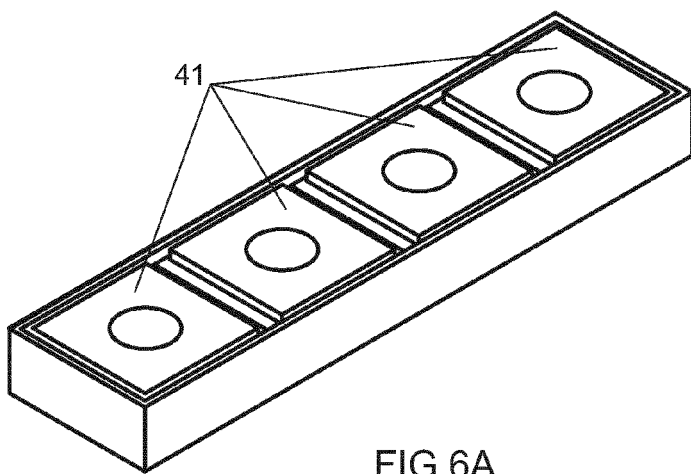


FIG 6A

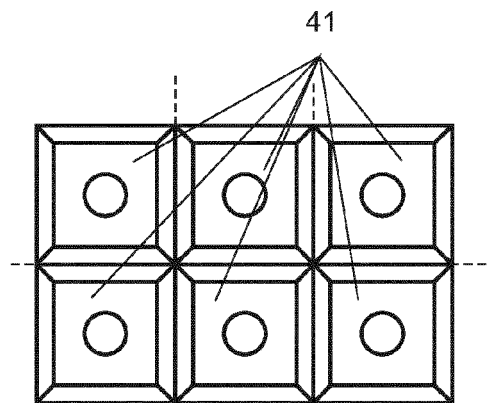


FIG 6B

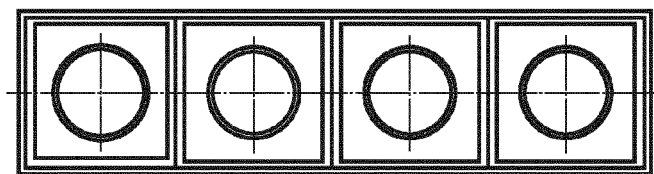


FIG 7



FIG 8

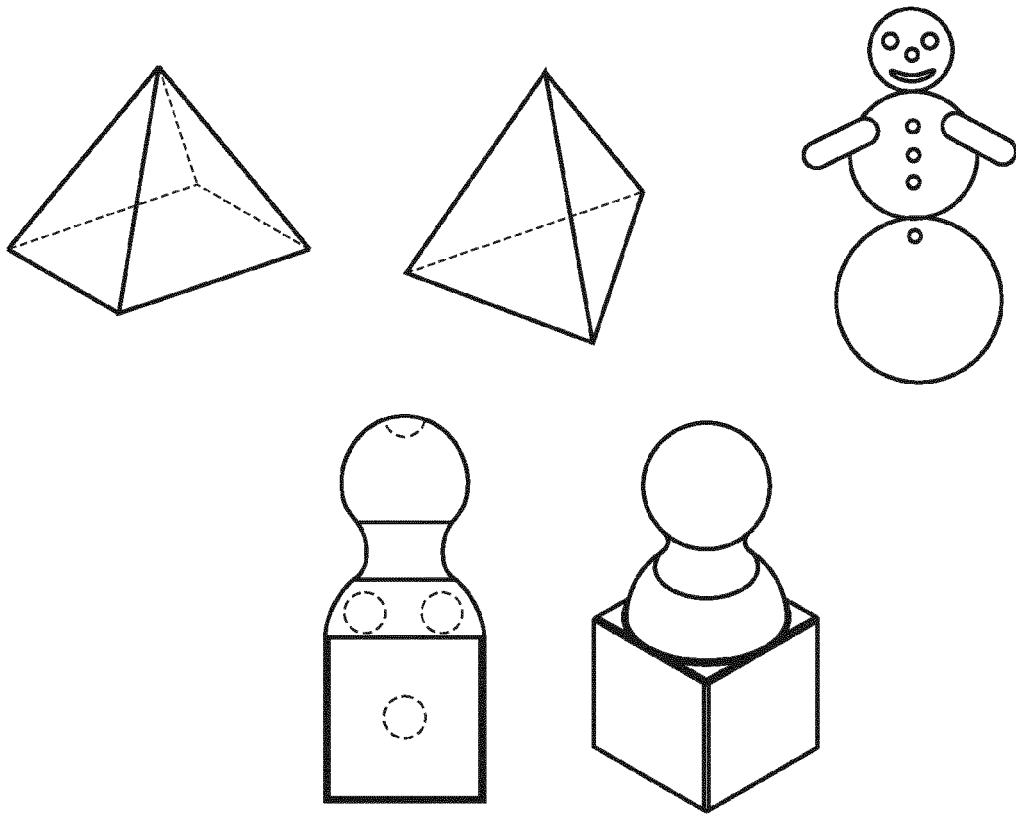


FIG 9

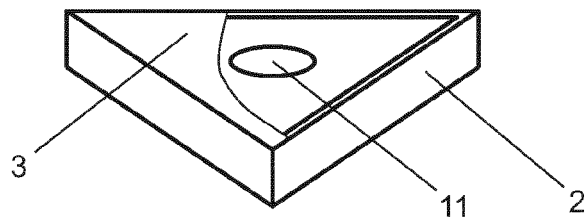


FIG 10

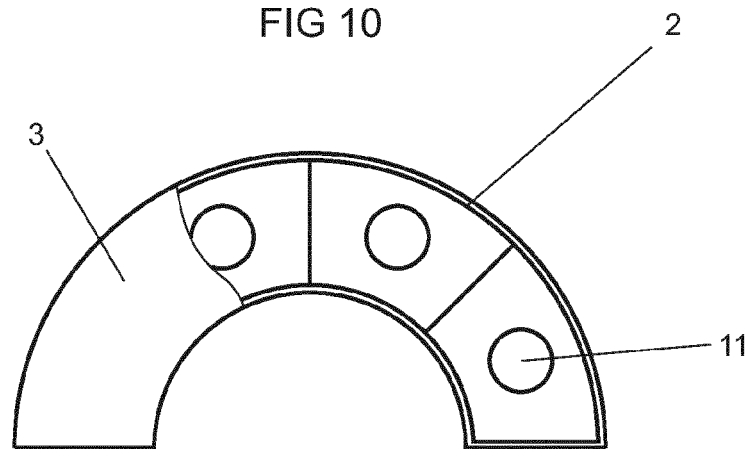


FIG 11

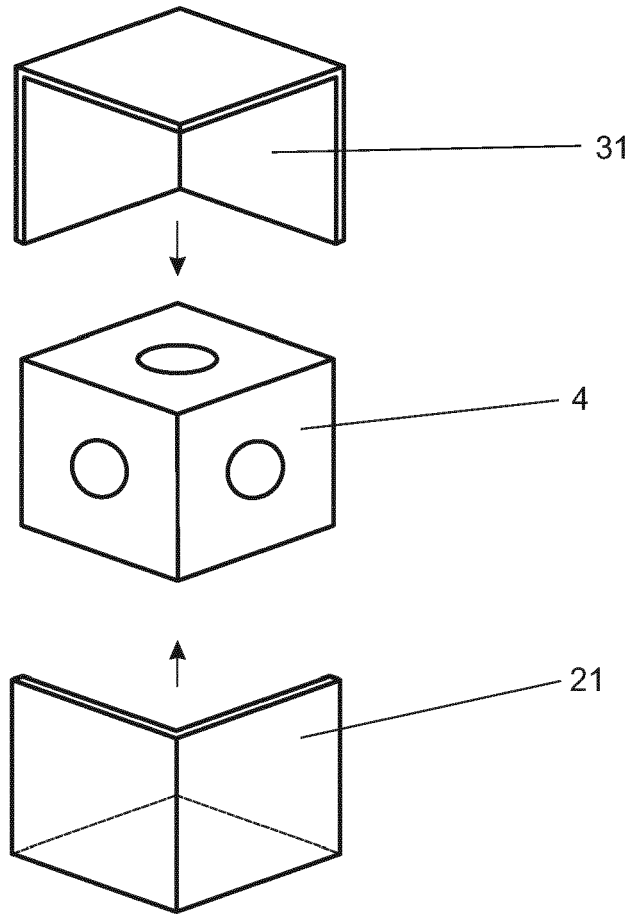


FIG 12

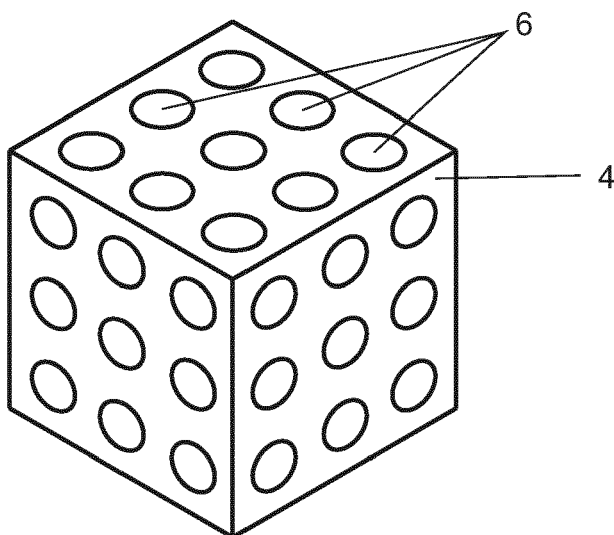


FIG 13A

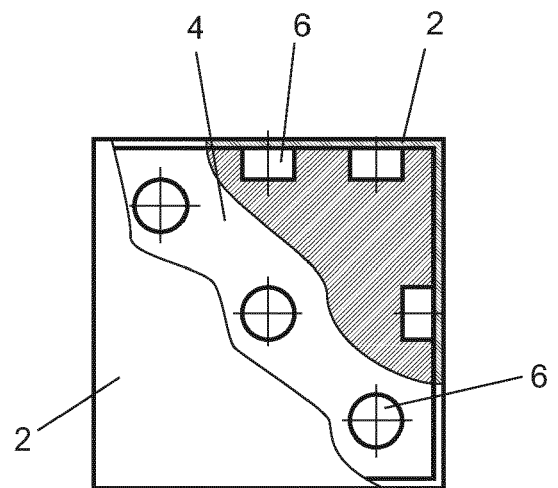


FIG 14

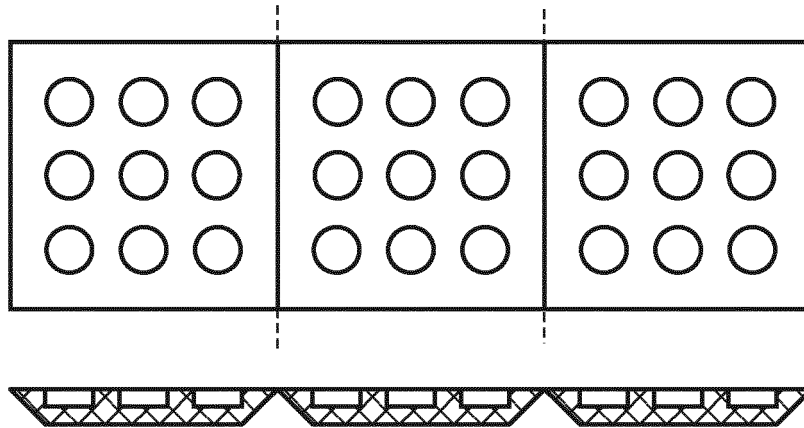


FIG 13B

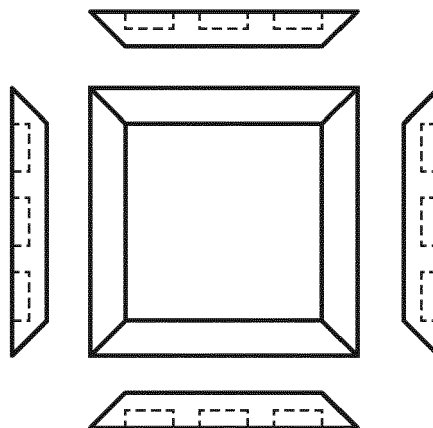
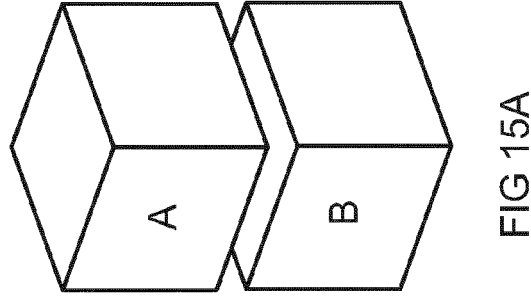
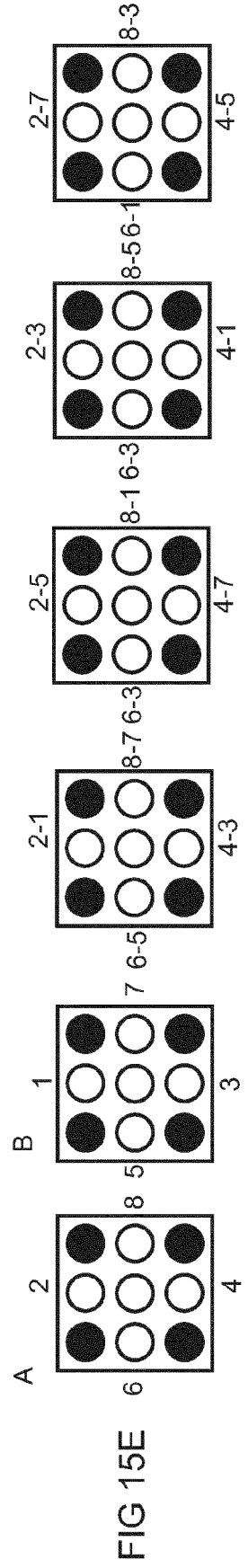
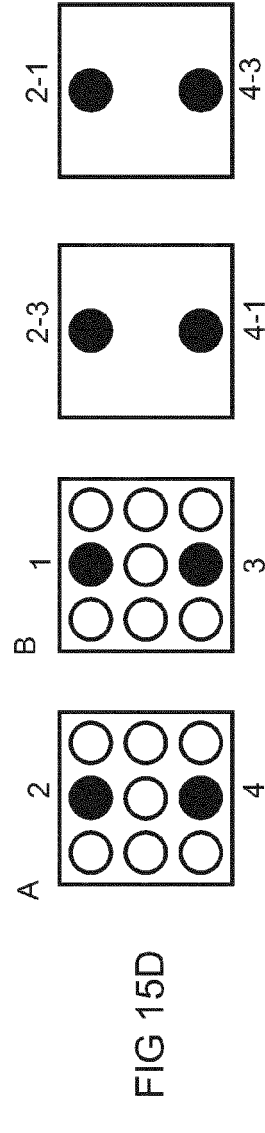
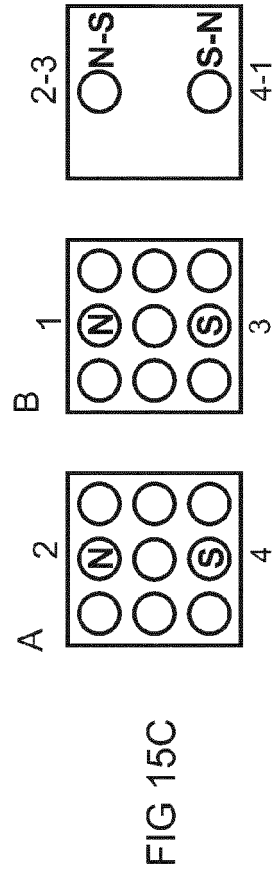
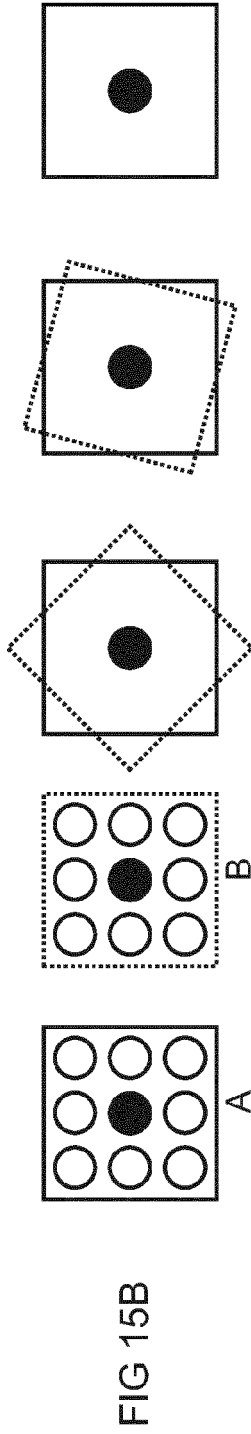
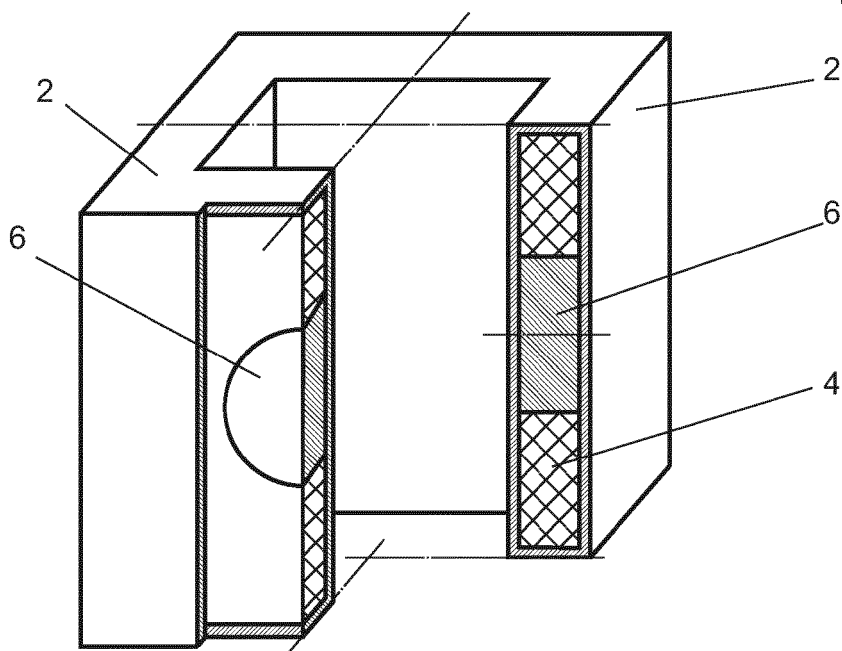
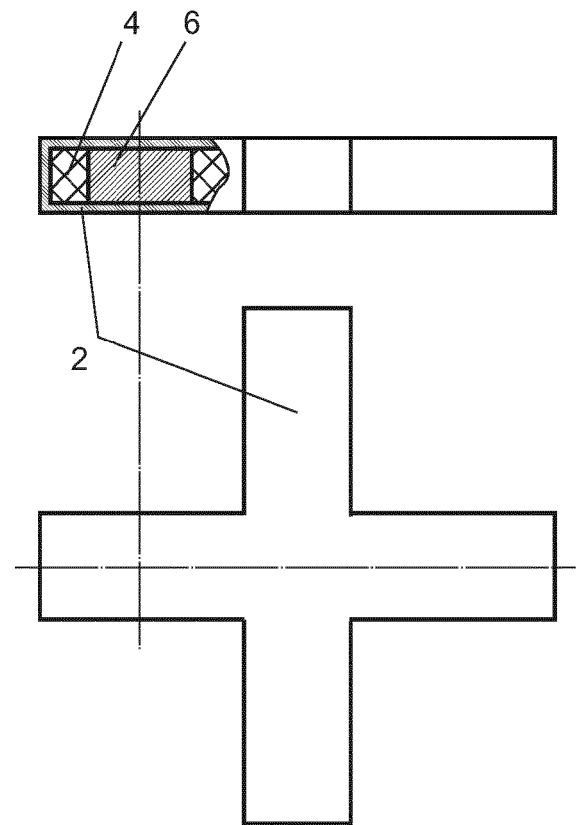
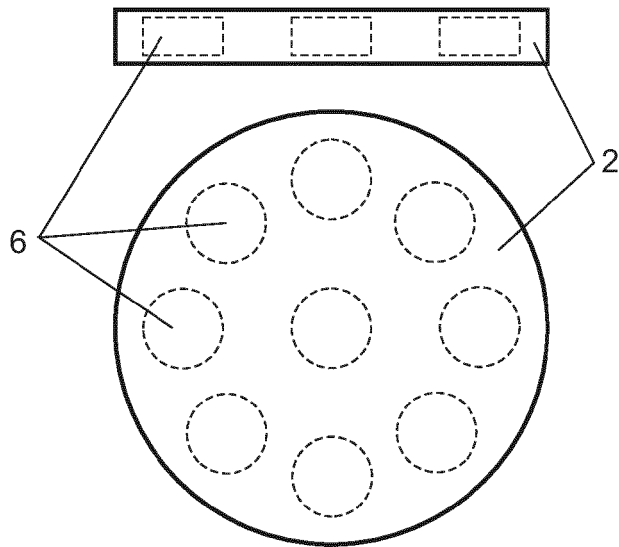


FIG 13C







EUROPEAN SEARCH REPORT

Application Number
EP 18 16 5569

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			A63H
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Place of search Munich		Date of completion of the search 10 September 2018	Examiner Lucas, Peter
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