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(54) Puzzle block

(57) A puzzle block, comprising: eight sub-blocks each having a plurality of faces, the plurality of sub-blocks being stacked one upon another to constitute a cylinder or prism, a plurality of single-unit prints, each being applied on the predetermined faces of the sub-blocks, a plurality of double-unit prints, each being applied on the predetermined two abreast faces of the two adjacent sub-blocks for connecting the sub-blocks, such that the sub-blocks are foldable to change the puzzle block into different forms; wherein the prints on the predetermined faces of the sub-blocks individually or jointly constitute different patterns when the puzzle block is folded to different forms and wherein magnets of opposite polarities are embedded into surfaces of a plurality of predetermined pairs of the sub-blocks.

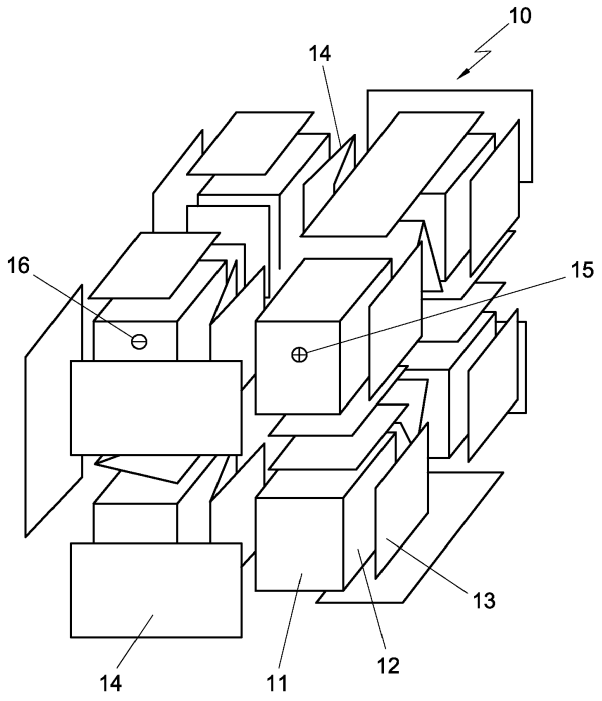

Fig. 1

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Description

Technical Field

[0001] The present invention relates to stationeries and gifts, and particularly to an puzzle block.

Background of the Invention

[0002] Most of the known puzzle blocks are only used for entertainment and cannot incorporate other functions. Besides, they are too complicated in structure to be disassembled. Once the patterns are in a state of disorder, they are very difficult to recover, which may frustrate the user and to inevitably reduce the entertainment. Furthermore, since it is always difficult to recover the initial patterns, the advertising use of the puzzle block will lost. In view of the foregoing defects of the known puzzle blocks, the present invention provides new designs to a puzzle block.

Summary of the Invention

[0003] The object of the present invention is to provide a puzzle block, which can be used for the purposes of advertisement and entertainment, such that the patterns and contents of advertisement become richer, and the build of the puzzle block is steady and not easy to fall apart.

[0004] The puzzle block according to the present invention comprises eight sub-blocks each having a plurality of faces, the plurality of sub-blocks being stacked one upon another to constitute a cylinder or prism; a plurality of single-unit prints, each being applied on the predetermined faces of the sub-blocks; and a plurality of double-unit prints, each being applied on the predetermined two abreast faces of the two adjacent sub-blocks for connecting the sub-blocks, such that the sub-blocks are foldable to change the puzzle block into different forms.

[0005] The prints on the predetermined faces of the sub-blocks individually or jointly constitute different patterns when the puzzle block is folded to different forms.

[0006] Magnets of opposite polarities are embedded into surfaces of a plurality of predetermined pairs of the sub-blocks and are covered by the single-unit or double-unit prints, such that when the puzzle block is folded to different forms, mutual attraction of the magnets provided in the predetermined pairs of the sub-blocks overcomes tension force at bend of the double-unit prints and causes the respective faces of the sub-blocks to abut against each other so as to maintain the form of the puzzle block.

[0007] The puzzle block additionally may include an annotation card for indicating the initial open position, which is disposed at the contact position between the single-unit prints or the double-unit prints of the adjacent sub-blocks to be initially opened.

[0008] Therefore, the puzzle block provided by the present invention has the following advantages compared with the prior art. The puzzle block is connected into an open or closed structure by the use of prints due to the geometric characteristics, such that it can transform into a number of different forms, thus improving the use of the advertisement display, and enhancing the amusement. The present invention is simple in manufacture and low in cost, and it has a steady build due to the introduction of magnets. Because the puzzle block may in an embodiment be provided with instructive marks in the form of an annotation card for indicating the initial open position, it is convenient for the user to operate.

Description of the Drawings

[0009]

Figure 1 is a schematic view of the basic structure of the puzzle block of the present invention;
Figure 2 is a perspective view of the exterior surfaces of the first embodiment of the puzzle block of the present invention;
Figure 3 is a schematic view of the folding steps of the first embodiment of the puzzle block of the present invention;
Figure 4 is a schematic view of the prints of the first embodiment of the puzzle block of the present invention;
Figure 5 is a schematic view of the accessory of the puzzle block of the present invention;
Figure 6 is a perspective view of the exterior surfaces of the second embodiment of the puzzle block of the present invention;
Figure 7 is a schematic view of the folding steps of the second embodiment of the puzzle block of the present invention;
Figure 8 is a schematic view of the prints of the second embodiment of the puzzle block of the present invention;
Figure 9 is a perspective view of the exterior surfaces of the third embodiment of the puzzle block of the present invention;
Figure 10 is a schematic view of the folding steps of the third embodiment of the puzzle block of the present invention;
Figure 11 is a schematic view of the prints of the third embodiment of the puzzle block of the present invention;
Figure 12 is a schematic view of the folding steps of the fourth embodiment of the puzzle block of the present invention;
Figure 13 is a schematic view of the prints of the fourth embodiment of the puzzle block of the present invention;
Figure 14 is a schematic view of the folding steps of the fifth embodiment of the puzzle block of the present invention; and
Figure 15 is a schematic view of the prints of the fifth

embodiment of the puzzle block of the present invention.

Description of the Preferred Embodiments

[0010] The puzzle block of the present invention comprises eight sub-blocks and a plurality of single-unit prints and double-unit prints, which can constitute different forms, such as regular cube, cube, prism and cylinder. The basic structure of the present invention will be described hereinafter according to an example of regular cube with reference to Figure 1. It should be appreciated that various forms have the same inventive concept.

[0011] As shown in Figure 1, the puzzle block 10 of the present invention comprises eight sub-blocks 11 each having a plurality of faces 12. A plurality of single-unit prints 13 are applied to predetermined faces 12 of the sub-blocks 11, and a plurality of double-unit prints 14 are applied to predetermined two abreast faces 12 of adjacent sub-blocks 11. The sub-blocks 12 are connected by double-unit prints such that they are mutually foldable to constitute different desirable forms. The prints can have patterns thereon to individually or jointly constitute various patterns. In addition, magnets 15 and 16 of opposite polarities can be embedded into the faces 12 of predetermined sub-blocks 11 according to different desirable forms of the puzzle blocks, and can be covered with single-unit prints 13 or double-unit prints 14 to keep clean appearance of the puzzle block.

[0012] The first embodiment of the present invention will be described hereinafter with reference to Figures 2-5.

[0013] Figure 2 is a perspective view showing the exterior surfaces of a puzzle block 100. The puzzle block 100 comprises eight cubic sub-blocks 111 each having six faces. These cubic sub-blocks 111 are stacked one upon another to constitute a regular cube. The puzzle block 100 further comprises sixteen single-unit prints 113 and sixteen double-unit prints 114. The regular cube has a top face (first face), a front face (second face), a bottom face (third face), a back face (fourth face), a left side face (fifth face) and a right side face (sixth face), which are covered with prints of the first face to the sixth face, respectively.

[0014] Figure 3 is a schematic view showing the folding steps of the puzzle block 100. Figure 4 shows the arrangement of the prints on various exterior shapes formed in the folding steps of the puzzle block 100.

[0015] In Figure 3, step 1 represents placing the puzzle block 100 in its initial regular cube form. The first surface of the puzzle block 100 is provided with two vertical double-unit prints. The second face is provided with two single-unit prints on the upper side, and one lateral double-unit print on the lower side. The third face is provided with four single-unit prints. The fourth face is provided with one lateral double-unit print on the upper side, and two single-unit prints on the lower side. The fifth face is provided with two vertical double-unit prints. The sixth face is provided with two vertical double-unit prints.

[0016] Step 2 represents opening the two vertical double-unit prints faceoff the first face away from each other to form a first cuboid on which a seventh face is provided with four lateral double-unit prints.

[0017] Step 3 represents rotating the regular cube by 180° from its initial position and opening the single-unit prints of the third face on the upper and lower sides away from each other.

[0018] Step 4 represents forming a second cuboid after the prints of the third face are opened, on which an eighth face is provided with two single-unit prints on each of left and right sides, and two lateral double-unit prints in the middle.

[0019] Step 5 represents opening the prints of the eighth face away from each other in the horizontal direction to form a third cuboid, on which a ninth face is provided with one vertical double-unit print on each of the left and right sides, and four single-unit prints in the middle.

[0020] It can be seen from Figure 4 that the single-unit prints of the eighth face on the upper left side and on the upper right side are respectively annotated with symbols "⊕"and "⊙", which represent that the surfaces of the cubic sub-blocks corresponding to the symbols are embedded with magnets of opposite polarities. When the puzzle block is folded towards the predetermined form, the two adjacent cubic sub-blocks having surfaces with magnets will rapidly abut against each other under the action of magnetic force and gives out a "beep" sound to keep the puzzle block in the predetermined form without falling apart. It should be appreciated that the position and number of the foregoing magnets are not limited by the embodiment and they should be determined based on the desirable forms of the puzzle block to be displayed.

[0021] Figure 5 shows that an annotation card 118 is provided on the top face of the puzzle block 100 of the first embodiment of the present invention. Particularly, the annotation card 118 is provided at the contact position between the two vertical double-unit prints of the first face to be initially opened (in step 2). The annotation card 118 indicates the initial open position of the puzzle block in order to facilitate the user's operation.

[0022] The second embodiment of the present invention will be described hereinafter with reference to Figures 6-8.

[0023] Figure 6 is a perspective view showing the exterior surfaces of a puzzle block 200. The puzzle block 200 comprises eight cubic sub-blocks 211 each having six faces. These cubic sub-blocks 211 are stacked one upon another to constitute a regular cube. The puzzle block 200 further comprises sixteen single-unit prints 213 and sixteen double-unit prints 214. The regular cube has a top face (first face), a front face (second face), bottom face (third face), a back face (fourth face), a left side face (fifth face), and a right side face (sixth face), which are covered with prints of the first face to the sixth face, respectively.

[0024] Figure 7 is a schematic view showing the folding steps of the puzzle block 200. Figure 8 shows the arrangement of the prints on various exterior shapes formed in the folding steps of the puzzle block 200.

[0025] In Figure 7, step 1 represents placing the puzzle block 200 in its initial regular cube position. The first face of the puzzle block 200 is provided with two vertical double-unit prints. The second face is provided with two single-unit prints on the upper side and one lateral double-unit print on the lower side. The third face is provided with four single-unit prints. The fourth face is provided with one lateral double-unit print on the upper side and two single-unit prints on the lower side. The fifth face is provided with two vertical double-unit prints. The sixth face is provided with two vertical double-unit prints.

[0026] Step 2 represents opening the two vertical double-unit prints of the first face on the top face away from each other to form a first cuboid, on which a seventh face is provided with four lateral double-unit prints.

[0027] Step 3 represents opening the prints of the seventh face away from each other to form a second cuboid, on which an eighth face if provided with one vertical double-unit prints on each of the left and right sides, and four single-unit prints in the middle. This arrangement is different from the first embodiment.

[0028] Step 4 represents rotating the regular cube by 180° from its initial position and opening the single-unit prints of the third face on the upper and lower sides away from each other.

[0029] Step 5 represents forming a third cuboid after the prints of the third face are opened, on which the two single-unit prints of the eighth face are located on each of the left and right sides and the two lateral double-unit prints of the eighth face are located in the middle.

[0030] Step 6 represents opening the prints of the eighth face away from each other in the horizontal direction to form a fourth cuboid, on which a ninth face is provided with one vertical double-unit print on each of the left and right sides and four single-unit prints in the middle.

[0031] It can be seen from Figure 8 that the single-unit prints of the eighth face on the upper left side and the lower left side, and the single-unit prints on the upper right side and the lower right side of the ninth face in the middle are respectively embedded with magnets of opposite polarities. When the puzzle block is folded towards the predetermined form, the two adjacent cubic sub-blocks having surfaces with magnets will rapidly abut against each other under the action of magnetic force and gives out a "beep" sound to keep the puzzle block in the predetermined form without falling apart. It should be appreciated that the position and number of the foregoing magnets are not limited by the embodiment and they should be determined based on the desirable forms of the puzzle block to be displayed.

[0032] The third embodiment of the present invention will be described hereinafter with reference to Figures 9-11.

[0033] Figure 9 is a perspective view showing the exterior surface of a puzzle block 300. The puzzle block 300 comprises eight cubic sub-blocks 311 each having six faces. These cubic sub-blocks 311 are stacked one upon another to constitute a regular cube. The puzzle block 300 further comprises sixteen single-unit prints 313 and sixteen double-unit prints 314. The regular cube has a top face (first face), a front face (second face), bottom face (third face), a back face (fourth face), a left side face (fifth face), and a right side face (sixth face), which are covered with prints of the first face to the sixth face, respectively.

[0034] Figure 10 is a schematic view showing the folding steps of the puzzle block 300. Figure 11 shows the arrangement of prints on various exterior shapes formed in the folding steps of the puzzle block 300.

[0035] In Figure 10, step 1 represents placing the puzzle block 300 in the initial regular cube position. The first face of the puzzle block 300 is provided with two vertical double-unit prints. The second face is provided with two single-unit prints on the upper side and one lateral double-unit print on the lower side. The third face is provided with four single-unit prints. The fourth face is provided with one lateral double-unit print of the fourth face on the upper side and two single-unit prints on the lower side. The fifth face is provided with two vertical double-unit prints. The sixth face is provided with two vertical double-unit prints.

[0036] Step 2 represents opening the two vertical double-unit prints of the first face on the top face away from each other to form a first cuboid, on which a seventh face is provided with four lateral double-unit prints.

[0037] Steps 3 and 4 represent opening the prints of the seventh face away from each other in the horizontal direction to form a second cuboid and opening the prints from the middle in the vertical direction and rotating them by 90°.

[0038] Step 5 represents forming a regular cube presenting six interior surfaces of the sub-blocks. Now, a seventh face, i.e. the top face of the puzzle block 300, is provided with two vertical double-unit prints. A eighth face, i.e. the front face, is provided with two single-unit prints on the upper side and one lateral double-unit print on the lower side. A ninth face, i.e. the bottom face, is provided with four single-unit prints. A tenth face, i.e. the back face, is provided with one lateral double-unit print on the upper side and two double-unit prints on the lower side. A eleventh face, i.e. the left side face, is provided with two vertical double-unit prints. A twelfth face, i.e. the right side face is provided with two vertical double-unit prints.

[0039] It can be seen from Figure 11 that the two surfaces corresponding to the two single-unit prints of the second face on the upper side are embedded with magnets of opposite polarities. The two surfaces corresponding to the two single-unit prints of the third face on the right side are embedded with magnets of opposite polarities. The two surfaces corresponding to the two single-

unit prints of the eighth face on the upper side are embedded with magnets of opposite polarities. The two surfaces corresponding to the two single-unit prints of the ninth face on the left side are embedded with magnets of opposite polarities.

[0040] The fourth embodiment of the present invention will be described hereinafter with reference to Figures 12-13.

[0041] Figure 12 is a schematic view showing the folding steps of a puzzle block 400. Figure 13 shows the arrangement of prints on various exterior shapes formed in the folding steps of the puzzle block 400.

[0042] The puzzle block 400 comprises eight triangular-prism sub-blocks, each having five faces including two top faces, two right-angle faces and one inclined face. The triangular-prism sub-blocks are stacked one upon another to constitute a cube. The puzzle block 400 further comprises eight single-unit prints and sixteen double-unit prints.

[0043] Step 1 shows that the first face, i.e. the front face of the puzzle block 400 in its initial form, is provided with four double-unit prints 1A-1D.

[0044] Step 2 shows that the second face, i.e. the inclined face of the puzzle block after the two double-unit prints of the first face being rotated relative to the other two double-unit prints of the first face to form a triangular prism, is provided with two lateral double-unit prints 2A, 2B.

[0045] Step 3 shows that the third face, i.e. the front face of the puzzle block 400 in a state after the two lateral double-unit prints 2A, 2B of the second face being opened away from each other, is provided with two vertical double-unit prints 3A, 3B.

[0046] Step 4 shows that the fourth face, i.e. the inclined face of the puzzle block 400 in a state after the two vertical double-unit prints 3A, 3B of the third face being opened to form a prism, is provided with four lateral double-unit prints 4A-4D.

[0047] Step 5 shows that the fifth face, i.e. the front face of the puzzle block 400 in a state after the lateral double-unit prints of the fourth face on upper and lower sides being opened in the horizontal direction, is provided with one vertical double-unit print 5A and 5D respectively on each of the left and right sides, and four single-unit prints 5B, 5B, 5C, 5C in the middle.

[0048] Step 6 shows that the front face of puzzle block 400 is reverted to the first face after folding in the vertical direction.

[0049] Step 7 shows the sixth face, i.e. the front face of the puzzle block after a 180° turn of the first face in step 6, is provided with two single-unit prints 6D, 6D and 6B, 6B on each of the upper left side and lower right side, and one double-unit print 6C, 6A on each of the lower left side and the upper right side.

[0050] It can be seen from Figure 13 that the pair of surfaces corresponding to the single-unit prints 5C, 5C of the fifth face on the upper right side and lower right side in the middle are embedded with magnets of opposite polarities. The surfaces corresponding to the two double-unit prints 6C and 6A of the sixth face on the lower left side and upper right side are embedded with two magnets of opposite polarities.

[0051] The fifth embodiment of the present invention will be hereinafter described with reference to Figures 14-15.

[0052] An puzzle block 500 comprises eight 1/4 cylindrical sub-blocks each having five faces including two top faces, two side faces and one arcuate face. The 1/4 cylindrical sub-blocks being stacked one upon another to constitute a cylinder. The puzzle block 500 also comprises eight single-unit prints and sixteen double-unit prints.

[0053] Step 1 shows that the front face of the lying puzzle block 500 is provided with one double-unit print of a first face on each of the left and right sides. The back face is provided with four single-unit prints of the first face at four corners. The left side face is provided with one double-unit print of a fifth face on each of the upper and lower sides. The right side face is provided with one double-unit print of a fourth face on each of the upper and lower sides.

[0054] Steps 2 and 3 show that the central plane, when the puzzle block 500 is in a state after the two double-unit prints of the first face being opened in the vertical direction to form a semi-cylinder, is provided with four vertical double-unit prints of a second face at four corners.

[0055] Step 4 shows that the front face, when the puzzle block 500 is in a state after the four vertical double-unit prints of the second face being opened in the horizontal direction, is provided with one lateral double-unit print of a third face on each of the left and right sides, and with one vertical double-unit prints of the third face on each the upper and lower sides in the middle.

[0056] Steps 5 and 6 show forming the puzzle block 500 into two semi-cylinders by folding the vertical double-unit prints of the third face along the horizontal centerline.

[0057] Step 7 shows forming the puzzle block 500 into two cylinders by folding the two vertical double-unit prints of the second face along the horizontal centerline. The top face of the left cylinder is provided with a double-unit print of a sixth face on the left side and two single-unit prints of the sixth face on the right side. The top face of the right cylinder is provided with a double-unit print of a seventh face on the right side and two single-unit prints of the seventh face on the left side.

[0058] It can be seen from Figure 15 that the surfaces of the 1/4 cylinder adjacent to the left and right ends of the vertical double-unit print of the second face on the upper right side is provided with magnets of opposite polarities. The surfaces of the 1/4 cylinder adjacent to the left and right ends of the vertical double-unit print of the second face on the lower left side are provided with magnets of opposite polarities. The surfaces of the 1/4 cylinders adjacent to the left and right ends of the vertical double-unit prints of the third face on the upper and lower

sides in the middle are provided with magnets of opposite polarities.

Claims

1. A puzzle block, comprising:

eight sub-blocks each having a plurality of faces, the plurality of sub-blocks being stacked one upon another to constitute a cylinder or prism;
a plurality of single-unit prints, each being applied on predetermined faces of the sub-blocks;
a plurality of double-unit prints, each being applied on predetermined two abreast faces of the two adjacent sub-blocks for connecting the sub-blocks, such that the sub-blocks are foldable to change the puzzle block into different forms;
wherein the prints on the predetermined faces of the sub-blocks individually or jointly constitute different patterns when the puzzle block is folded to different forms;
magnets of opposite polarities are embedded into surfaces of a plurality of predetermined pairs of the sub-blocks and are covered by the single-unit or double-unit prints, such that when the puzzle block is folded to different forms, mutual attraction of the magnets provided in the predetermined pairs of the sub-blocks overcomes tension force at bend of the double-unit prints and causes the respective faces of the sub-blocks to abut against each other so as to maintain the form of the puzzle block.

2. The puzzle block according to claim 1, wherein the puzzle block further comprises an annotation card for indicating the initial open position, which is disposed at the contact position between the single-unit prints or the double-unit prints of the adjacent sub-blocks to be initially opened.

3. The puzzle block according to claim 1 or 2, **characterized in that** during folding of the sub-blocks of the puzzle block, the respective faces of the predetermined pairs of sub-blocks rapidly abut against each other under the action of magnet force and give out a "Beep" sound.

4. The puzzle block according to any one of claims 1-3, **characterized in that**:

the puzzle block comprising eight cubic sub-blocks each having six faces, the cubic sub-blocks being stacked one upon another to constitute a regular cube;
sixteen single-unit prints; and
sixteen double-unit prints;
wherein a first face, i.e. the top face of the puzzle block when viewed in the initial regular cube form, is provided with two vertical double-unit prints;
a second face, i.e. the front face of the puzzle block when viewed in the initial regular cube form, is provided with two single-unit prints on the upper side and one lateral double-unit print on the lower side;
a third face, i.e. the bottom face of the puzzle block when viewed in the initial regular cube form, is provided with four single-unit prints;
a fourth face, i.e. the back face of the puzzle block when viewed in the initial regular cube form, is provided with one lateral double-unit print on the upper side and two single-unit prints on the lower side;
a fifth face, i.e. the left side face of the puzzle block when viewed in the initial regular cube form, is provided with two vertical double-unit prints;
a sixth face, i.e. the right side face of the puzzle block when viewed in the initial regular cube form, is provided with two vertical double-unit prints;
a seventh face, i.e. the top face of a first rectangular cuboid formed by the puzzle block after the two vertical double-unit prints of first face being opened away from each other, is provided with four lateral double-unit prints;
a eighth face, i.e. the top face of a second rectangular cuboid formed by the puzzle block after being rotated by 180° and the single-unit prints of third face on the upper and lower sides being opened away from each other, is provided with two single-unit prints on each of the left and right sides, and two lateral double-unit prints in the middle;
a ninth face, i.e. the top face of a third rectangular cuboid formed by the puzzle block after the prints of eighth face being opened away from each other in the horizontal direction, is provided with one vertical double-unit print on each of the left and right sides, and four single-unit prints in the middle;
the surfaces of the cubic sub-blocks corresponding to the single-unit of the eighth-face on the upper left side and upper right side are respectively embedded with magnets of opposite polarities; and
the surfaces of the cubic sub-blocks corresponding to the single-unit prints of the ninth-face on the upper right and lower right sides in the middle are respectively embedded with magnets of opposite polarities.

5. The puzzle block according to any one of claims 1-3, **characterized in that**:

the puzzle block comprising eight cubic sub-blocks each having six faces, the cubic sub-blocks being stacked one upon another to constitute a regular cube;
sixteen single-unit prints; and
sixteen double-unit prints;
wherein a first face , i.e. the top face of the puzzle block when viewed in the initial regular cube form, is provided with two vertical double-unit prints;
a second face, i.e. the front face of the puzzle block when viewed in the initial regular cube form, is provided with two single-unit prints on the upper side and one lateral double-unit print on the lower side;
a third face, i.e. the bottom face of the puzzle block when viewed in the initial regular cube form, is provided with four single-unit prints;
a fourth face, i.e. the back face of the puzzle block when viewed in the initial regular cube form, is provided with one lateral double-unit print on the upper side and two single-unit prints on the lower side;
a fifth face, i.e. the left side face of the puzzle block when viewed in the initial regular cube form, is provided with two vertical double-unit prints;
a sixth face, i.e. the right side face of the puzzle block when viewed in the initial regular cube form, is provided with two vertical double-unit prints;
a seventh face, i.e. the top face of a first rectangular cuboid formed by the puzzle block after the two vertical double-unit prints of the first face on the top face being opened away from each other, is provided with four lateral double-unit prints;
a eighth face, i.e. the top face of a second rectangular cuboid formed by the puzzle block after the prints of the seventh face being opened away from each other in the horizontal direction, is provided with one vertical double-unit print on each of the left and right sides, and four single-unit prints in the middle;
a ninth face, i.e. the top face of a third rectangular cuboid formed by the puzzle block after being rotated by 180° and the single-unit prints of the third face on the upper and lower sides being opened away from each other to form the cuboid provided with the prints of eighth face, and the prints of eighth face being opened away from each other in the horizontal direction, is provided with two vertical double-unit prints on each of the left and right sides, and four single-unit prints in the middle;
the surfaces of the cubic sub-blocks corresponding to the single-unit prints of the eighth face on the upper left side and lower left side in the middle are respectively embedded with magnets of opposite polarities; and
the surfaces of the cubic sub-blocks corresponding to the single-unit prints of the ninth face on the upper right side and lower right side in the middle are respectively embedded with magnets of opposite polarities.

6. The puzzle block according to any one of claims 1-3, **characterized in that**:

the puzzle block comprising eight cubic sub-blocks each having six faces, the cubic sub-blocks being stacked one upon another to constitute a initial regular cube;
sixteen single-unit prints; and
sixteen double-unit prints;
wherein a first face, i.e. the top face of the puzzle block in the initial regular cube form, is provided with two vertical double-unit prints,
a second face, i.e. the front face of the puzzle block in the initial regular cube form, is provided with two single-unit prints on the upper side and one lateral double-unit print on the lower side,
a third face, i.e. the bottom face of the puzzle block in the initial regular cube form, is provided with four single-unit prints,
a fourth face, i.e. the back face of the puzzle block in the initial regular cube form, is provided with one lateral double-unit print on the upper side and two single-unit prints of the fourth face on the lower side,
a fifth face, i.e. the left side face of the puzzle block in the initial regular cube form, is provided with two vertical double-unit prints,
a sixth face, i.e. the right side face of the puzzle block in the initial regular cube form, is provided with two vertical double-unit prints,
wherein the two vertical double-unit prints of the first face are opened away from each other to form a first cuboid, the prints on the upper and lower sides are opened away from each other in the horizontal direction to form a second cuboid, the prints are further opened from the middle in the vertical direction and being rotated by 90° to form a subsequent regular cube showing six interior surfaces of the sub-blocks,
a seventh face, i.e. the top face of the puzzle block in the subsequent regular cube form, is provided with two vertical double-unit prints.
a eighth face, i.e. the front face of the puzzle block in the subsequent regular cube form, is provided with two single-unit prints on the upper side and one lateral double-unit print on the lower side,
a ninth face, i.e. the bottom face of the puzzle block in the subsequent regular cube form, is provided with four single-unit prints,

a tenth face, i.e. the back face of the puzzle block in the subsequent regular cube form, is provided with one lateral double-unit print on the upper side and two double-unit prints on the lower side,
an eleventh face, i.e. the left side face of the puzzle block in the subsequent regular cube form, is provided with two vertical double-unit prints,
a twelfth face, i.e. the right side face of the puzzle block in the subsequent regular cube form, is provided with two vertical double-unit prints.
wherein the two surfaces corresponding to the two single-unit prints of the second face on the upper side are embedded with magnets of opposite polarities,
the two surfaces corresponding to the two single-unit prints of the third face on the right side are embedded with magnets of opposite polarities,
the two surfaces corresponding to the two single-unit prints of the eighth face on the upper side are embedded with magnets of opposite polarities,
the two surfaces corresponding to the two single-unit prints of the ninth face on the left side are embedded with magnets of opposite polarities.

7. The puzzle block according to any one of claims 1-3, comprising:

eight triangular-prism sub-blocks, each having five faces including two top faces, two right-angle faces and one inclined face, the triangular-prism sub-blocks being stacked one upon another to constitute a cube;
eight single-unit prints; and
sixteen double-unit prints;
wherein a first face, i.e. the front face of the puzzle block in its initial form, is provided with four double-unit prints,
a second face, i.e. the inclined face of the puzzle block after the two double-unit prints of the first face being rotated relative to the other two double-unit prints of the first face to form a first triangular prism, is provided with two lateral double-unit prints,
a third face, i.e. the front face of the puzzle block in a state after the two lateral double-unit prints of the second face being opened away from each other, is provided with two vertical double-unit prints,
a fourth face, i.e. the inclined face of the puzzle block in a state after the two vertical double-unit prints of the third face being opened to form a second triangular prism, is provided with four lateral double-unit prints,
a fifth face, i.e. the front face of the puzzle block in a state after the lateral double-unit prints of the fourth face on upper and lower sides being opened in the horizontal direction, is provided with one vertical double-unit print on each of the left and right sides, and four single-unit prints in the middle,
a sixth face, i.e. the front face of the puzzle block after a 180° turn of the first face when the puzzle block being reverted to the first face position after being folded in the vertical direction, is provided with two single-unit prints on each of the upper left side and lower right side, and one double-unit print on each of the lower left side and the upper right side,
wherein the pair of surfaces corresponding to the single-unit prints of the fifth face on the upper right side and lower right side in the middle are respectively embedded with magnets of opposite polarities,
the surfaces corresponding to the two double-unit prints of the sixth face on the lower left side and upper right side are embedded with two magnets of opposite polarities.

8. The puzzle block according to any one of claim 1-3, comprising:

eight 1/4 cylindrical sub-blocks, each having five faces including two top faces, two side faces and one face, the 1/4 cylindrical sub-blocks being stacked one upon another to constitute a cylinder;
eight single-unit prints; and
sixteen double-unit prints;
wherein the front face of the lying puzzle block is provided with one double-unit print of a first face on each of the left and right sides, the back face is provided with four single-unit prints of the first face at four corners, the left side face is provided with one double-unit print of a fifth face on each of the upper and lower sides, the right side is provided with one double-unit print of a fourth face on each of the upper and lower sides,
when the puzzle block is in a state after the two double-unit prints of the first face being opened in the vertical direction to form a semi-cylinder, the front face of the puzzle block is provided with four vertical double-unit prints of a second face at four corners,
when the puzzle block is in a state after the four vertical double-unit prints of the second face being opened in the horizontal direction, the front face of the puzzle block is provided with one lateral double-unit print of a third face on each of the left and right sides, and with one vertical double-unit prints of the third face on each the upper and lower sides in the middle,
the puzzle block is formed into two semi-cylin-

ders by folding the vertical double-unit prints of the third face along the horizontal centerline, and is then formed into two cylinders by folding the two vertical double-unit prints of the second face along the horizontal centerline, a top face of the left cylinder is provided with one double-unit print of a sixth face on the left side and two single-unit prints of the sixth face on the right side, a top face of the right cylinder is provided with a double-unit print of a seventh face on the right side and two single-unit prints of the seventh face on the left side,

wherein the surfaces of the 1/4 cylinder adjacent to the left and right ends of the vertical double-unit print of the second face on the upper right side is provided with magnets of opposite polarities,

the surfaces of the 1/4 cylinder adjacent to the left and right ends of the vertical double-unit print of the second face on the lower left side are provided with magnets of opposite polarities,

the surfaces of the 1/4 cylinders adjacent to the left and right ends of the vertical double-unit prints of the third face on the upper and lower sides in the middle are provided with magnets of opposite polarities.

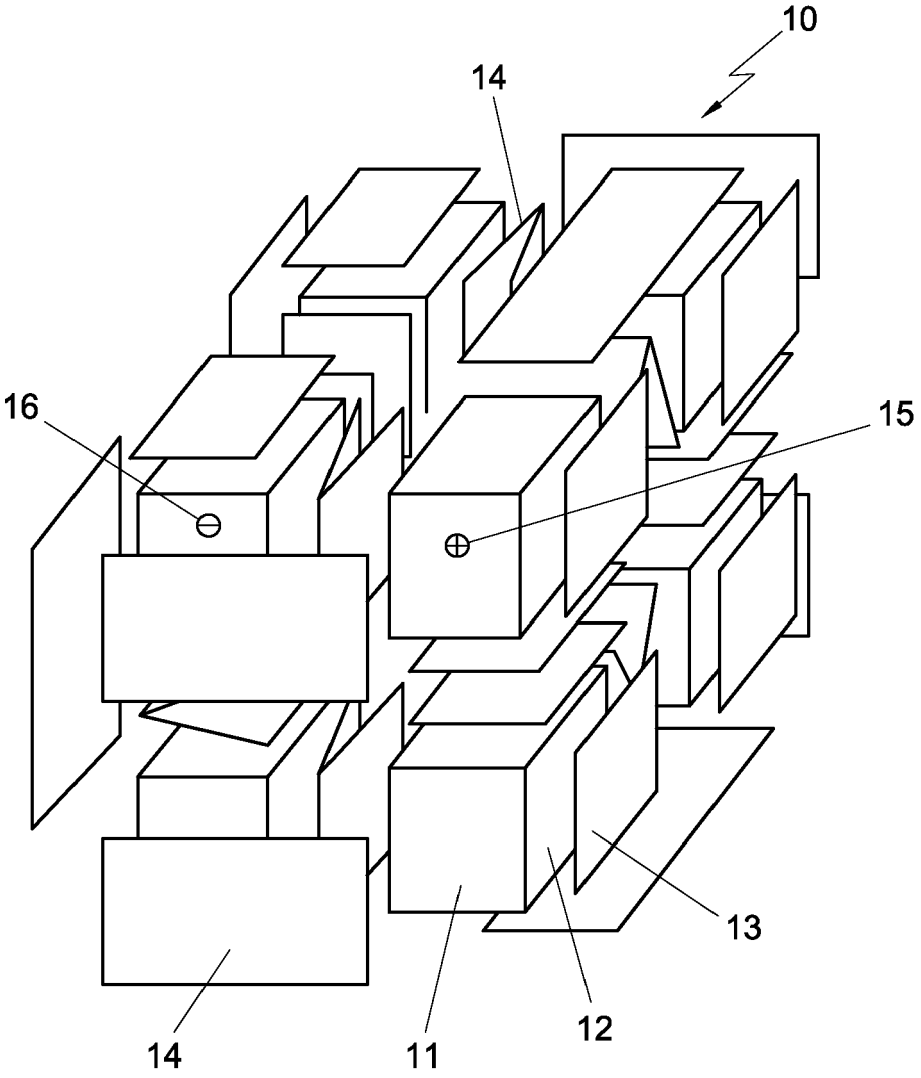

Fig. 1

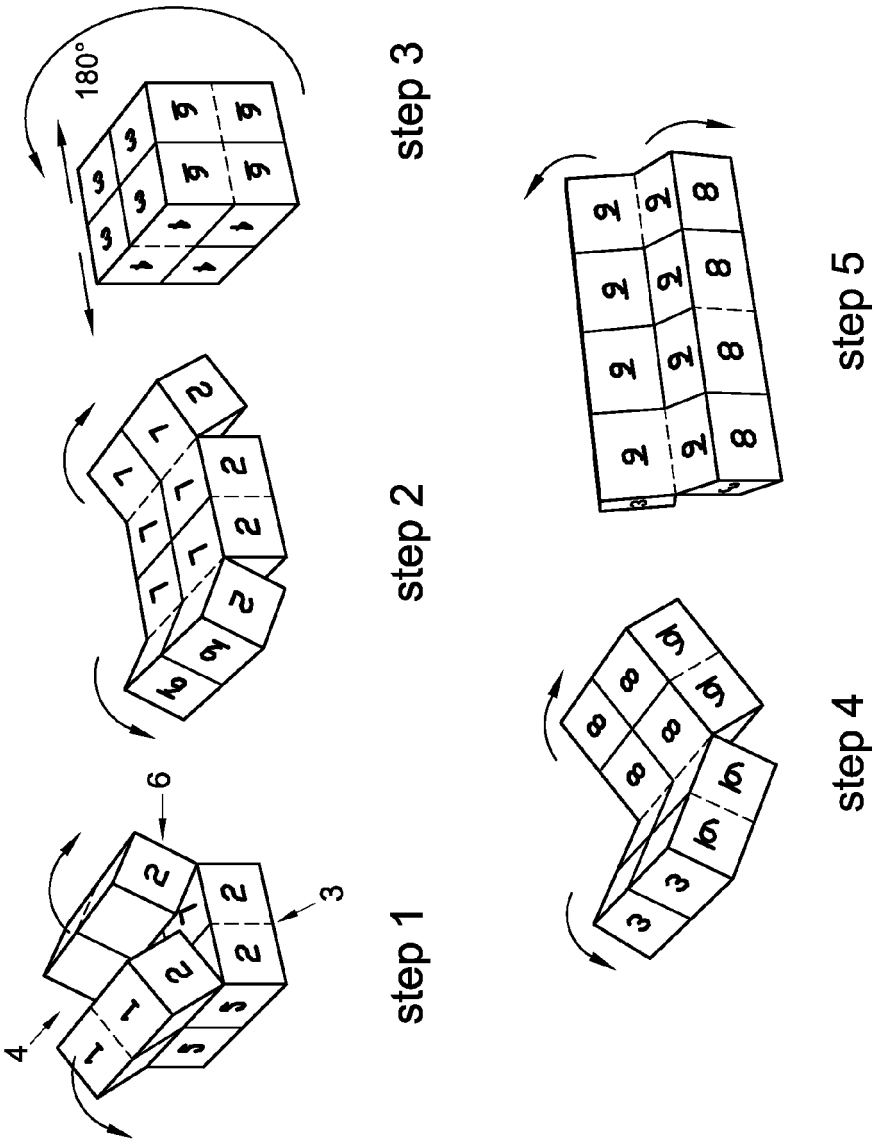

Fig. 3

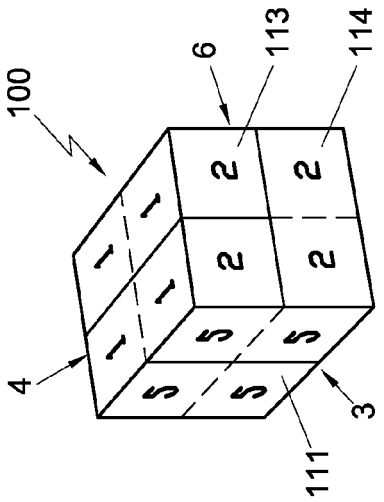

Fig. 2

7	7	7	7			4	4		1	1	
7	7	7	7			4	4		1	1	
⊕ 8	8	8	⊖ 8			5	5		2	2	
8	8	8	8			5	5		2	2	
9	9	⊕ 9	9			6	6		3	3	
9	9	⊖ 9	9			6	6		3	3	

Fig. 4

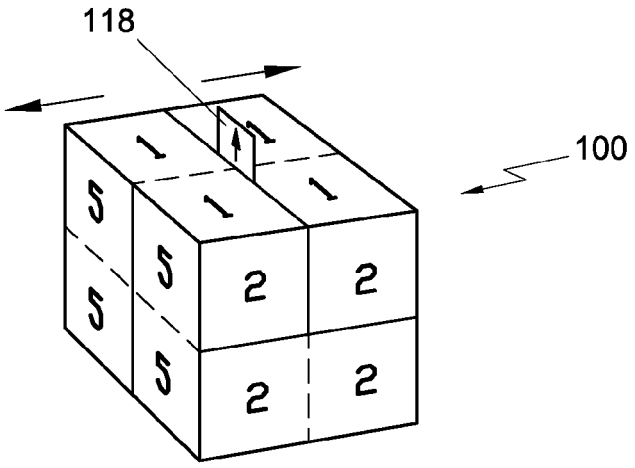

Fig. 5

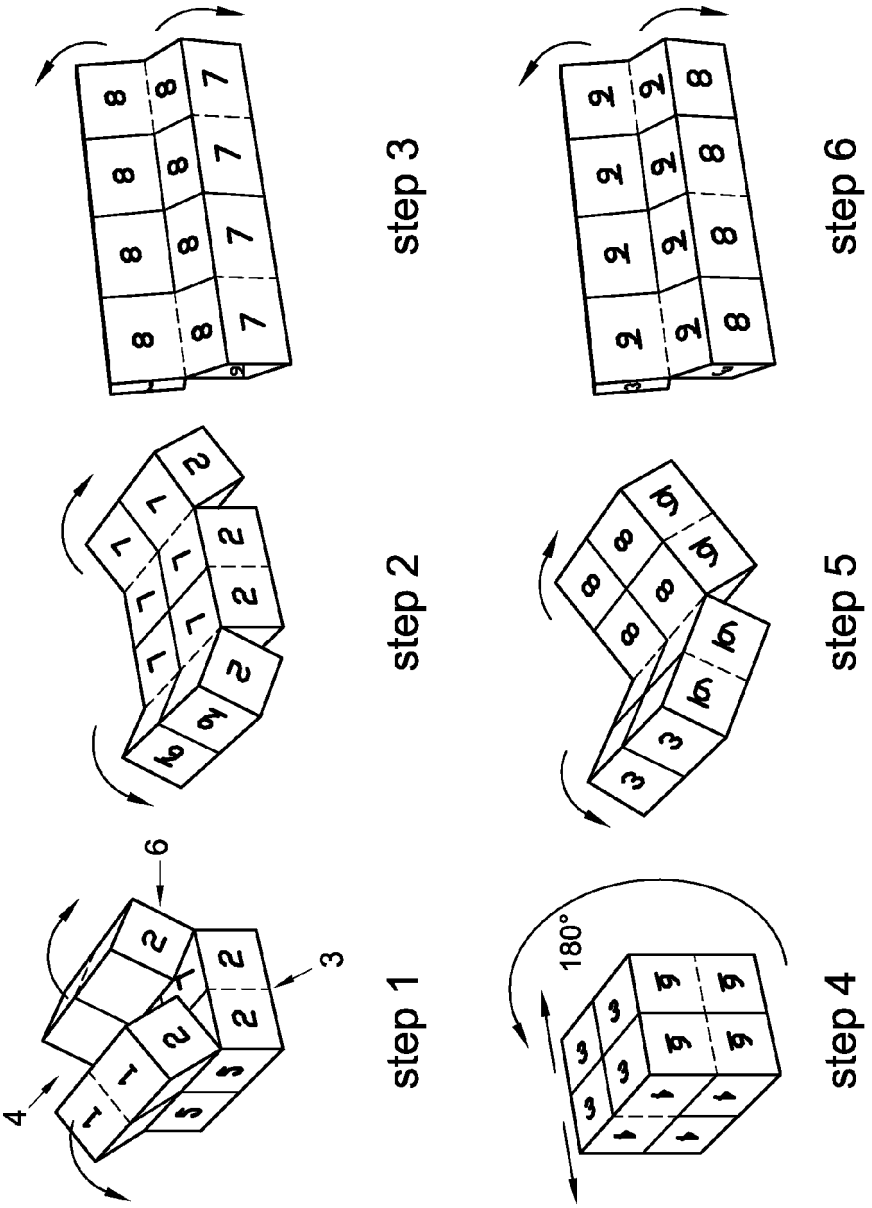

Fig. 7

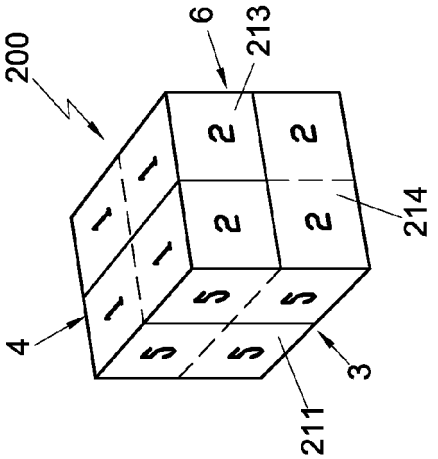

Fig. 6

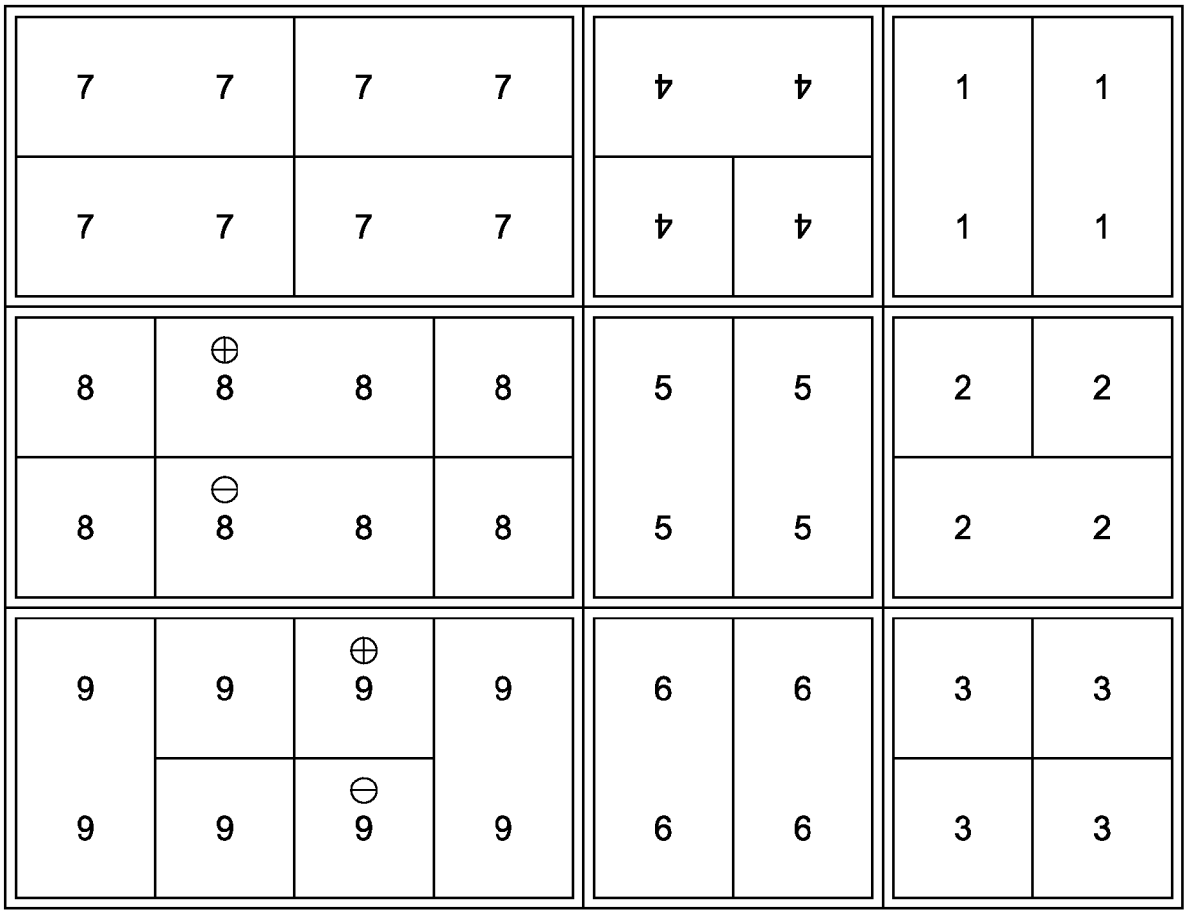

Fig. 8

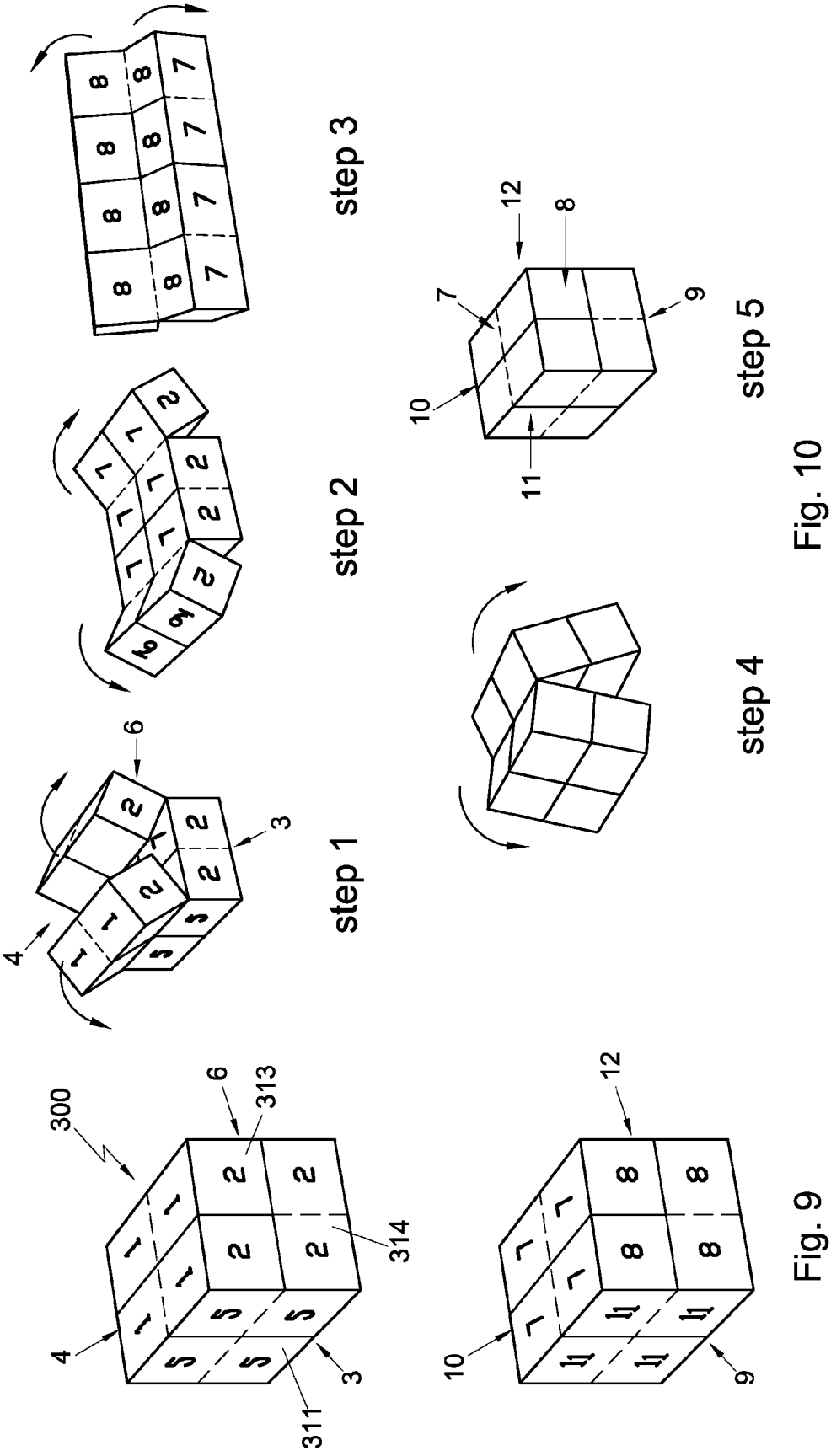

Fig. 9

Fig. 10

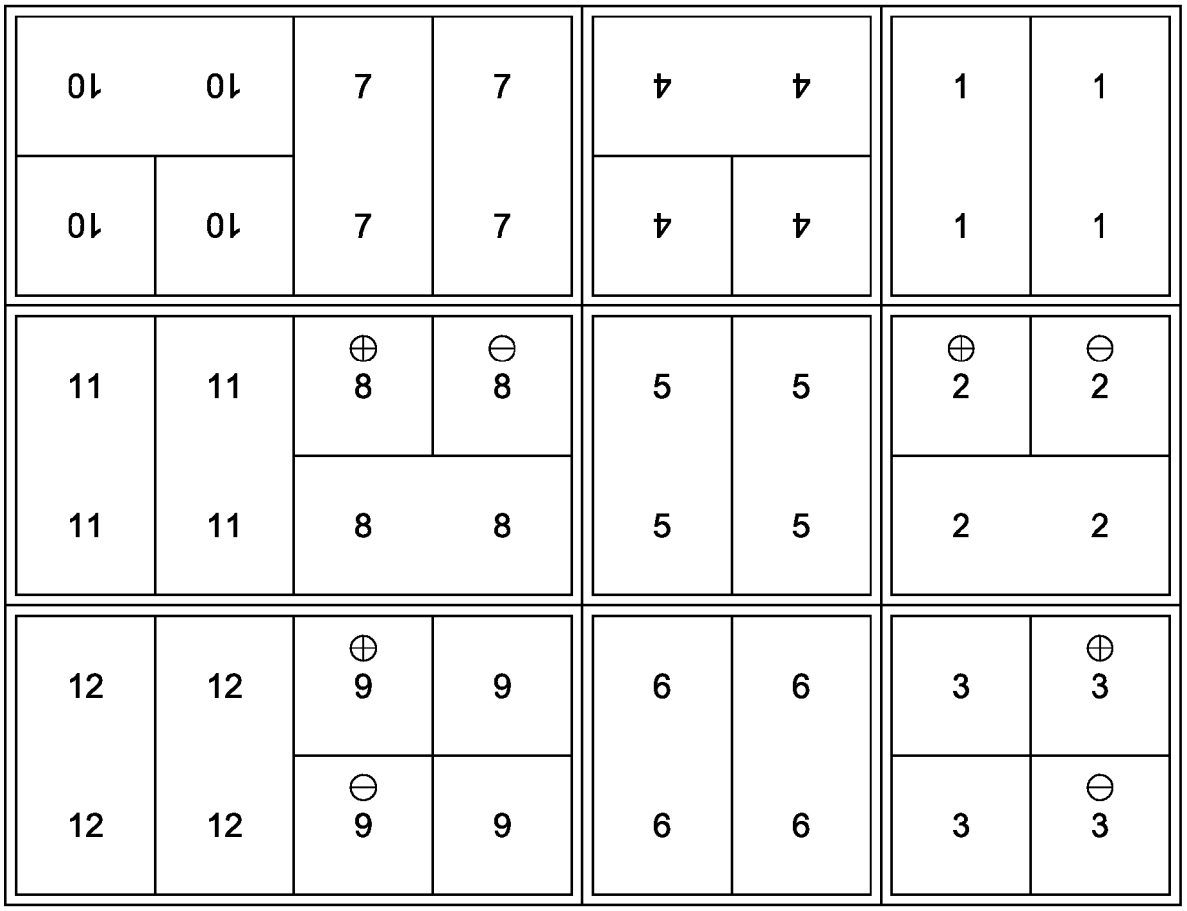
10
10
7
7
4
4
1
1
10
10
7
7
4
4
1
1
11
11
⊕
8
⊖
8
5
5
⊕
2
⊖
2
11
11
8
8
5
5
2
2
12
12
⊕
9
9
6
6
3
⊕
3
12
12
⊖
9
9
6
6
3
⊖
3

Fig. 11

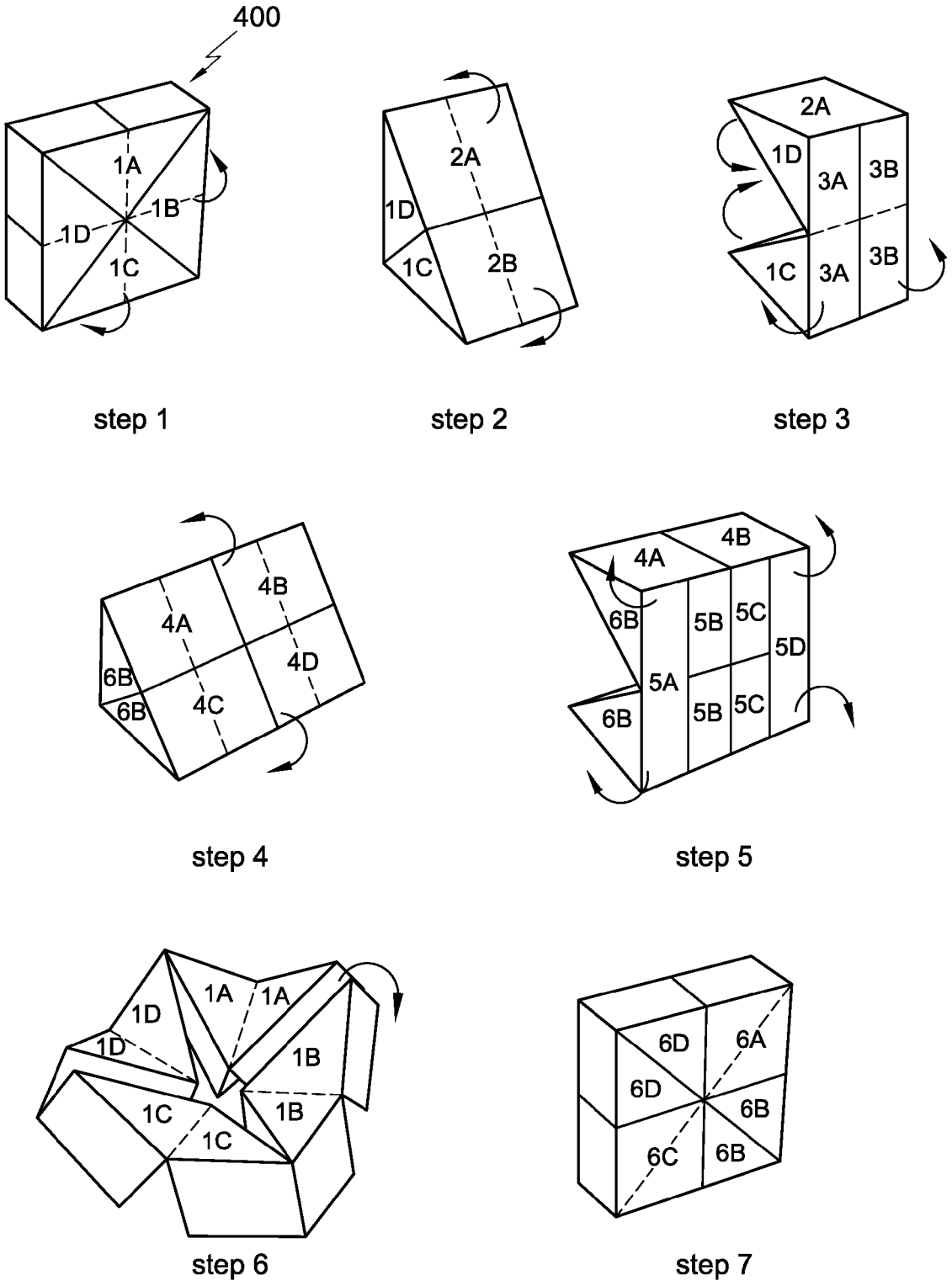
400
1A
1B
1D
1C
step 1
2A
1D
1C
2B
step 2
2A
1D
3A
3B
1C
3A
3B
step 3
4A
4B
6B
4D
6B
4C
step 4
4A
4B
6B
5B
5C
5D
5A
6B
5B
5C
step 5
1A
1A
1D
1D
1B
1C
1B
1C
step 6
6D
6A
6D
6B
6C
6B
step 7

Fig. 12

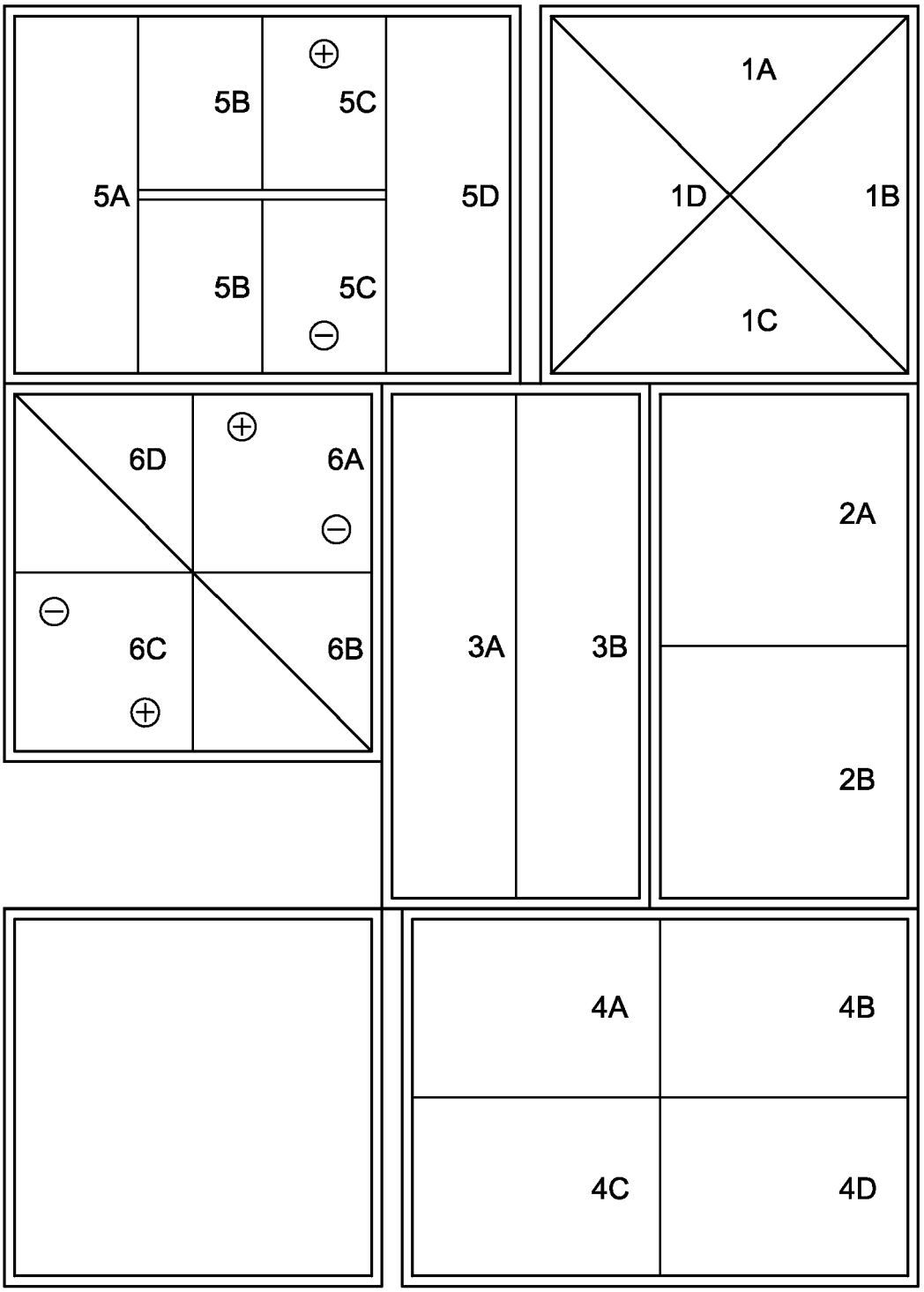

Fig. 13

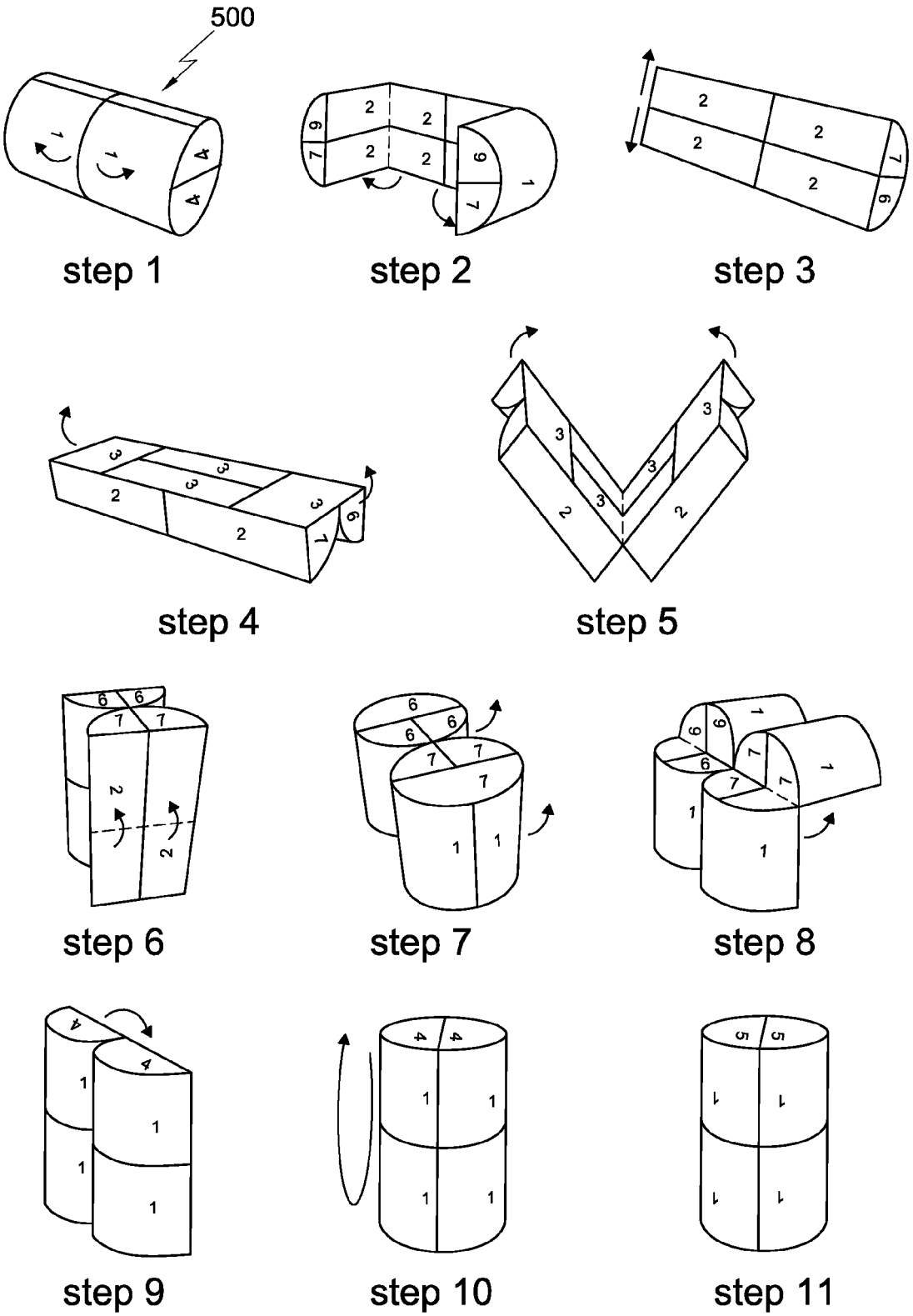
500
step 1
step 2
step 3
step 4
step 5
step 6
step 7
step 8
step 9
step 10
step 11

Fig. 14

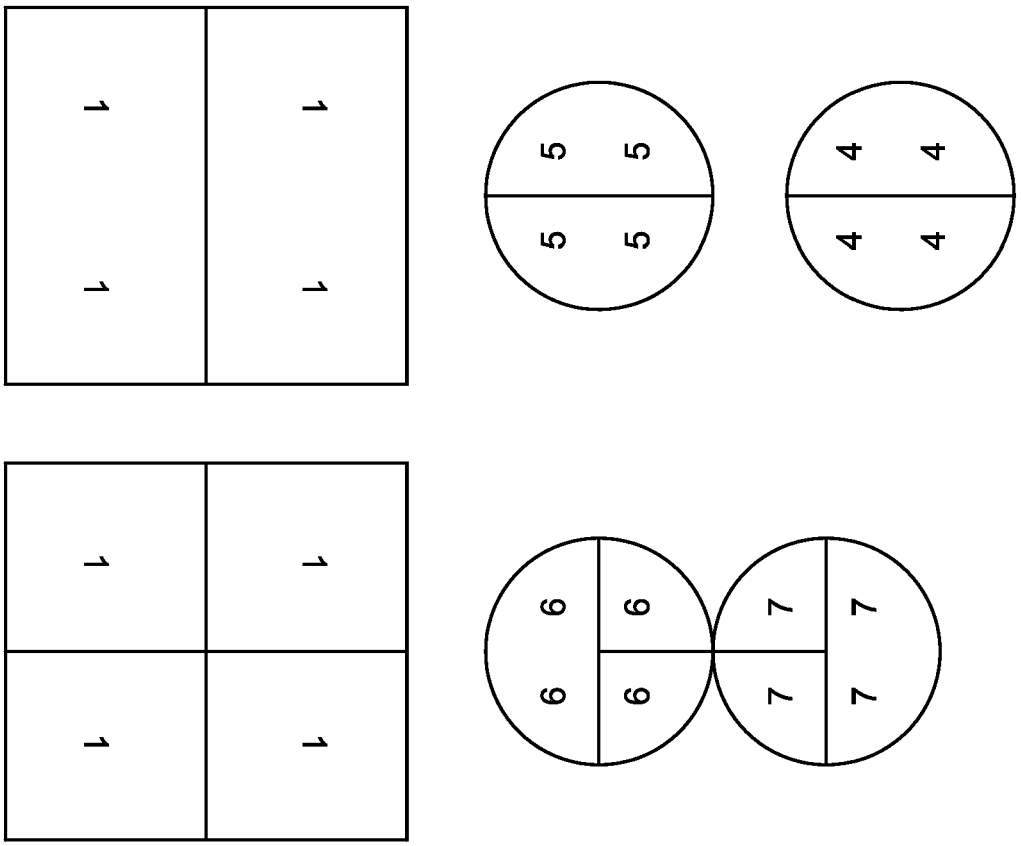

Fig. 15