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(54) PET BOTTLE COUPLER

(76) Inventors: **Yasuharu Manabe**, Tokyo (JP); **Michio Yoshida**, Tokyo (JP); **Maki Nishiyama**, Tokyo (JP)

Correspondence Address:
Snell & Wilmer L.L.P.
1920 Main Street, Suite 1200
Irvine, CA 92614-7230 (US)

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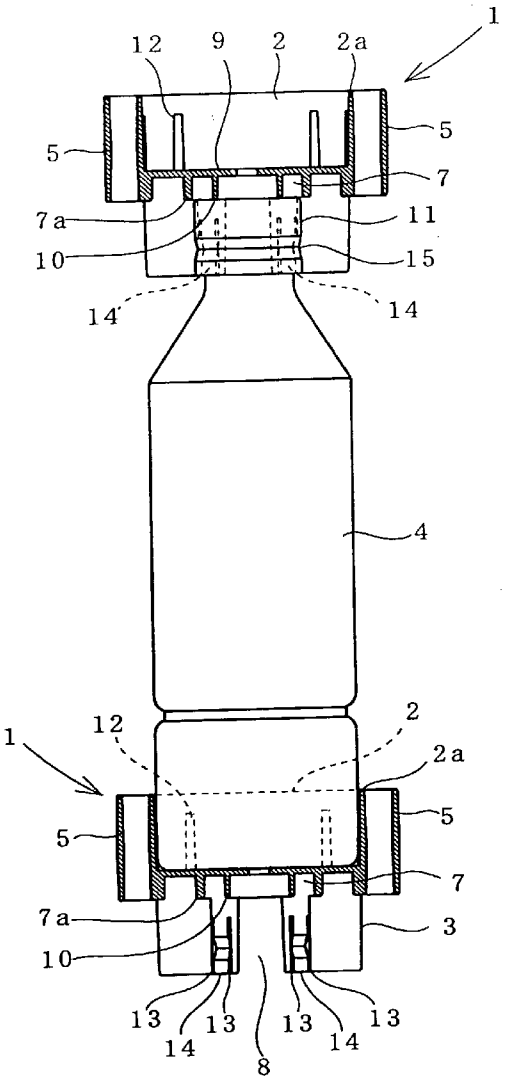
(57) **ABSTRACT**

A block is disclosed which comprises an upper frame portion and a lower leg portion that are integrally formed under the condition that the leg portion fits into the frame portion. The frame portion can be fitted to the bottom portion of a PET bottle and removed from it, the periphery of the frame portion being provided with coupling means that couple together adjacent blocks. The leg portion includes at a center portion thereof a receiving hole into and from which the top portion of a PET bottle is fitted and from which it is removed, the outside of the receiving hole being provided with gaps within which are sandwiched corresponding peripheral walls of the frame portions coupled together by the coupling means.



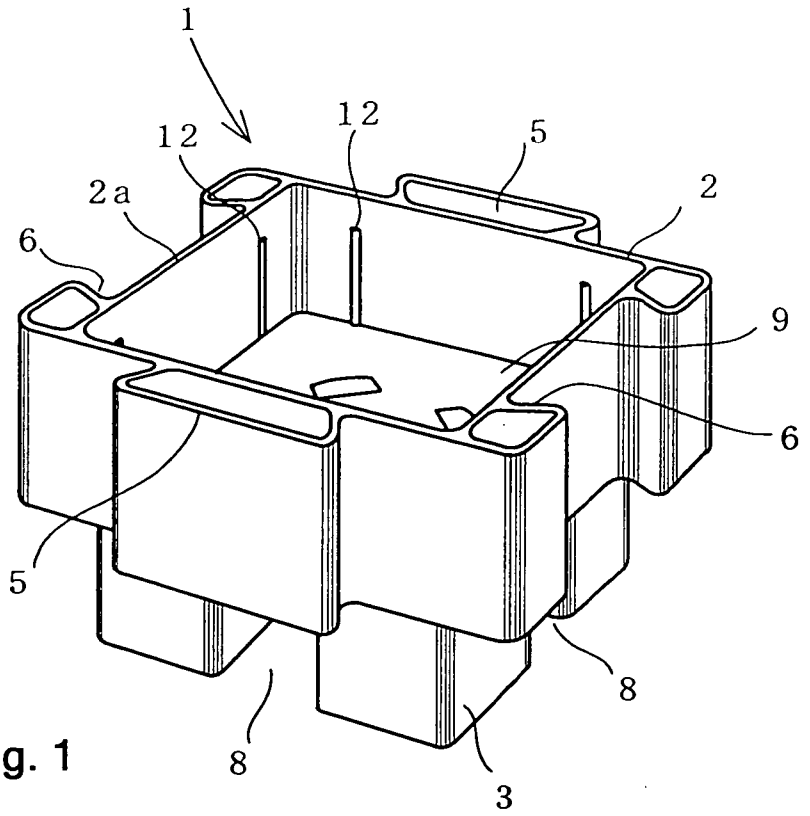


Fig. 1

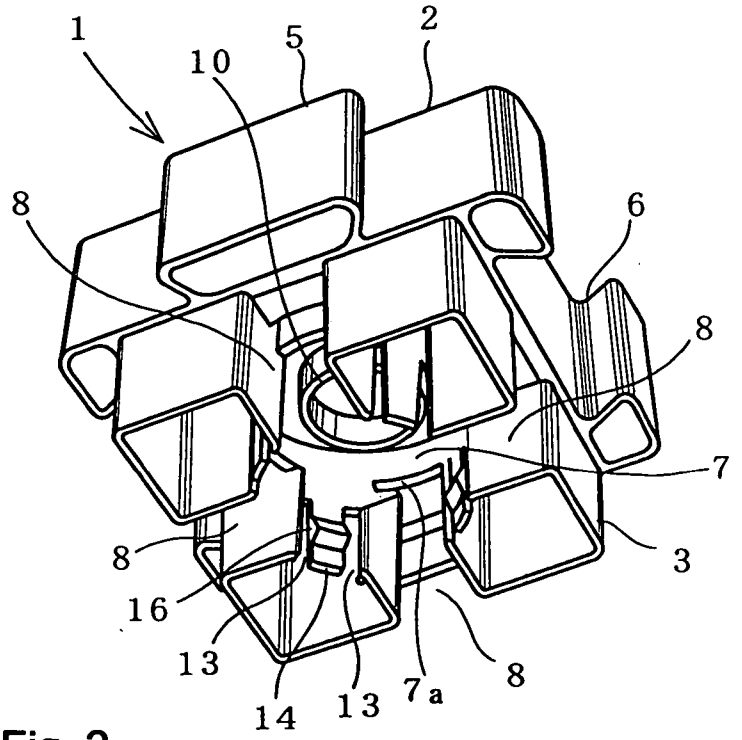


Fig. 2

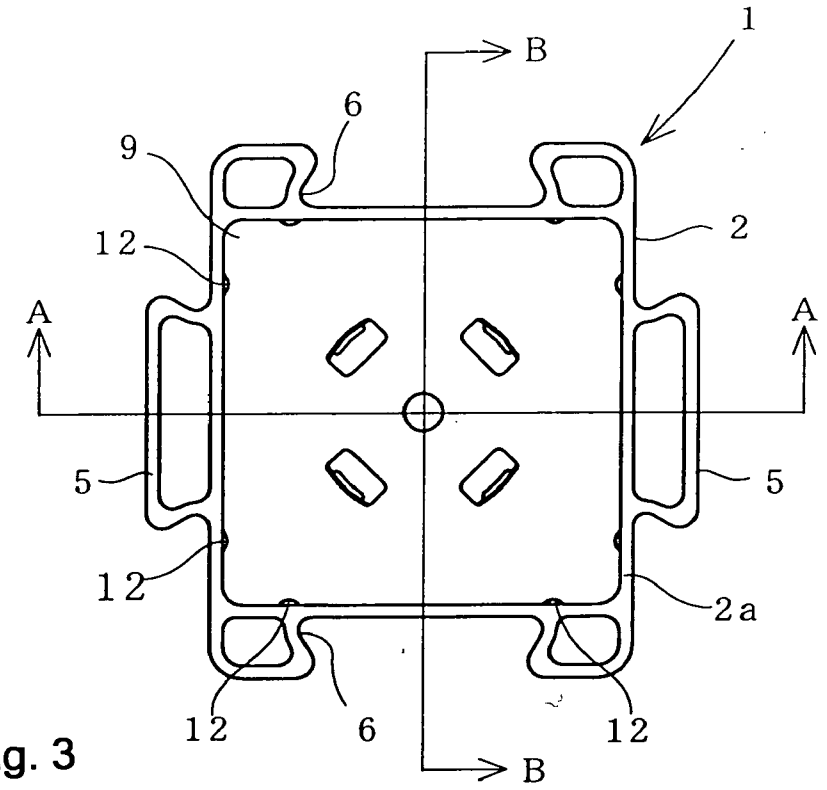


Fig. 3

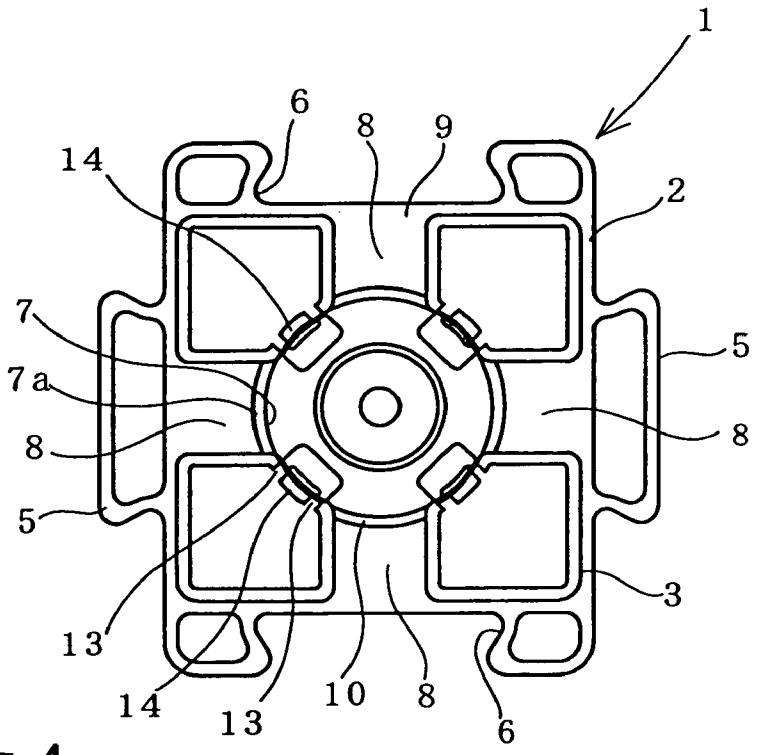
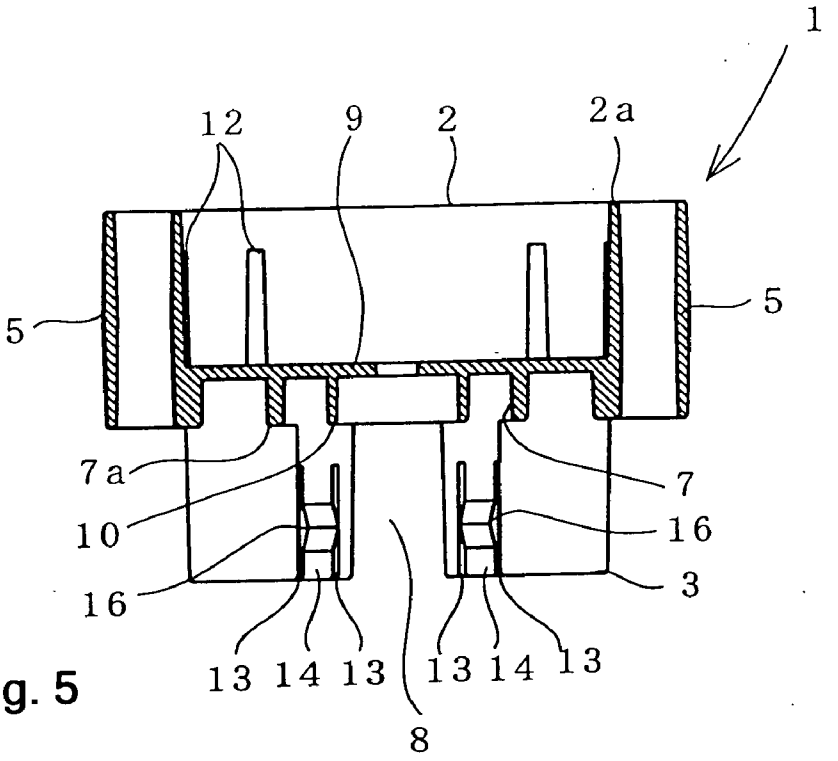


Fig. 4


1
12
9
2
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5
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10
16
7
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3
13 14 13 13 14 13
8

Fig. 5

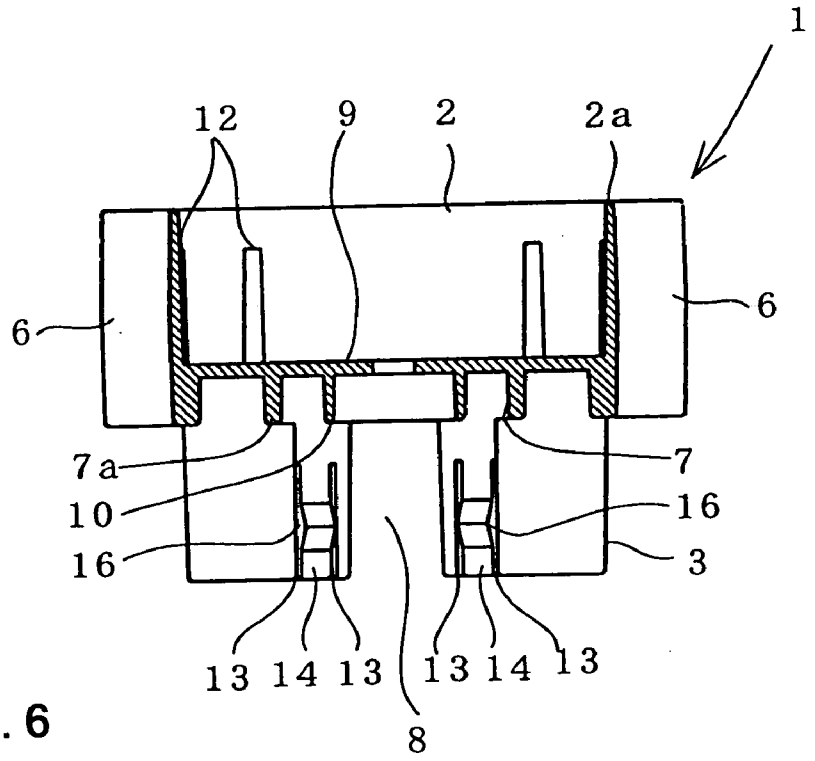
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Fig. 6

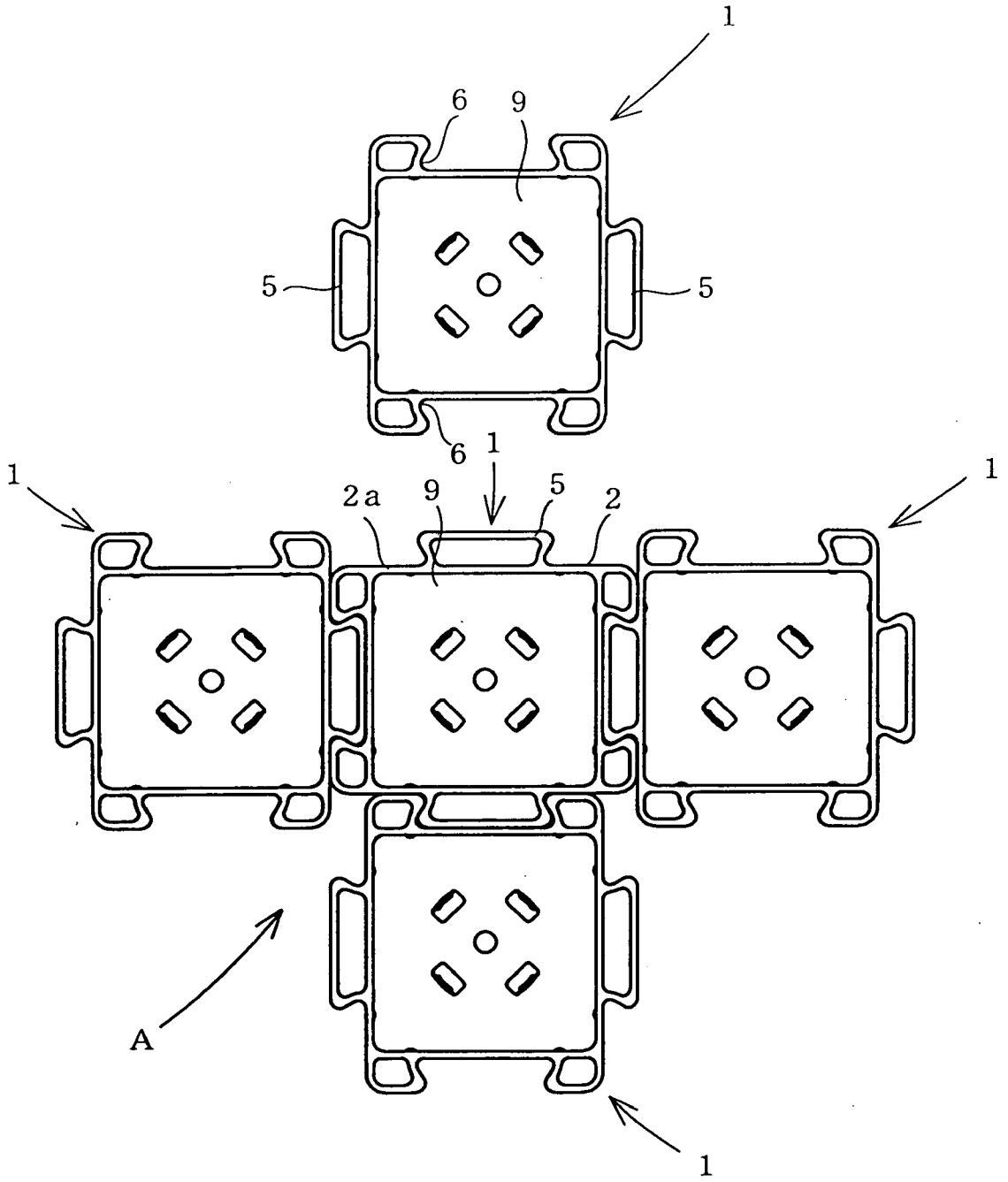

Fig. 7

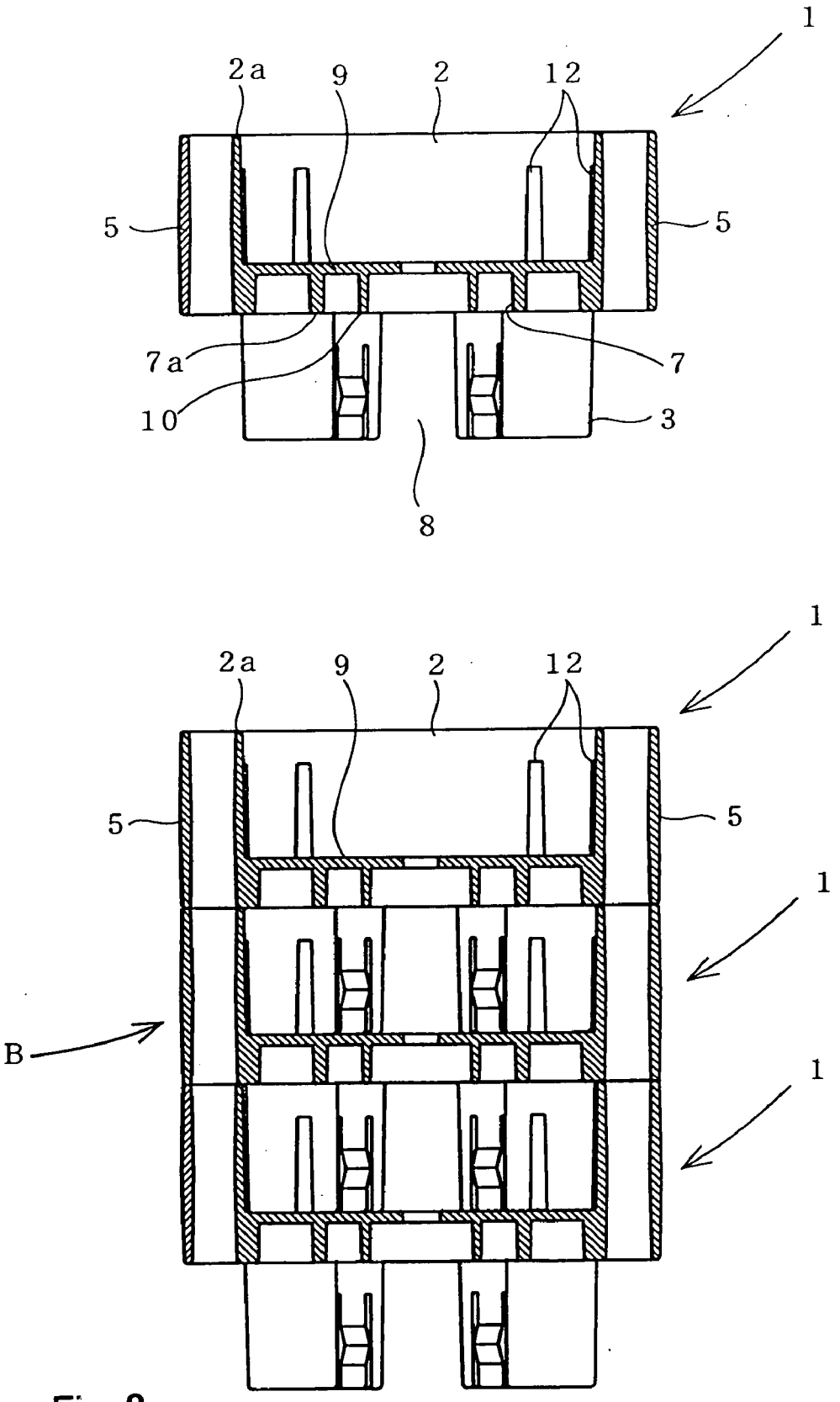

Fig. 8

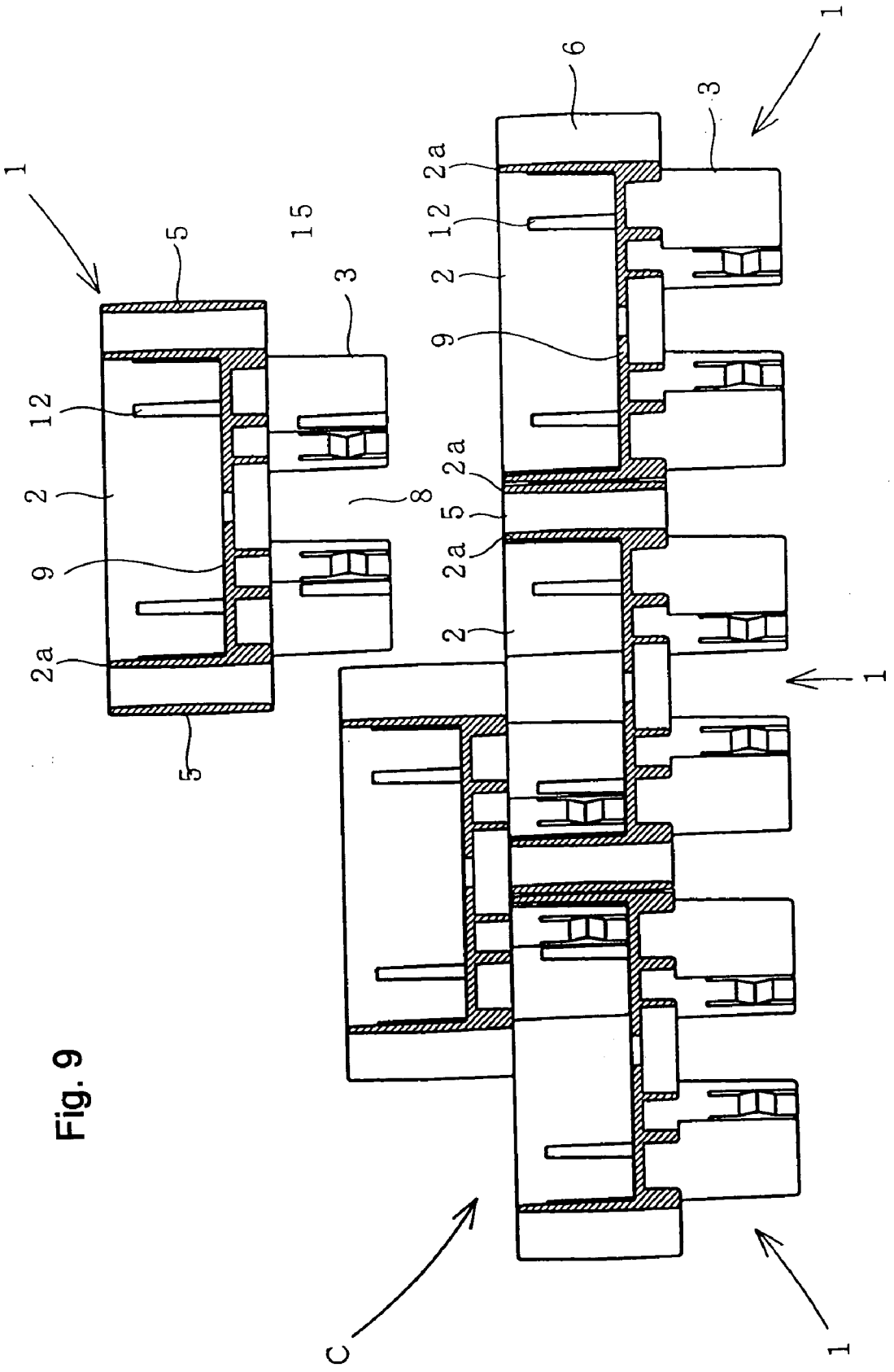

Fig. 9

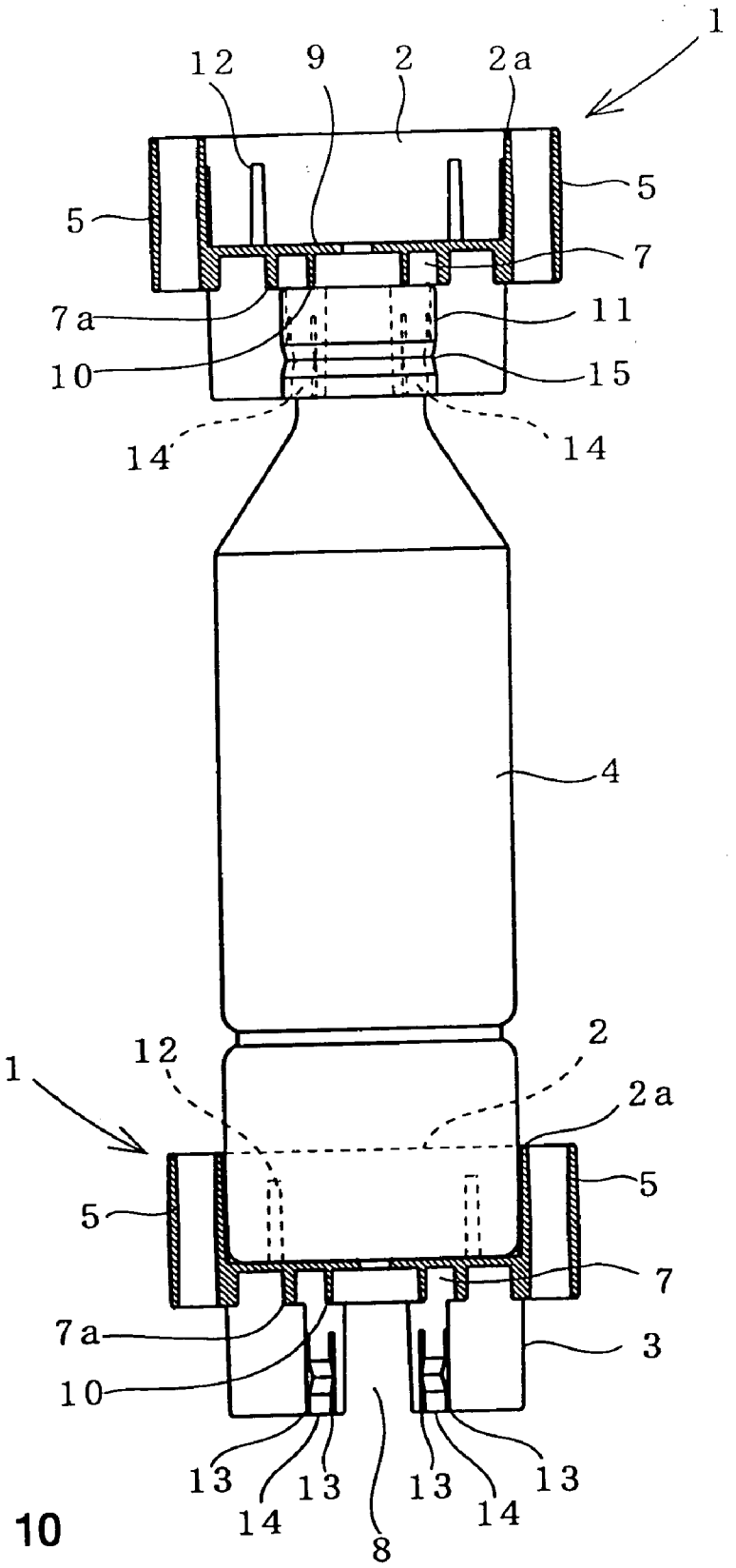
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Fig. 10

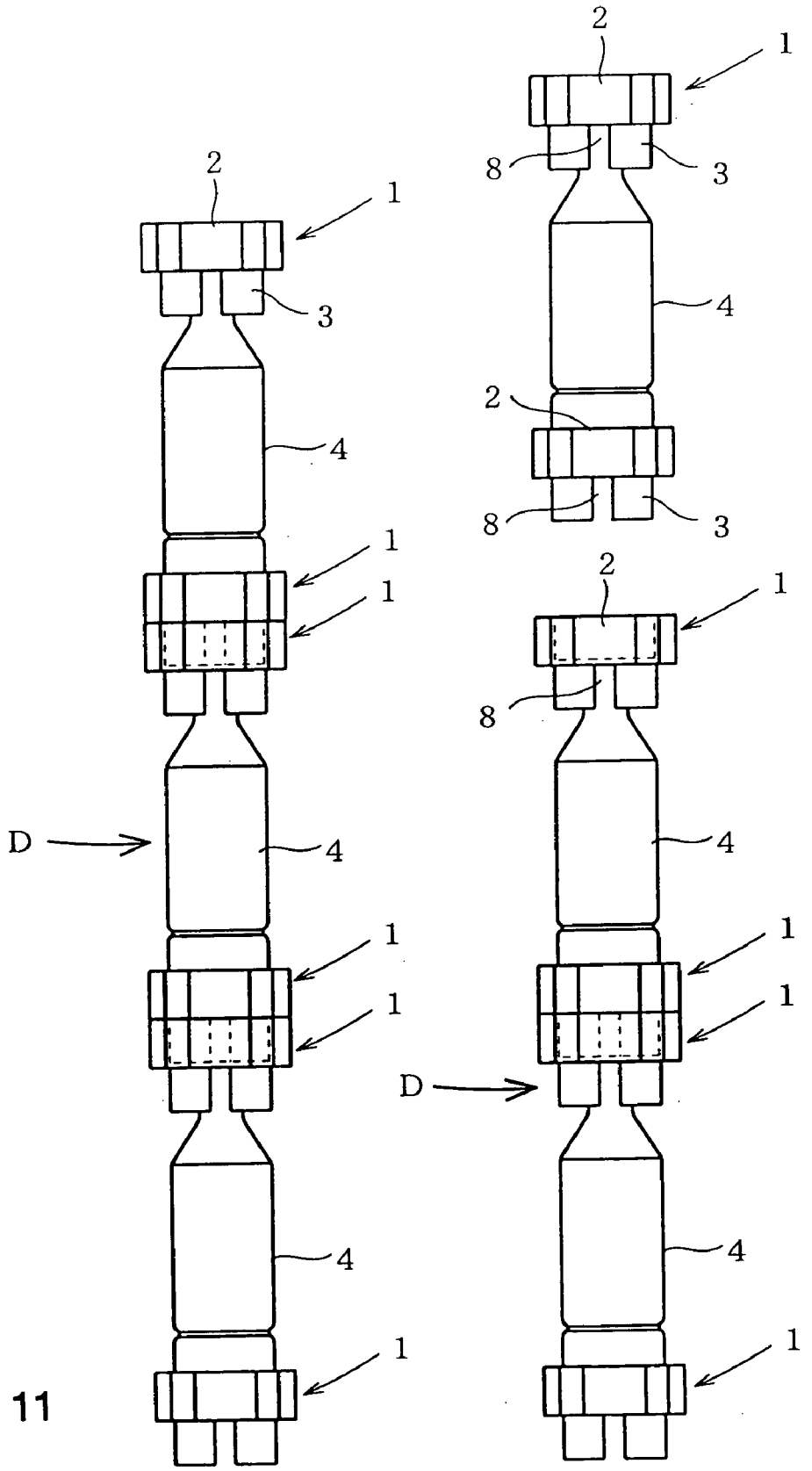

Fig. 11

PET BOTTLE COUPLER

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to blocks with which utensils and toys can be produced in combination with PET bottles by coupling together just the blocks themselves or by attaching and linking the blocks to the PET bottles.

[0003] 2. Description of the Related Art

[0004] Couplers that can be fitted to and removed from bottom portions and top portions of PET bottles in order to utilize used PET bottles as utensils and toys, and which include peripheries disposed with coupling means for coupling together the couplers, are known from a prior application of the present inventors (Japanese Registered Utility Model No. 3099575).

[0005] However, although the couplers can be coupled together in a horizontal direction in a state where they are not attached to PET bottles, they cannot be coupled together in a vertical direction. For this reason, there has been the problem that vertical utensils and toys cannot be produced with just the couplers themselves.

SUMMARY OF THE INVENTION

[0006] It is therefore an object of the present invention to solve this problem by providing blocks with which vertical utensils and toys can be produced by coupling together just the blocks themselves in a horizontal direction or a vertical direction and with which utensils and toys can be produced by attaching the blocks to PET bottles and coupling together the blocks in a vertical direction and a horizontal direction.

[0007] In order to achieve the above object, according to the major aspect of the present invention there is provided a block comprising an upper frame portion and a lower leg portion that are integrally formed under the condition that the leg portion fits into the frame portion, wherein the frame portion can be fitted to and removed from the bottom portion of a PET bottle, the periphery of the frame portion being provided with coupling means that couple together adjacent blocks, and wherein the leg portion includes at a center portion thereof a receiving hole into which the top portion of a PET bottle is fitted and from which it is removed, the outside of the receiving hole being provided with gaps within which are sandwiched corresponding peripheral walls of the frame portions coupled together by the coupling means.

[0008] The blocks can be coupled together in a horizontal direction with the coupling means disposed at the peripheries of the frame portions, and can be coupled together straightly and diagonally (state where one upper block is positioned between two lower blocks) in a vertical direction by fitting together the frame portions and the leg portions. For this reason, flat or vertical utensils and toys can be formed with just the blocks themselves. Moreover, by attaching the blocks to the tops and bottoms of PET bottles, the PET bottles can be coupled in a horizontal direction and a vertical direction by coupling the blocks together to form vertical utensils and toys with PET bottles. Moreover, the blocks can easily be separated and taken apart so that it is easy to make other utensils and toys.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The above and other objects, aspects, features and advantages of the present invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings, in which:

[0010] **FIG. 1** is a perspective view of a top side of a block;

[0011] **FIG. 2** is a perspective view of a bottom side of the block;

[0012] **FIG. 3** is a plan view of the block;

[0013] **FIG. 4** is a bottom view of the block;

[0014] **FIG. 5** is a cross-sectional view along line A-A of **FIG. 3**;

[0015] **FIG. 6** is a cross-sectional view along line B-B of **FIG. 3**;

[0016] **FIG. 7** is a plan view showing a state where the blocks are coupled together in a horizontal direction;

[0017] **FIG. 8** is a longitudinal front view showing a state where the blocks are coupled together in a vertically straight direction;

[0018] **FIG. 9** is a view showing a state where the blocks are coupled together in a vertically diagonal direction;

[0019] **FIG. 10** is a longitudinal front view where the blocks are attached to a top portion and a bottom portion of a PET bottle; and

[0020] **FIG. 11** is a longitudinal side view showing a state where PET bottles, to which the blocks are attached, are coupled together in a vertical direction.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] An embodiment of blocks in accordance with the invention will be described below with reference to the drawings.

[0022] In FIGS. **1** to **6**, reference numeral **1** represents the block of the invention. The block **1** includes an upper frame portion **2** and a lower leg portion **3** that are integrally formed under the condition that the leg portion **3** can be fitted to and removed from the frame portion **2**. The frame portion **2** can be fitted to the lower portion of a PET bottle **4** shown in **FIG. 10**. The frame portion **2** includes a periphery at which coupling means **5** and **6** that couple together adjacent blocks **1** are disposed. A receiving hole **7**, into which the upper portion of the PET bottle **4** can be fitted and from which it can be removed, is disposed in a center portion of the leg portions **3**. Gaps **8**, into which corresponding peripheral walls **2***a* of the frame portions **2** coupled by the coupling means are fitted, are disposed at an outer side of the receiving hole **7**. The leg portion **3** is formed by molding synthetic resin.

[0023] In a case where the PET bottle **4** has a square shape, the block **1** is formed in a square shape matching the square PET bottle **4**, a horizontal-direction divider **9** is disposed between the upper frame portion **2** and the lower leg portions **3** and, as shown in **FIGS. 4, 5** and **6**, a circular convex ridge

10 corresponding to a top surface of a cap **11** covering the top portion of the pet bottle **4** is disposed at an undersurface of the divider **9**.

[**0024**] As shown in **FIGS. 1, 3, 5** and **6**, two locking convex ridges **12** that engage with the peripheral surface of the bottom portion of the PET bottle **4** are disposed in the vertical direction at the inner side of each peripheral wall **2***a*. At the outer side of the peripheral walls **2***a* are disposed male coupling means **5**, which couple the blocks **1** together in a horizontal direction and correspond to the left and right sides in **FIG. 3**, and female coupling means **6** that correspond to the top and bottom sides in **FIG. 3**. The male coupling means **5** have a dovetail groove shape and the female coupling means **6** have a dovetail tenon shape.

[**0025**] The receiving hole **7** for the pet bottle **4** disposed in the leg portion **3** is divided into four by the gaps **8** excluding the top portion of the receiving hole **7**. As shown in **FIGS. 2 and 4**, cuts **13** are placed in a peripheral wall **7***a* of the receiving hole **7** to form movable portions **14** that are capable of elastic deformation. As shown in **FIG. 10**, locking convex portions **16** that engage with recessed portions disposed in the cap **11** covering the pet bottle **4** are disposed in the horizontal direction at the movable portions **14**.

[**0026**] It should be noted that, as shown in **FIG. 2**, the leg portion **3**, the dovetail tenon-shaped coupling means **5** and the dovetail groove-shaped coupling means **6** of the block **1** of the present invention can be formed into a hollow structure and can be produced so that they are lightweight and inexpensive.

[**0027**] As shown in the top half of **FIG. 7**, horizontally adjacent blocks **1** can be arranged so that the male coupling means **5** and the female coupling means **6** disposed at the peripheral walls **2***a* of the frame portions **2** face each other. By fitting together the male and female coupling means **5** and **6**, as shown in the bottom half of **FIG. 7**, the blocks **1** are coupled together in a horizontal direction by the coupling means **5** and **6** to form a flat block group A.

[**0028**] Also, as shown in the top half of **FIG. 8**, vertically adjacent blocks **1** can be arranged so that the frame portions **2** and the leg portions **3** face each other. By fitting together the frame portions **2** and the leg portions **3**, as shown in the bottom half of **FIG. 8**, the blocks are straightly coupled together in a vertical direction by the coupling resulting from the fitting together of the frame portions **2** and the leg portions **3** to form a vertical block group B.

[**0029**] Moreover, as shown in **FIG. 9**, a coupled portion between two adjacent blocks **1** of the flat block group A, which is formed by horizontally coupling together the blocks **1**, is created. Another block **1** is disposed above the coupled portion so that the gaps **8** of the leg portion **3** correspond to the coupled portion. As shown in the bottom left half of **FIG. 9**, the corresponding peripheral walls **2***a* engage with the gaps **8** so that the peripheral walls **2***a* are sandwiched in the gaps **8**, whereby coupling in a diagonally vertical direction in which the top block **1** is coupled to the coupled portion of the bottom two blocks **1** is conducted. In this case, a vertical block C having a width and height is formed.

[**0030**] Thus, by individually coupling, or coupling in combination, the blocks **1** forming the block group A, the block group B or the block group C, various types of utensils and toys can be easily formed with the blocks **1**.

[**0031**] Next, as shown in **FIG. 10**, the blocks **1** can be attached to the top portion and the bottom portion of the PET bottle **4** because the blocks **1** are configured so that the bottom portion of the PET bottle **4** fits into the upper frame portion **2** and the top portion of the PET bottle **4** fits into the receiving hole **7** of the lower leg portion **3**. Thus, as shown in **FIG. 11**, the PET bottles **4** to which the blocks **1** are attached at the top and bottom can be arranged in a vertical direction. As shown at the top right of **FIG. 11**, the leg portions **3** of the block **1** attached to the bottom portion of the top PET bottle **4** are aligned with the frame portion **2** of the block **1** attached to the top portion of the bottom PET bottle **4**. By fitting the two together, as shown in the bottom half and left row of **FIG. 11**, the PET bottles **4** can be straightly coupled together in a vertical direction by the blocks **1** to form a PET bottle group D.

[**0032**] As described above, by fitting together the male and female coupling means **5** and **6** disposed at the frame portions **2** of the blocks **1**, the vertically coupled PET bottle groups D can be coupled together in the horizontal direction to have a planar breadth. Thus, by devising various ways of coupling the blocks **1**, utensils and toys of various vertical shapes can be formed with the PET bottles **4**.

[**0033**] The blocks of the present invention can be applied to form utensils and toys by coupling together just the blocks themselves and can be applied to form utensils and toys with PET bottles by attaching the blocks to PET bottles and coupling together the blocks.

[**0034**] While illustrative and presently preferred embodiments of the present invention have been described in detail herein, it is to be understood that the inventive concepts may be otherwise variously embodied and employed and that the appended claims are intended to be construed to include such variations except insofar as limited by the prior art.

1. A block comprising an upper frame portion and a lower leg portion that are integrally formed under the condition that the leg portion fits into the frame portion, wherein

the frame portion can be fitted to and removed from the bottom portion of a PET bottle, the periphery of the frame portion being provided with coupling means that couple together adjacent blocks, and wherein

the leg portion includes at a center portion thereof a receiving hole into and from which the top portion of a PET bottle is fitted and removed, the outside of the receiving hole being provided with gaps within which are sandwiched corresponding peripheral walls of the frame portions coupled together by the coupling means.

2. A block as claimed in claim 1, further comprising locking convex ridges that engage with the peripheral surface of said bottom portion of said bottle and are disposed in the vertical directions of said peripheral walls of said upper portion.

3. A block as claimed in claim 1, further comprising cuts placed in a peripheral wall of said receiving hole to form movable portions capable of elastic deformation and locking convex portions that engage with recessed portions disposed in a cap covering said bottle and are disposed at said movable portions.

4. A combination coupler block and bottles that are removably attached together comprising:

a pair of bottles having respectively upper pouring portion and lower container walls and;

a coupler block having a first surface with a cavity of a size and configuration to removably secure the bottle container walls and a second surface to removably engage and return the upper pouring portion of the bottle.

5. The invention of claim 4 further comprising a third surface on the coupler block for interlocking with another coupler block.

6. The invention of claim 5 wherein the third surface is one of a male and female dove shaped connector.

7. The invention of claim 4 wherein the second surface includes a plurality of cantilevered tines for engaging the upper pouring portion.

8. The invention of claim 4 wherein the second surface is of a perimeter configuration to securely fit into the cavity of the first surface to enable a stacking connection of coupler blocks.

9. The invention of claim 4 wherein the first surface includes a plurality of locking ridges extending into the cavity for securing the container wall.

10. A coupler block set that can be combined to construct objects alone or in combination with bottles that are removably attached together having respectively an upper pouring portion and a lower container wall comprising:

a coupler block having a first surface with a cavity of a size and configuration to removably secure the bottle container wall, a second surface to removably engage and retain the upper pouring portion of the bottle and a third surface on the coupler block for interlocking with another coupler block.

11. The invention of claim 10 wherein the third surface is one of a male and female dove shaped connector.

12. The invention of claim 11 wherein the second surface includes a plurality of cantilevered tines for engaging the upper pouring portion.

13. The invention of claim 12 wherein the second surface is of a perimeter configuration to securely fit into the cavity of the first surface to enable a stacking connection of coupler blocks.

14. The invention of claim 11 wherein the first surface includes a plurality of locking ridges extending into the cavity for securing the container wall.

* * * * *