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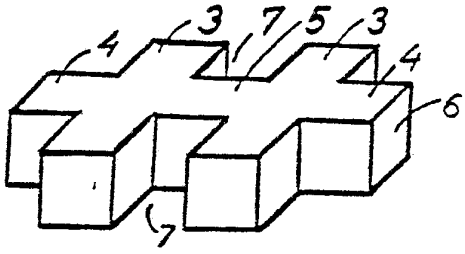
(57) Abstract



An assembly unit (1) particularly suited for a toy, but which may also be used for decoration and hobby use and other purposes. The particular advantage of the unit is that it may be assembled with any number of identical units (1), thereby creating coherent, continuous planes and three-dimensional structures. This is achieved by the assembly unit being shaped as a double cross with an elongated rectangular trunk (2), the width of which is one-fifth of the length of the trunk. On the trunk (2) is positioned four side branches (3), in pairs on each side of the trunk, at a distance equal to the width of the trunk from the ends (6) of the trunk, thereby forming an opening (7) on each side of the trunk, with a width equal to the width of the trunk. In a particularly expedient embodiment the assembly unit (1) has a height equal to the width of the trunk. This makes possible the assembly of very stable threedimensional combinations of structures, especially if the units are made of a resilient material such as blow molded polyethylene. The assembly units can be used for an assembly set consisting exclusively of assembly units of identical shape, but complementary assembly units (11, 12) are also possible. The assembly units may also be made of hard materials such as tile, brick and concrete to serve other purposes.

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ASSEMBLY UNIT AND ASSEMBLY SET

FIELD OF INVENTION

This invention relates to an assembly unit particularly suited for a toy, which is shaped as an elongated rectangular trunk with four square side branches positioned in pairs on each side of the trunk.

DISCUSSION OF PRIOR ART

Assembly units for toys, decorations, hobby use and other uses are known in various embodiments. But only in a few cases can such units be assembled exclusively with exactly similar units in any number to become a coherent and continuous (flat) surface, and out of these assembly units even fewer can also be assembled with identical units into stable three-dimensional structures.

SUMMARY AND OBJECTS OF THE INVENTION

The assembly unit according to this invention is caracterized by the width of the trunk being one-fifth of the length of the trunk; and the side branches being positioned with a spacing corresponding to the width of the trunk; and the width of each side branch, and the respective side branches also being positioned at this distance from the ends of the trunk.

The base plane of the assembly unit is a double cross with an elongated rectangular stem, the width of which is a module which is one-fifth of the length of the elongated rectangular stem. Attached to the stem are, on each side of the stem, two square side branches. The length and width of the squares are equal to the width of the stem. The squares are positioned on the stem with a spacing equal to the width

of the stem and at a distance from the ends of the stem equal to the width of the stem.

The four side branches, the two end parts of the trunk measured up to the side branches hereafter called end pieces, and the middle part of the stem between the side branches hereafter called the middle part, are congruent and for all practical purposes of the same size and shape as the space between the side branches, hereafter called the opening. Either of the two openings on each assembly unit will, therefore, each be able to accept a side branch or end piece of a similar assembly unit when the assembly units are placed with their bases either parallel or perpendicular to each other.

The openings of two assembly units placed perpendicular to each other may also be pushed close together over each other's middle part, resulting in still other possibilities of assembly. It is, therefore, possible to obtain a tightly assembled structure from any number of similar assembly units according to the invention with both coherent flat surfaces and different three-dimensional structures of unlimited variations.

A particularly expedient embodiment of the assembly unit of the invention consists of an assembly unit which has its height, which is the distance between the two parallels base planes, equal to the width of the trunk. In this embodiment, the side branches, the end pieces, the middle part and the openings are for all practical purposes identical and of a cubical shape. This will highly stabilize the assembled structure, particularly when it is three-dimensional, and will significantly improve the use of the assembly units for an assembly set of only similar assembly units of the invention.

In order to obtain a good stable assembly of the assembly units, it is necessary to make the units with accurate dimensions; otherwise the units either cannot be assembled or will fall apart. In order to make easy assembly, the edges and corner used in the assembly must be suitably rounded,

and the units must be made of a fairly smooth material. When the units are used for toys, it is also important that the units can easily be disassembled.

In order to fulfil all the above requirements materials and shape must be carefully chozen and exact dimensions used. The units may suitably be made of a resilient material. For example, a thermoplastic such as polyethylene. In such case the cubes which make up the side branches, the end pieces and the middle parts can be slightly larger than the openings, in order to create a tension to improve the stability of the assembly. In order to increase the resilience and also save material it is possible to produce the units hollow, for example by a process of blowmolding. Particularly well suited is the method of blowmolding which leaves the surface of the unit whole, because the units then can float even after being submerged in water. This will expand the uses of the units to, for example, playing in the bathtub and on the beach.

In order to improve the resilient cohesion of the units, it is possible to manufacture the units in such a way that the walls of the side branches, the end pieces and the middle parts, which are meant to be connected, bulge outwards in such a way that the units have their largest cross-sectional area midway between the base planes. It is also possible to produce the units in such a way that the walls of the side branches, the end pieces and the middle parts, which are meant to be connected, have protrusions or patterns, for example ridges which are parallel with one or both of the sides of the walls, or small barbed undercuttings that would improve the adhesion without making disassembly excessively difficult.

The assembly unit may also be made of less resilient materials such as wood, tile, brick or concrete. In such case the cubical shapes which make up the end pieces, the side branches, and the middle parts can suitably be made somewhat smaller than the openings. In order to get a suitable cohesion in these cases it is possible to place means

to keep the units tight to each other in the narrow slits between the walls of the assembled units. These means may, for example, be flat pieces of cardboard, plastic foam, plastic film or similar materials, whith the shape of a square having the length of each side equal to the width of the trunk. In case the assembled structure should be saved, the means may be glue or cement.

The described set of assembly units of the invention provides many variations of assembled patterns and structures, particularly if a large amount of units in different colors are available.

It is also possible that the set of assembly units may include assembly units of shapes different from that of the unit of the invention, suitably of the same height as the unit of the invention and including protrusions and openings of the same size and format as those of the unit of the invention. Some examples of such complementary units, that may suitably be used to complete the structure when assembling rectangular plane patterns, are illustrated in the drawing.

The invention, therefore, also relates to a set of assembly units in which these complementary units occur among the originally described units, the latter units constituting a significant amount of the units, for example in relation to area, amount or consequense.

BRIEF DESCRIPTION OF THE DRAWING

The drawing illustrates an assembly unit according to the invention.

Figure 1 shows the unit from above. Figure 2 shows the unit in perspective. Figure 3 shows the unit from the side. Figure 4 shows an alternative embodiment of the unit seen from the side. Figure 5 shows two units assembled at right angles to each other. Figure 6 shows a plane pattern of assembled elements seen from above. Figure 7 shows a different plane pattern of assembled elements seen from above.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIGURE 1 shows the base plane of a unit 1 according to the invention. And in this Figure horizontally placed trunk 2 has four identical side branches 3 which are also identical to the two end pieces 4 of the trunk and the middle part 5 of the trunk. The side branches 3 have been placed at a distance which is equal to the width of the trunk 2 from the nearest end 6 of the trunk 2. The width of the trunk 2 is one-fifth of the length of the trunk 2.

FIGURE 2 shows in perspective a particularly suitable embodiment of the unit 1, where the height of the unit is equal to the width of the trunk. Because of this relation the side branches 3, the end pieces 4 and the middle part 5 and the two openings 7 are all of the same cubical shape and size. This is also shown in FIGURE 3 which shows the unit 1 from the side. Whereas FIGURE 3 shows the ideal shape FIGURE 4, which likewise shows the unit 1 from the side, shows an example of the slightly bulging walls 8 which are meant to increase the resilient cohesion between the units 1 when the walls 8 are placed in the openings 7. FIGURE 4 further illustrates that the unit 1 may be composed of two identical half parts 9 and 10.

FIGURE 5 shows two identical units 1 that have been assembled at right angles to each other, for example, as the beginning of a larger three-dimensional structure.

FIGURE 6 shows the most common assembly of the units 1 to a coherent continous plane. Also shown are examples of complementary units 11 and 12 belonging to the set of assembly units, in the shape of an F and a T respectively. Such complementary units can also for all practical purposes be viewed as being in the shape of a number of connected cubes, with the length of a side of a cube equal to the width of the module, being the width of the trunk.

In FIGURE 7 is shown another type of assembly of the units 1 creating a coherent plane. Here the units in the rows marked 13 are attached to each other, and the units

in the row marked 14 are attached to each other, but the two rows 13 and 14 are not attached to each other but only placed close to each other. In this situation and in other situations, units of other shapes could advantageously be used.

The invention is not limited to the embodiments shown in Figures 1 to 7. Also, units may be produced from other materials such as metal and plastic foam, and by other methods than those already mentioned. For example, by injection molding or thermo-forming. The units may also have shapes that depart somewhat from the shown ideal shape, and the units may possibly lack one of the walls of the base planes, in which case they are more easily produced by thermo-forming. Also, the complementary units may be of shapes completely different from the shown complementary units, for example provided with heads and arms.

The units according to the invention may also be used for other purposes than the mentioned. Besides being used as a toy, the units of two different colors may suitably be used for various types of games, for example "tick-tack-toe". The advantage of using the units in board games is that the units can be used both as the board and the ponds. The units may also be decorated and have glued-on pictures so that they can be used as puzzles. As decorations the units can, in different combinations, be used in both stores and the home for, for example, Christmas decorations and mobiles.

For artisan and hobby use, the units may be made of altogether different materials and be used for tiles, lawn tiles, shelves and brackets and so on. The units may also be used for educational purposes, from models of atoms to educational means for development of the sense of space, creativity, sense of combination and sense of color.

Planes of assembled units may also be used for the purpose of insulation. In order to expand the use of the units of the invention as a toy, it is possible to adapt the size of the units to fit other assembly toys on the market, in such a way that the other toys may be fitted

to the opening of the units of the invention. In this way combinations of different assembly toys can be made which mutually increase the value of each other. For example, the structure made of the combined assembly sets may be able to float on water because of the special properties of the units of the invention.

CLAIMS

1. An assembly unit, particularly suited for a toy, which is shaped as an elongated rectangular trunk with four rectangular side branches positioned in pairs on each side of the trunk, characterized by the width of the trunk being one-fifth of the length of the trunk, and the side branches being positioned with an opening corresponding to the width of the trunk and the width of each side branch; and the respective side branches also being positioned at this same distance from the ends of the trunk.

2. An assembly unit according to claim 1, characterized by the height of the unit being equal to the width of the trunk of the unit.

3. An assembly unit according to claim 1, characterized by the unit being made of a resilient material, for example a thermo-plastic material such as polyethylene, suitably made hollow as for example by blowmolding or by fusion of two identical parts in which the opening between two side branches may suitably be slightly narrower than the width of the side branches, the end pieces and the middle part.

4. An assembly unit according to claim 1, characterized by the side branches, the end pieces and the middle part being slightly bulging outward and convex on the walls of its sides.

5. An assembly unit according to claim 1, characterized by the walls which are meant to be connected having protrusions or patterns, for example ridges which are parallel with one or both of the sides of the walls.

6. An assembly unit according to claim 1, characterized by the outer wall of the unit being impermeable to water.

7. An assembly unit according to claim 1, characterized by the material that the unit is made of being of a less resilient or hard material such as tile, brick or concrete, and in which the narrow slit between to side branches is preferably somewhat wider than the width of the side branches, the end pieces and the middle part.

8. Assembly set comprising assembly units according to claim 1, characterized by the assembly set only comprising or essentially only comprising assembly units according to claim 1.

9. Assembly set according to claim 8, characterized by the assembly unit including means to get a suitable cohesion between the units, by placing the means, which may for example be flat pieces of cardboard, plastic foam, plastic film, glue and/or cement, in the narrow slits between the walls of the assembly units.

10. Assembly set according to claim 8, characterized by the set comprising complementary assembly units.

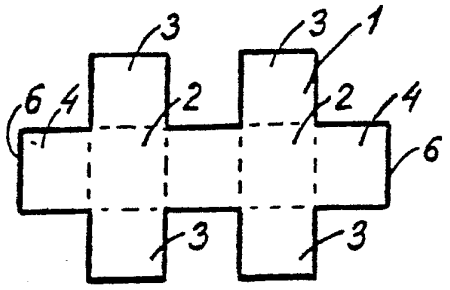

Fig. 1

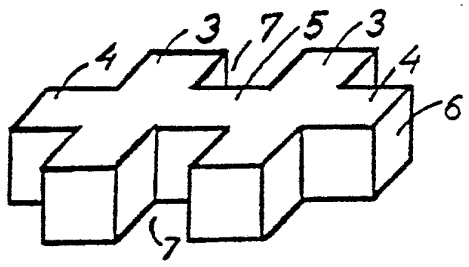

Fig. 2

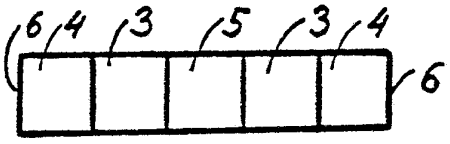

Fig. 3

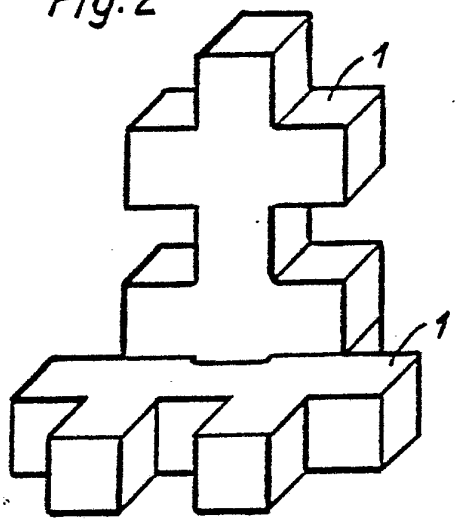

Fig. 5

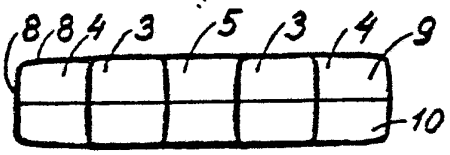

Fig. 4

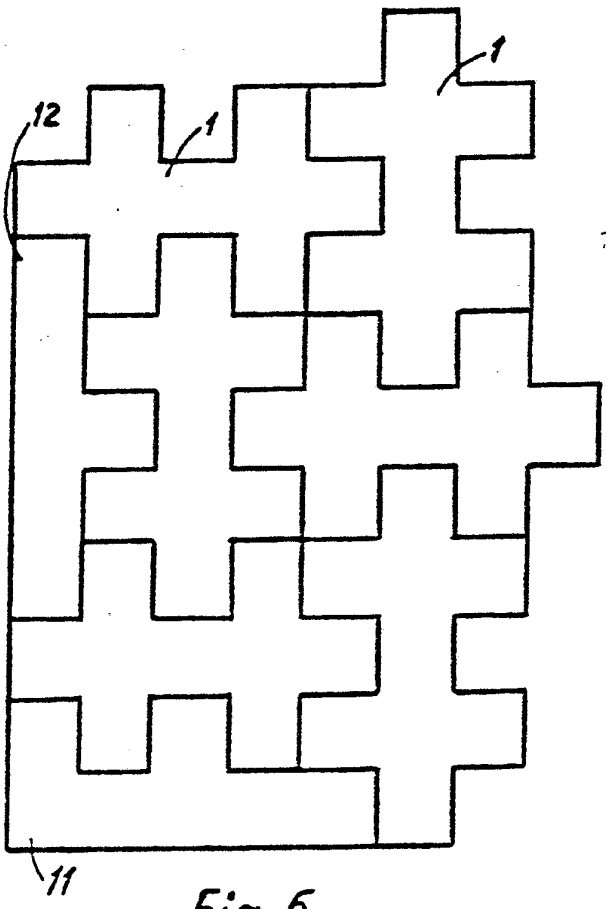

Fig. 6

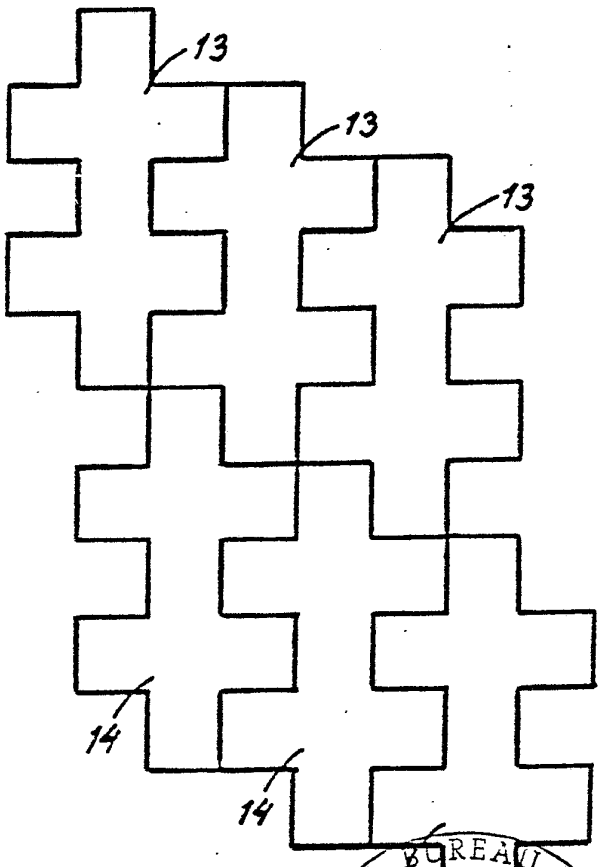

Fig. 7

INTERNATIONAL SEARCH REPORT

International Application No PCT/DK82/00002

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC 3

A 63.H 33/08

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC 3	A 63 H 33/00-08
National Cl	77f:33/00-08
US Cl	46:17-31

Documentation Searched other than Minimum Documentation to the Extent that such Documents are included in the Fields Searched [5]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
A	DE, C, 670 756 (H IHLE) 24 January 1939	1-10
A	DE, C, 727 517 (K SCHIFFLER) 5 November 1942	1-10
A	DE, C, 805 135 (C CARLBERG) 7 May 1951	1-10
X	FR, A, 2 006 187 (F ANTONIO) 19 December 1969	1-10
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IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
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Swedish Patent Office	Manfred Weiss