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(54) **ASSEMBLY SET.**

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Description

The invention relates to an assembly set, particularly suited as a toy, comprising a plurality of substantially geometrically identical assembly units, each having a base plane which is a double cross with an elongate rectangular trunk on each side of which are attached two side branches.

Assembly units for toys, decorations, hobby use and other uses are known in various embodiments. But only in a few cases such units can be assembled exclusively with exactly identical units in any number to form a coherent and continuous (flat) surface. In FR—A—2 006 187 an assembly set of identical units is disclosed. The base plane of each unit is a square with one hole in the middle of the unit and with two side branches on each side of the square. But even if there were no holes, a plurality of these units will not be able to form a coherent and continuous surface. From US—A—3 660 928 a set of building units is known including five basic inter-related units. The base plane of one of these units is a double cross with an elongated, rectangular trunk on each side of which two side branches are attached. A plurality of identical units of this type cannot be combined to form a coherent and continuous surface.

The assembly set according to the invention is characterized in that the width of the trunk is one fifth of the length of the elongate rectangular trunk, in that the side branches are square shaped with a side length equal to the width of the trunk, and in that the side branches are positioned on the trunk at a spacing substantially equal to the width of the trunk and at a distance from the ends of the trunk equal to the width of the trunk.

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 trunk between the side branches hereafter called the middle part, are congruent and for all practical purposes of the same size and shape as the spacing between the side branches. Either of the two spacings 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 spacings 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 spacings 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 set.

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 should be suitably rounded, and the units should 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 chosen 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 spacings, 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 blow molding or by fusion of two identical parts molding. Particularly well suited is the method of blow molding 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 assembly set 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, with 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 assembly set 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 assembly set may include further assembly units of shapes different from that of the principal unit, suitably of the same height as the principal unit and including protrusions and spacings of the same size and format as those of the principal unit. Some examples of such complementary units, by means of which the finished assembly may be given straight sides 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 principal units, the latter units constituting a significant amount of the units, for example in relation to area, amount or consequence.

The drawing illustrates assembly units for an assembly set according to the invention.

Figure 1 shows a unit from above.

Figure 2 shows the assembly 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 units seen from above.

Figure 7 shows a different plane pattern of assembled units seen from above.

Figure 1 shows the base plane of a single assembly unit 1 for an assembly set according to the invention. In this Figure a 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 way of combining the units 1 into a coherent continuous 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, which in turn is 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.

The invention is not limited to the embodiments shown in Figures 1 to 7. Also, units for the assembly set 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 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 both in stores and in the home, for example, for 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, ranging 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 into the spacings 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 assembly set units of the invention.

Claims

1. An assembly set, particularly suited as a toy,

comprising a plurality of substantially geometrically identical assembly units (1), each having a base plane which is a double cross with an elongate rectangular trunk (2) on each side of which are attached two side branches (3), characterized in that the width of the trunk (2) is one fifth of the length of the elongate rectangular trunk (2), in that the side branches (3) are square shaped with a side length equal to the width of the trunk (2), and in that the side branches (3) are positioned on the trunk (2) at a spacing (7) substantially equal to the width of the trunk (2) and at a distance from the ends of the trunk (2) equal to the width of the trunk (2).

2. An assembly set according to claim 1 characterized in that the height of each assembly unit (1) is equal to the width of the trunk (2) of the assembly unit (1).

3. An assembly set according to claim 1 or 2 characterized in that each assembly (1) is made of a resilient material, for example a thermo-plastic material such as polyethylene, suitably made hollow as for example by blow molding or by fusion of two identical parts (9, 10), and that the spacing (7) between two side branches (3) is slightly narrower than the width of the trunk (2).

4. An assembly set according to claim 1, 2 or 3 characterized in that the side branches (3), as well as the end pieces (4) and the middle part (5) of the trunk (2) of each assembly unit (1) bulge slightly outwards and are convex on the side walls thereof.

5. An assembly set according to any of the preceding claims characterized in that the walls which are meant to be connected having protrusions or patterns, for example ridges parallel with one or both of the sides of the walls.

6. An assembly set according to any of the preceding claims characterized in that the outer wall of each assembly unit (1) is impermeable to water.

7. An assembly set according to claim 1, 2, 4, 5 or 6 characterized in that each assembly unit (1) is made of a less resilient or hard material such as tile, brick or concrete, and in that the spacing (7) between two side branches (3) is preferably somewhat wider than the width (3) of the trunk (2).

8. Assembly set according to any of the preceding claims characterized in that the assembly unit (1) includes means, for example flat pieces of cardboard, plastic foam, plastic film, glue and/or cement, to obtain a suitable cohesion between the units (1), said means being placed in the narrow slits between the walls of the assembly units (1).

9. Assembly set according to any of the preceding claims characterized in that it comprises supplementary assembly units (11, 12).

Patentansprüche

1. Bauelementensatz, besonders geeignet als Spielzeug, mit einer Vielzahl von im wesentlichen geometrisch identischen Bauelementen (1), von denen jedes eine Grundebene hat, welche ein Doppelkreuz mit einem langgestreckten rechteckigen Stamm (2) ist, auf dessen jeder Seite zwei Seitenäste (3) angebracht sind, dadurch gekennzeichnet,, daß die Breite des Stamms (2) ein Fünftel der Länge des langgestreckten rechteckigen Stamms (2) ist, daß die Seitenäste (3) quadratförmig mit einer Seitenlänge gleich der Breite des Stamms (2) sind, und daß die Seitenäste (3) an dem Stamm (2) mit einem Abstand (7) im wesentlichen gleich der Breite des Stamms (2) und mit einer Entfernung von den Enden des Stamms (2) gleich der Breite des Stamms (2) angeordnet sind.

2. Bauelementensatz nach Anspruch 1, dadurch gekennzeichnet, daß die Höhe jedes Bauelements (1) gleich der Breite des Stamms (2) des Bauelements (1) ist.

3. Bauelementensatz nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß jedes Bauelement (1) aus einem nachgiebigen Material, z.B einem thermoplastischen Material wie Polyäthylen, hergestellt ist, zweckmäßig hohl z.B. durch Blasformen oder durch Zusammenschluß von zwei identischen Teilen (9, 10), und daß der Abstand (7) zwischen zwei Seitenästen (3) geringfügig enger als die Breite des Stamms (2) ist.

4. Bauelementensatz nach Anspruch 1, 2 oder 3, dadurch gekennzeichnet, daß die Seitenäste (3) wie auch die Endstücke (4) und der Mittelteil (5) des Stamms (2) jedes Bauelements (1) sich leicht nach außen bauchen und an deren Seitenwänden konvex sind.

5. Bauelementensatz nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die miteinander zu verbindenden Wände Vorsprünge oder Muster aufweisen, z.B. Rippen parallel mit einer oder beiden der Seiten der Wänge.

6. Bauelementensatz nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Außenwandung jedes Bauelements (1) wasserundurchlässig ist.

7. Bauelementsatz nach Anspruch 1, 2, 4, 5 oder 6, dadurch gekennzeichnet, daß jedes Bauelement (1) aus einem weniger nachgiebigen oder harten Material wie Kachel, Ziegel oder Beton hergestellt ist, und daß der Abstand (7) zwischen zwei Seitenästen (3) vorzugsweise etwas weiter als die Breite (3) des Stamms (2) ist.

8. Bauelementensatz nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Bauelement (1) Mittel, z.B. flache Stücke aus Karton, Kunststoffschaum, Kunststoffilm, Kleber und/oder Zement einschließt, um eine geeignete Kohäsion zwischen den Bauelementen (1) zu erreichen, wobei diese Mittel in den schmalen Schlitzen zwischen den Wänden des Bauelements (1) angeordnet sind.

9. Bauelementsatz nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der ergänzende Bauelemente (11, 12) umfaßt.

Revendications

1. Assemblage, particulièrement approprié

comme jouet, comprenant un grand nombre d'elements d'assemblage (1) d'une géométrie essentiellement identique, chacune desdites elements étant pourvue d'une surface de base sous form d'une croix double ayant un corps allongé rectangulaire (2) et deux branches latérales (3), attachées des deux côtés dudit corps, caractérisé en ce que le largeur dudit corps (2) correspond à un cinquième de la longueur dudit corps allongé rectangulaire (2), en ce que lesdites branches latérales (3) sont d'une forme carrée dont la longueur d'une arête latérale est egale à la largeur dudit corps (2), et en ce que lesdites branches latèrales (3) sont positionnées sur le corps (2) à un espacement (7) essentiellement égal à la largeur dudit corps (2) et à un écart, des extrémités dudit corps, égal à la largeur dudit corps (2).

2. Assemblage selon la revendication 1, caractérisé en ce que l'hauteur de chaque element d'assemblage (1) est égal à la largeur dudit corps (2) de l'element d'assemblage (1).

3. Assemblage selon la revendication 1 ou 2, caractérisé en ce que chaque element d'assemblage (1) est fabriquée d'une matière élastique, par exemple une matière thermoplastique telle que le polyéthylène, formée en creux d'une facon appropriée, par exemple par voie de soufflage sur matrice ou par fusion de deux piéces identiques (9, 10), et en ce que l'espacement (7) entre deux branches latérales (3) est légèrement plus étroit que la largeur dudit corps (2).

4. Assemblage selon les revendications 1, 2 ou 3, caractérisé en ce que lesdites branches latérales (3), d'un part, e les parties d'extrémité (4) e la partie centrale (5) dudit corps (2), d'autre part, de chaque element d'assemblage (1) légèrement bombent à l'extérieur, ètant convexes sur les parois latérales dudit element.

5. Assemblage selon chacune des revendications précédentes, caractérisé en ce que les parois pourvues pour la raccord, sont munies des saillies ou dessins tels que des arêtes parallèles à un ou les deux des bords desdites parois.

6. Assemblage selon chacune des revendications précédentes, caractérisé en ce que la paroi du dehors de chaque element d'assemblage (1) est étanche à l'eau.

7. Assemblage selon les revendication 1, 2, 4, 5 ou 6, caractérisé en ce que chaque element d'assemblage (1) est fabriquée d'une matière moins plastique ou dure telle que le tuile, le brique ou le béton, et en ce que l'espacement (7) entre les branches latérales (3) est préférablement un peu plus large que la largeur (3) dudit corps (2).

8. Assemblage selon chacune des revendications précédentes, caractérisé en ce que l'element d'assemblage (1) comprend des moyens afin qu'une cohésion convenable soit obtenue entre les elements (1), lesdits moyens étant, par exemple, des pièces aplaties de carton, d'un produit alvéolaire, un film de plastique, un colle et/ou du ciment, et en ce que lesdits moyens sont placés dans des fentes étroites entre las parois desdites elements d'assemblage (1).

9. Assemblage selon chacune des revendications précédentes, caractérisé en ce qu'il comprend des elements d'assemblage (11, 12) supplémentaires.

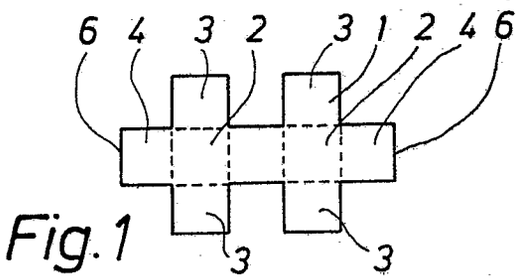

Fig.1

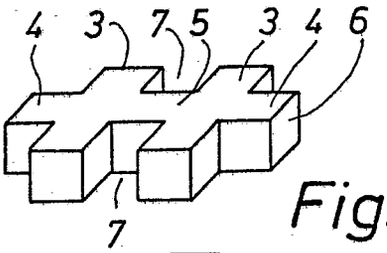

Fig.2

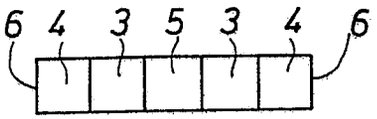

Fig.3

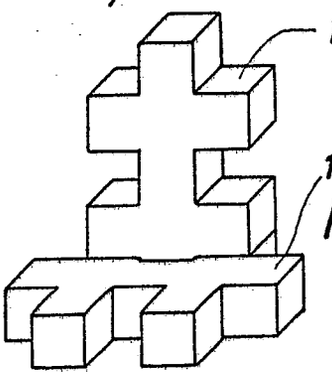

Fig.5

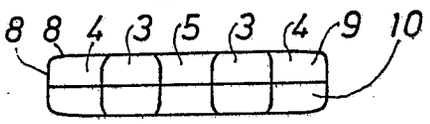

Fig.4

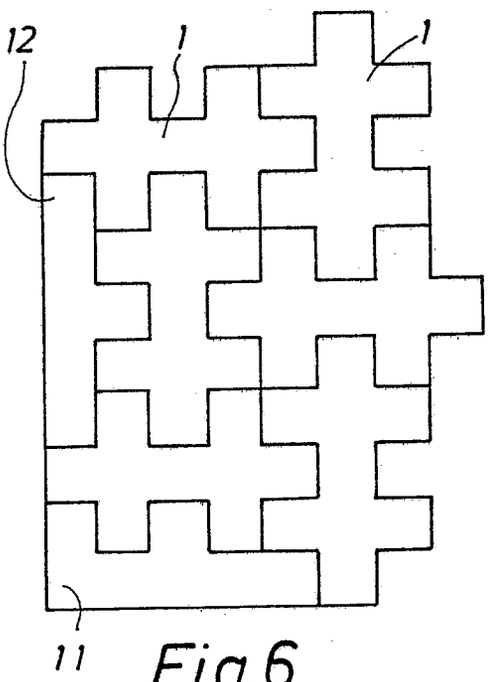

Fig.6

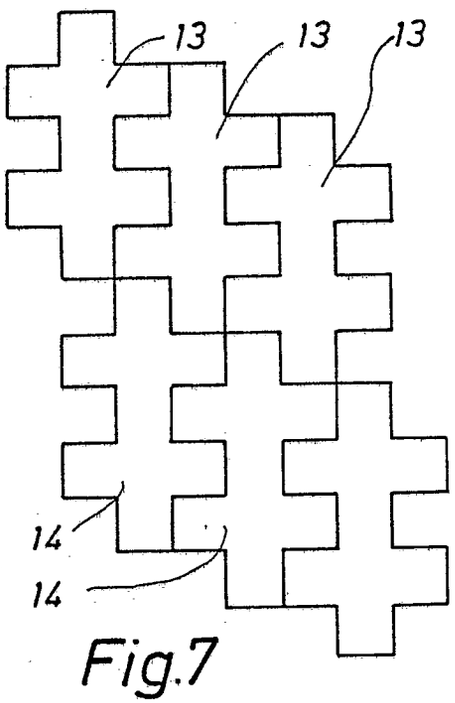

Fig.7