ABSTRACT

Toy brick or block elements in particular of artistic and educational type, in which a plurality of brick elements made of a variety of different colors and a variety of different shapes are interlocked between each other by means of tongues and corresponding grooves to build a great variety of precise and coherent patterns or designs.
INTERLOCKING TOY BRICKS

[0001] The present invention relates to improvements in toy bricks or blocks in particular of artistic and educational type, in which a plurality of brick elements are releasably interlocked between each other by means of tongues and grooves to produce a great variety of precise and coherent patterns or designs of fine details.

[0002] An example of such known building or interlocking blocks are those in European patent specification n 0766585 in which the building elements can be clicked and assembled with identical elements to form patterns. According to the description made, it is impossible in practice as described on the abovementioned patent to get such bricks to click a forth brick with three already assembled to form a square. The only way to get a forth brick with three already assembled to form a square is only by sliding the forth element from above.

[0003] While such building toys can build a variety of patterns, its versatility or ability to build up with other shaped bricks is somewhat limited.

[0004] However, it is an object of the present invention to provide with interlocking bricks which are even more versatile.

[0005] Accordingly, this invention provides a plurality of interlocking brick elements provided in a variety of different shapes and different colors to be interlocked between each other to form precise and coherent patterns of extreme details. Each brick element include an upper part, a lower part and an annular recess which is positioned between the upper and the lower parts and which surrounds the middle part of the longitudinal height of the brick element. The upper part of the brick is formed of a regular circle, regular polygonal or partly spherical shape; the lower part of the brick element is formed of circular or polygonal shapes and has on its longitudinal height at least one longitudinal tongue and at least one longitudinal groove, and these tongues and grooves are shaped and configured so that they can frictionally slide between each other and to be releasably interlocked. The clearance provided by the annular recess within the brick elements enables the tongues of the bricks to engage through and slide into corresponding grooves of other already assembled bricks to form a variety of coherent patterns with tongues and grooves hidden by the upper part of the brick elements.

[0006] Furthermore, at least some of the brick elements having polygonal shapes are provided with one or more concave and/or one or more convex complementary sides.

[0007] Preferably the toy bricks are made of rigid or semi rigid suitable plastic materials in a variety of different sizes and different colors.

[0008] The advantages offered by this invention are mainly:

[0009] a) All interlocking bricks require no other means to be assembled such as glue, magnets or base plates.

[0010] b) The toy bricks are provided in different sizes so that they can suit all different ages.

[0011] c) The toy bricks have high educational and entertainment value and can be used to create pixel artistic frames where the size and design of the pixel elements is only limited by the desire and imagination of the users and where the patterns created can stand on a surface or hang on a wall as decorative and artistic work of art.

[0012] Other advantageous, objects and novel features of the present invention will become more apparent with the following description and the added drawings in which:

[0013] FIG. 1 is a front perspective view at an enlarged scale of a brick element according to the present invention.

[0014] FIG. 2 is a front perspective view at an enlarged scale of another alternative brick element of FIG. 1 according to the present invention.

[0015] FIG. 3 is a bottom perspective view of the brick element of FIG. 1.

[0016] FIG. 4 is a front view of two brick elements of FIG. 1 assembling between each other.

[0017] FIG. 5 is a top perspective view of another brick element of the present invention.

[0018] FIG. 5.A is a top perspective view of another brick element of the present invention.

[0019] FIG. 6 is a top perspective view of another brick element of the present invention.

[0020] FIG. 6.A is a top perspective view of another brick element of the present invention.

[0021] FIG. 7 is a top perspective view of another alternative of brick element of FIG. 1.

[0022] FIG. 8 is a top perspective view of a peg according to the present invention.

[0023] FIG. 9 is a top perspective view of a base element used to assemble and accommodate with the peg element of FIG. 8 according to the present invention.

[0024] FIG. 10 is a top perspective view of another alternative of the base element of FIG. 9.

[0025] FIG. 11 is a top perspective view of another brick element of the present invention.

[0026] FIG. 12 is a bottom perspective view of another brick element according to the present invention.

[0027] FIG. 12.A is a pattern created with the brick elements of FIG. 12.

[0028] FIG. 13 is a top view of a small pattern created by assembling peg elements of FIG. 8 with base elements of FIG. 9.

[0029] FIG. 14 is a top view of a small pattern created by assembling peg elements of FIG. 8 with base elements of FIG. 10.

[0030] FIG. 15 shows three brick elements of FIG. 1 interlocked between each other.

[0031] FIG. 16 shows a combination of few bricks of different shapes assembled and interlocked between each other.

[0032] FIG. 17.A-17.C illustrate some different tongues and corresponding groove pairs that can be used by the brick elements of the present invention.

[0033] FIG. 18 shows an artistic pixel frame, at a very reduced scale, created by using the brick elements of the present invention.

[0034] Referring to the drawings, FIG. 1 shows a perspective top view at an enlarged scale of the interlocking brick element 10 according to the present invention in which the brick 10 is formed with an upper part 11, lower part 12 and an annular recess 13 which is positioned between the upper part 11 and lower part 12 and which surrounds the middle part of the longitudinal height of the brick element 10.

[0035] The diameters of the upper part 11 and lower part 12 are equal in size. The top of the upper part 11 shows a regular circular shape. The lower part 12 has on its periphery two adjacent tongues 14 and two corresponding adjacent grooves 15. The tongues 14 and the grooves 15 extend along the longitudinal height of lower part 12, and these tongues 14 and grooves 15 are shaped and configured so that they can frictionally slide from above into each other as shown in FIG. 4 and be releasably interlocked. The tongues 14 as well as the
grooves 15 can be positioned to be adjacent or to be opposite to each other and can be positioned to be in different angular positions between each other. The recess 13 has a height H slightly bigger than the height D of the tongues 14 and has a depth J slightly bigger than the width K of the tongues 14, as shown in FIG. 4, to allow enough space for the tongues 14 to engage in the recess 13 and frictionally slide into the corresponding groove 15. With the brick elements of the present invention, the tongues and grooves are always hidden by the upper part 11 of the brick elements and the final created pattern is always precise, coherent and well detailed.

[0036] The big advantage of having the annular recess 13 formed in the brick elements is to allow not only to slide, a forth brick with three already assembled to form a square as shown in FIG. 15 but it allows as well to add a brick element to fill a gap 64 between two other brick elements as shown in the pattern of FIG. 16.

[0037] FIG. 2 shows a perspective top view at an enlarged scale of another brick element 20 according to the present invention in which the upper part 21 can be formed with a polygonal shape which can be hexagonal, triangular or square. In the case of the brick element 20 of FIG. 2, the upper part 21 shows a regular square and the lower part 12 is similar to the lower part 12 of the brick element 10 of FIG. 1. The width W of the of the side of the square is equal to the diameter Z of the lower part 12 to allow a construction of coherent patterns without openings between the brick elements.

[0038] The shapes of the upper parts and lower parts of the bricks can be both circular or both polygonal or can be a combination of both polygonal and circular shapes. The top of the brick elements may be formed as well of partly spherical shape.

[0039] FIG. 3 shows a perspective bottom view of the brick element of FIG. 1 in which we can see that the bottom of the brick is shown. The bottom of the bricks may also be provided close as very small brick elements are also designed for the present invention to create pixel art frames.

[0040] FIG. 4 shows a front view of two brick elements to be interlocked between each other. In FIG. 4 we can see the tongue 14 of one brick element engaged in the recess 13 and slide in the corresponding groove 15 of another brick element.

[0041] FIG. 5 and FIG. 5.A show a perspective top view at an enlarged scale of the brick elements 30 and 40 with triangular shapes obtained as by splitting the brick element 20 of FIG. 2 vertically through its longitudinal line. The only difference between the brick 30 and brick 40 is that the lower part 32 of brick 30 is formed with two adjacent tongues 14 whereas the lower part 33 of brick 40 may be formed with one or two grooves 15.

[0042] FIG. 6 and FIG. 6.A show a top perspective view, at an enlarged scale, of other brick elements 50 ad 60 with semi circular shapes obtained as by splitting the brick element 10 of FIG. 1 vertically through its diagonal line. The lower part 52 of the brick 50 is formed with only one tongue 14 positioned in the middle of the straight side of the lower part 52. The lower part 62 of the brick 60 is formed with only one groove 15 positioned in the middle of the straight side of the lower part 62.

[0043] FIG. 7 shows a top perspective view, at an enlarged scale, of another alternative of the brick element 10 of FIG. 1 in which a cylindrical portion 71 protruding up from the center of the top side of the upper part 11 of the brick element 70 and a corresponding cylindrical recess 16 protruding in the center of the bottom side of the lower part 12 of the brick 70. The brick elements 70 can be assembled between each other through the tongues 14 and corresponding grooves 15 as well as through the corresponding cylindrical protruding portions 16 and 71 to provide with a two or three dimensional patterns or designs.

[0044] FIG. 8 shows a top perspective view, at an enlarged scale, of a peg element 80 according to the present invention in which the peg 80 is formed with an upper part 11 similar to the one of brick element 10 of FIG. 1. The lower part of the peg is formed with a stem 81 which has a recessed bottom 82 which is made to frictionally fit in the recess 91 of the base elements 90 and 100 of respectively FIGS. 9 and 10 to provide with brick elements similar to the brick 10 of FIG. 1.

[0045] FIG. 9 shows a perspective top view, at an enlarged scale, of a base support element 90 which could be made of circular or polygonal shape. The base support 90 is provided with at least one tongue 14 and one corresponding groove 15 that extend along the longitudinal height of base element 90. The centre of the base element 90 is formed with a recess 91 protruding through which is used to frictionally receive and retain the peg 80 to create a brick element similar to the one of FIG. 1.

[0046] In FIG. 9, the tongues 14 as well as the grooves 15 of the base element are spaced apart by 90 deg angles which allow the creation of patterns having rows similar to the ones shown in FIG. 13 where the rows are mounted one above the other without displacement between the rows.

[0047] FIG. 10 shows another base support element 100 similar to the one of FIG. 9 in which the tongues 14 as well as the grooves 15 are spaced by 135 degrees angle which allows the creation of patterns having displaced rows similar to the ones shown in FIG. 14.

[0048] FIG. 11 shows a top front perspective view of another brick element 200, with a larger size than the brick element 20 of FIG. 2. Here the brick element 200 is shown with a shape of a planar square tile, which is designed for younger children of an early age. The brick element 200 can be provided in different shapes to include a circle, an oval shape, a leaf having two concave arcs, a crescent and a polygon.

[0049] At least some of the polygonal brick elements of the present invention are provided with one or more concave and/or one or more convex sides, as shown in FIG. 12 and in the tiles 88 and 89 of FIG. 16, and where the concave and convex sides are complementary to each other.

[0050] FIG. 12 shows a perspective bottom view of another brick element 300 having planar triangular shape which has two concave sides and one convex side. The brick 300 shows the annular recess 13, tongue 14 and corresponding groove 15 similar to the ones of brick element of FIG. 1 for the same purpose.

[0051] FIG. 12. A shows a top view, at a reduced scale, of a small pattern created by assembling a plurality of bricks 300 of FIG. 12.

[0052] The top surface of the brick elements of the present invention can be provided with representations of letters, digits or symbols for educational and teaching purposes or to be used as puzzles.

[0053] The brick elements of the present invention are also formed of very small size so that pixel art frames of different designs and different sizes can be created such as the pixel frame shown in FIG. 18, at a very reduced scale.
FIG. 17A-17C show some different shapes of tongue 14 and groove 15 pairs that may be used in the brick elements of the present invention. Other shapes of tongues and grooves can also be used in these brick elements.

It will be appreciated by a skilled person of art that the present invention is not limited to what has been specifically shown and described hereinafter and that various changes and modifications can be made therein without departing from the scope of the present invention.

1-16. (canceled)

17. A building toy formed of interlocking brick elements comprising:
a plurality of interlocking bricks configured to be assembled together to form patterns, each one of the bricks having an upper part, a lower part and an annular recess which extends between the upper part and the lower part and surrounds the middle part of the longitudinal height of the brick;
the upper part of the plurality of bricks being formed with a shape; and
the lower part of the plurality of bricks providing, on its longitudinal height, at least one longitudinally extending tongue and at least one longitudinally extending groove, the at least one tongue and the at least one groove being shaped and configured so that bricks can be releasably interlocked by a tongue of a first brick slidably engaging a groove of a second brick.

18. The building toy according to claim 17, wherein the annular recess of a brick is deeper and longer than the at least one tongue such that the tongue of the first brick can enter the recess of the second brick before slidably engaging with the groove of the second brick.

19. The building toy according to claim 17 wherein the lower part comprises a circular shape.

20. The building toy according to claim 17 wherein the lower part comprises a polygonal shape.

21. The building toy according to claim 17 wherein the upper part comprises a circular shape.

22. The building toy according to claim 17 wherein the upper part comprises a polygonal shape.

23. The building toy according to claim 17 wherein the upper part comprises a partly spherical shape.

24. The building toy according to claim 20 wherein the polygonal shape comprises a square shape.

25. The building toy according to claim 22 wherein the polygonal shape comprises a square shape.

26. The building toy according to claim 20 wherein the polygonal shape comprises a hexagonal shape.

27. The building toy according to claim 22 wherein the polygonal shape comprises a hexagonal shape.

28. The building toy according to claim 20 wherein the polygonal shape comprises a rectangular shape.

29. The building toy according to claim 22 wherein the polygonal shape comprises a rectangular shape.

30. The building toy according to claim 20 wherein the polygonal shape comprises a triangular shape.

31. The building toy according to claim 22 wherein the polygonal shape comprises a triangular shape.

32. The building toy according to claim 20 wherein the polygonal shape comprises at least one of a concave and convex side surface.

33. The building toy according to claim 22 wherein the polygonal shape comprises at least one of a concave and convex side surface.

34. The building toy according to claim 17 wherein at least one of the plurality of bricks comprises a cylindrical portion protruding from the top of the upper part.

35. The building toy according to claim 34 wherein at least one of the plurality of bricks comprises a cylindrical recess in the bottom side of the lower part.

36. The building toy according to claim 17 wherein the top of the upper portion of at least one of the plurality of bricks comprises an alphanumeric representation provided for educational purposes.

37. The building toy according to claim 17 wherein the top of the upper portion of at least one of the plurality of bricks comprises a design provided for educational purposes.

38. The building toy according to claim 17 wherein the tongues and the grooves are hidden by the upper parts when brick elements are assembled between each other.

39. The building toy according to claim 17 wherein at least one of the plurality of bricks comprises a first section and a second section wherein the first section is adapted to releasably connect and fit into the second section.

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