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(54) **PIECES AND METHOD OF PRODUCING MULTIPLE FORMS OF A THREE-DIMENSIONAL CONSTRUCTION GAME**

(57) The invention relates to pieces and a method for producing multiple forms of a three-dimensional construction game by assembling tetragonal prism-shaped pieces having cubic elements projecting from the rectangular faces thereof. The aforementioned cubic projections are arranged in relation to one another such that a space equal to the volume of said projection is disposed therebetween. The pieces are divided into five different groups according to the volume of the tetragonal prism which is, depending on the group, equal to a stack of five, four, three, two or one cubic projection(s).

Said pieces are further differentiated according to the number of rectangular faces comprising cubic projections and the arrangement of same, such that the cubic projections on different faces of the tetragonal prism are disposed at the same height. The inventive production method consists in using the pieces in set groups comprising repeated pieces and assembling said pieces to one another so as to produce multiple forms which, following the mechanisation of the pieces thereof, are assembled to produce a wide variety of geometric, irregular..... shapes.

1-144

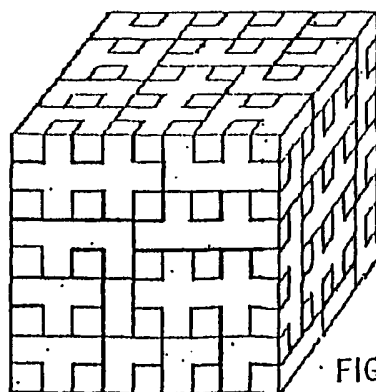


FIG 28

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Description

STATE OF THE ART

[0001] The game belongs in the category of making pieces for three-dimensional construction games: construction games jigsaws and 3-D puzzles are included within this category.

DESCRIPTION OF THE PRIOR ART

[0002] The prior art before of the application date, known, by the applicant, include jigsaw pieces which are constructed by means of assembling the three-dimensional pieces, which in turn lead to geometric shapes: cubes, stars, pyramids, spheres... and the pieces of so called "3D-puzzles", which consist of pieces with a form similar to those of flat puzzles, although heavier and which, when assembled, reproduce the surface of a three-dimensional figure.

[0003] There are also the pieces belong to so called "construction games", which have prismatic edges with projections that fit together and can lead to reproductions of three-dimensional figures, with a certain approximation of their outline, using a great number of pieces. At the moment, there are no pieces, and there is no technique capable of reproducing, by means of assembling three-dimensional pieces, a great variety of three-dimensional shapes (not just geometric) with interior pieces as well as exterior ones and with total precision in their outline.

EXPLANATION OF THE INVENTION

[0004] The object of the invention refer to the 27 pieces, which are all tetragonal prisms, with cubic projections on the rectangular faces of the prism and which, assembled in groups of pieces with certain repetitions of pieces and fitted together give rise to multiple shapes, like cubes, tetragonal prisms, staggered pyramids; and to a manufacturing process which consists of mechanizing the pieces which make up these shapes to obtain irregular pieces around the periphery so that they reproduce a great variety of solid three-dimensional shapes, which have totally precise outlines yet, whilst they may be geometric, also irregular...

DESCRIPTION OF THE PIECES

[0005] The pieces are formed in the shape of tetragonal prisms with cubic projections in their rectangular faces, made so that they leave behind them a free space that is equal to their volume. The volume of the tetragonal prism can be used as a reference at the moment of differentiating between certain pieces where the tetragonal prism may have a volume equivalent to the superposition of 5 (pieces 1, 2, 3, 4, 5, 6); 4 (pieces 7, 8, 9, 10, 11, 12); 3 (pieces 13, 14, 15, 16, 17, 18, 19, 20,

21, 22, 23); 2 (pieces 24, 25, 26); or a cubic extension (piece 27).

[0006] Within these five groups, the pieces are differentiated by the number of rectangular faces which their cubic projections possess. There can be 4 (pieces 6, 12, 18, 19); 3 (pieces 4, 11, 17, 20); 2 adjacent faces (pieces 3, 9, 15, 21, 26); 2 non-adjacent (pieces 5, 10, 16, 22): 1 (pieces 2, 8, 14, 23, 25); or none (1, 7, 13, 24, 27) and there exists a symmetry between the cubic projections situated in the different rectangular faces in the way that they are all situated at the same height of the tetragonal prism.

[0007] This means that the cubic projections of one piece fit together perfectly with the empty spaces between the cubic projections of another piece, and so when the pieces are put together, they give rise to compact and cohesive shapes.

DESCRIPTION OF THE DRAWS

[0008]

Figure 1: A tetragonal prism (31), that can be applied in the invention being this the 1 piece

Figure 2: A tetragonal prism (32) of equal volume to piece 1, with two cubic projections (33 and 34) situated in one of its rectangular faces, that can be applied in the invention being this the 2 piece

Figure 3: A tetragonal prism (35) of equal volume to pieces 1 and 2 with two pairs of cubic projections situated respectively in two of its adjacent rectangular faces (36, 37, 39 and 39), that can be applied in the invention being this the 3 piece

Figure 4: A tetragonal prism (40) of equal volume to shapes 1, 2 and 3, with three pairs of cubic projections situated respectively in three of its rectangular faces (41, 42, 43, 44, 45, and 46), that can be applied in the invention being this the 4 piece

Figure 5: A tetragonal prism (47) of equal volume to shapes 1, 2, 3 and 4, with two pairs of cubic projections (48, 49, 50 and 51) situated respectively side by side two of its non-adjacent rectangular faces, being this the 5 piece

Figure 6: A tetragonal prism (52) of equal volume to shapes 1, 2, 3, 4 and 5, with four pairs of cubic projections (53, 54, 55, 56: 57, 58, 59 and 60) situated respectively on its four rectangular faces, being this the 6 piece

Figure 7: A tetragonal prism (61) of equal volume to the superposition of four cubic projections, being this the 7 piece

Figure 8: A tetragonal prism (62) of equal volume to shape 7 with two cubic projections (63 and 64) situated on one of its rectangular faces being this the 8 piece

Figure 9: A tetragonal prism (65) of equal volume to shapes 7 and 8, with two pairs of cubic projections (66 and 67; 68 and 69) situated respectively

on two of its adjacent rectangular faces, being this the 9 piece

Figure 10: A tetragonal prism (70) of equal volume to shapes 7, 8 and 9, with two pairs of cubic projections (71 and 72: 73 and 74) situated respectively on two of its non-adjacent rectangular faces, being this the 10 piece

Figure 11: A tetragonal prism (75) of equal volume to shapes 7, 8, 9 and 10, with three pairs of cubic projections (76 and 77, 78 and 79, 80 and 81), situated respectively on three of its rectangular faces, being this the 11 piece

Figure 12: A tetragonal prism (82) of equal volume to shapes 7, 8, 9, 10 and 11, with a pair of cubic projections (83, 84, 85, 86, 87, 88, 89 and 90) on each of its four rectangular faces, being this the 12 piece

Figure 13: A tetragonal prism (91) of equal volume to the superposition of three cubic projections, being this the 13 piece

Figure 14: A tetragonal prism (92) of equal volume to shape 13 with two cubic projections (93 and 94) situated in one of its rectangular faces, being this the 14 piece

Figure 15: A tetragonal prism (95) of equal volume to shapes 13 and 14, with two pairs of cubic projections (96, 97, 98 and 99) situated respectively on two of its adjacent rectangular faces, being this the 15 piece

Figure 16: A tetragonal prism (100) of equal volume to shapes 13, 14 and 15, with two pairs of cubic projections (101, 102, 103 and 104) situated respectively on two of its non-adjacent rectangular faces, being this the 16 piece

Figure 17: A tetragonal prism (112) of equal volume to shapes 13, 14, 15 and 16, with three pairs of cubic projections (106, 107, 108, 109, 110 and 111) situated respectively on three of its rectangular faces, being this the 17 piece

Figure 18: A tetragonal prism (112) of equal volume to shapes 13, 14, 15, 16 and 17, with four pairs of cubic projections (113, 114, 115, 116, 117, 118, 119 and 120) situated respectively on its four rectangular faces, being this the 18 piece

Figure 19: A tetragonal prism (1121) of equal volume to shapes 13, 14, 15, 16, 17 and 18, with four cubic projections (122, 123, 124 and 125) situated respectively on its four rectangular faces, being this the 19 piece

Figure 20: A tetragonal prism (126) of equal volume to shape 19, with three cubic projections (127, 128 and 129) situated respectively on three of its rectangular faces, being this the 20 piece

Figure 21: A tetragonal prism (130) of equal volume to shapes 19 and 20, with two cubic projections (131 and 132) situated respectively on two of its adjacent rectangular faces, being this the 21 piece

Figure 22: A tetragonal prism (133) of equal volume

to shapes 19, 20 and 21, with two cubic projections (134, 135) situated respectively on two of its non-adjacent faces, being this the 22 piece

Figure 23: A tetragonal prism (136) of equal volume to shapes 19, 20, 21 and 22, with a cubic projection (137) situated on one of its rectangular faces, being this the 23 piece

Figure 24: A tetragonal prism (142) of equal volume to the superposition of two cubic projections, being this the 24 piece

Figure 25: A tetragonal prism (142) of equal volume to shape 24 with a cubic projection (143) situated on one of its rectangular faces, being this the 25 piece

Figure 26: A tetragonal prism (139) of equal volume to shapes 24 and 25, with two cubic projections (140 and 141) situated respectively on two of its adjacent rectangular faces, being this the 26 piece

Figure 27: A cube (144) of equal volume to a cubic projection, being this the 27 piece

Figure 28: A cube made from the assembling of various pieces: six 2 pieces, eight 3 pieces, nine 4 pieces, eight 5 pieces, two 6 pieces, seven 8 pieces, fifteen 9 pieces, two 10 pieces, six 11 pieces, two 12 pieces, nine 14 pieces, seven 15 pieces, five 16 pieces, one 17 piece, two 24 pieces, two 25 pieces and one 26 piece

Figure 29: The six faces of the same cube laid out flat

Figure 30: The result of mechanizing the pieces of the same cube, producing the form of a triangular based prism.

[0009] One example of putting the pieces together is a cube (figure 28), the volume of which is equivalent to 9x9x9 cubic projections made by way of assembling a group of pieces advisably repeated : the 2 piece, the 3 piece, the 4 piece, the 5 piece, the 6 piece, the 7 piece, the 8 piece, the 9 piece, the 10 piece, the 11 piece, the 12 piece, the 14 piece, the 15 piece, the 16 piece, the 17 piece, the 23 piece, the 24 piece, the 25 piece and the 26 piece.

Here are some other examples:

[0010] Two 26 pieces can make a cube of 2x2x2.

[0011] A 16 piece, a 17 piece and an 18 piece can make a cube of 3x3x3.

[0012] Two 11 pieces, one 12 piece, one 10 piece and four 8 pieces can make a cube of 4x4x4.

[0013] Nine 2 pieces, one 3 piece, two 5 pieces, one 6 piece and two 4 pieces can make a cube of 5x5x5...

[0014] One 10 piece, one 15 piece, six 2 pieces, two 5 pieces, four 4 pieces, two 3 pieces, two 6 pieces, three 8 pieces, four 14 pieces, one 16 piece, one 22 piece and one 25 piece can make a cube of 6x6x6

[0015] After one of these many shapes has been made, it is possible to put the pieces which make up the

shape under a mechanized process to obtain other shapes from them, cut out peripherally to reproduce an area of the surface of a three-dimensional shape chosen in advance and a concrete volume integrated in the total volume of this same shape, depending on its position in the assembly.

[0016] Once put together, the pieces perfectly reproduce this shape. In this way, it is possible to form many different shapes from this game, which are three-dimensional shapes with interior and exterior pieces, and it is possible to reproduce by assembling, a great variety of three-dimensional shapes which might be geometric, irregular...

[0017] Let us suppose that we have the 9x9x9 cube (fig.28) and that we want to make a prism with a triangular base from its pieces. We can like is showed at figure 29 to mechanize the pieces situated in the vertical plane of the diagonal of the base of the cube. as if we were cutting the cube along the plane which unites the vertical edges which depart of the diagonal of the cube's base.

[0018] Various materials may be used, such as plastic or wood. Painting the exterior faces of the shape with drawings, and painting the interior ones with plain colour one for each direction of the three dimensional espace .

[0019] The invention can to apply in the industry .It can be made in a series: the first 27 pieces can be made by way of moulding or machine tools, and once results have been obtained from the assembling of groups of pieces with repeated pieces . It can mechanize the pieces with machine tools capable to of height precision and complex geometry, (for example, in numerical control), or making moulds of these pieces, and in such case then making in series for each concrete figure in such case it can be used that plastic injection. In the latter case, the pieces taken from the moulds could be hollow, and in the first, they should be solid if they go to be mechanized.

Claims

1. Pieces and method for producing multiple forms of a three-dimensional construction game **characterized** because the pieces are tetragonal prism shaped having cubic projections for the rectangular faces thereof. differentiated according to the volume of the tetragonal prism which is depending on the group, equal to a stack of five(1,2,3,4 and 5), four((8,9,10,11 and 12), three(13,14,15,16,17,18 and 19), two(24,25 and 26) or one (27) cubic projection(s) and differentiated inside these group according to the number of rectangular faces comprising cubic projections which can be four(6,12,18,19), three (4,11,17,20),two adjacents (3,9,15,21), two not adjacents (5,10,16,22,26), one (2,8,14,23,25), or anyone (1,7,13,24,27); such that the cubic projections emerging in one rectangular face of the

prism are disposed such that there is a space equal at the volume of said projections between them and in the way that the cubic projections on different faces of the tetragonal prisms are disposed at the same height of the tetragonal prism: and being that the cubic projections in the rectangular faces where there are, emerge in the first group (1, 2, 3, 4, 5 y 6) in number of two (at the height of the second and fourth cube) ; in the second group (7,8,9,10,11 y 12) emerge in number of two (at the height of the first and third cube), in the third there are pieces where emerge in number of two (14,15,16,17,18) (at the height of the first and third cube) and there are another where emerge in number of one (19,20,21,22,23,) (at the height of the second cube) and in the fourth group (25 Y 26) emerge in number of one (at the height of the first cube)

2. Pieces and method for producing multiple forms of a three dimensional construction game according to before claim which is **characterized in that** the 1 piece is a tetragonal prism -shaped (31) piece which volume is equivalent to the superposition of five cubic projections.

3. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 2 piece is a tetragonal -prism shaped(32) which volume is equivalent to the superposition of five cubic projections with two cubic projections disposed at the same height of the second cube (34) and at the height of the fourth cube(33) (considering that the prism is divisible in five cubes with equal volume)in one of the rectangular faces of the prism

4. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 3 piece is a tetragonal -prism shaped (35) which volume is equivalent to the superposition of five cubic projections, with two pairs of cubic projections disposed at the same height that the second (37 and 39) and the fourth (36 and 38) cube : in two of its adjacents rectangular faces, respectively.

5. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 4 piece is a tetragonal -prism shaped (40) which volume is equivalent to the superposition of five cubic projections with three pairs of cubic projections disposed at the same height of the second (42, 44 and 46) and the fourth cube (41. 43 and 45) in three of its rectangular faces, respectively.

6. Pieces and method for producing multiple forms of a three dimensional construction game according

to before claims which is **characterized in that** the 5 piece is a tetragonal -prism shaped (47) which volume is equivalent to the superposition of five cubic projections with two pairs of cubic projections disposed at the same height of the second cube (49 and 51) and the fourth cube (48 and 50) in two of its not adjacents rectangular faces, respectively.

7. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 6 piece is a tetragonal -prism shaped (52) which volume is equivalent to the superposition of five cubic projections with four pairs of cubics projections at the same height that the second (54,56,58 and 60) and the fourth cube(53,55,57 and 59) its four rectangular faces, respectively.

8. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 7 piece is a tetragonal -prism shaped (61) which volume is equivalent to the superposition of four cubic projections

9. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 8 piece is a tetragonal -prism shaped (62) which volume is equivalent to the superposition of four cubic projections with two cubic projections in one of its rectangular faces at the same height that the first cube (64) and third cube (63).

10. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 9 piece is a tetragonal -prism shaped (65) which volume is equivalent to the superposition of four cubic projections with two pairs of cubic projections disposed in two of its adjacents rectangular faces at the same height of the first (67 and 69) and third cube (66 and 68) respectively.

11. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 10 piece is a tetragonal -prism shaped (70) which volume is equivalent to the superposition of four cubic projections with two pairs of cubic projections disposed at the same height of the first (72 and 74) and the third cube (71 and 73) in two of its not adjacents rectangular faces.

12. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 11 piece is a tetragonal -prism shaped (75) which

volume is equivalent to the superposition of four cubic projections with three pairs of cubic projections disposed at the same height of the first (77,79 and 81) and the third cube (76,78 and 80) in three of its rectangular faces, respectively.

13. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 12 piece is a tetragonal -prism shaped (82) which volume is equivalent to the superposition of four cubic projections with four pairs of cubic projections disposed at the same height of the first (84,86,88 and 90) and the third cube (83,85,87 and 89) in its four rectangular faces.

14. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 13 piece is a tetragonal -prism shaped (91) which volume is equivalent to the superposition of three cubic projections.

15. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 14 piece is a tetragonal -prism shaped (92) which volume is equivalent to the superposition of three cubic projections with two cubic projections disposed at the same height of the first (94) and third cube (93) in one of its rectangular faces.

16. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 15 piece is a tetragonal -prism shaped (95) which volume is equivalent to the superposition of three cubic projections with two pairs of cubic projections disposed at the same height of the first (97 and 99) and the third cube (96 and 98) in two of its adjacents rectangular faces, respectively.

17. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 16 piece is a tetragonal -prism shaped (100) which volume is equivalent to the superposition of three cubic projections with two pairs of cubic projections disposed at the same height of the first (102 and 104) and the third cube (101 and 103) in two of its not adjacents rectangular faces, respectively.

18. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 17 piece is a tetragonal -prism shaped (105) which volume is equivalent to the superposition of three cubic projections with three pairs of cubic projec-

tions disposed at the same height of the first (107, 109 and 111) and the third cube (106, 108 and 110) in three of its rectangular faces, respectively.

19. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 18 piece is a tetragonal -prism shaped (112) which volume is equivalent to the superposition of three cubic projections with four pairs of cubic projections disposed at the same height of the first (114, 116, 118 and 120) and the third cube (113, 115, 117 and 119) in its four rectangular faces, respectively.
20. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 19 piece is a tetragonal -prism shaped (121) which volume is equivalent to the superposition of three cubic projections with four cubic projections disposed at the same height of the second cube (122, 123, 124 and 125) in its four rectangular faces, respectively.
21. Pieces and method for producing of multiple forms a three dimensional construction game according to before claims which is **characterized in that** the 20 piece is a tetragonal -prism shaped (126) which volume is equivalent to the superposition of three cubic projections with three cubic projections disposed at the same height of the second cube (127, 128 and 129) in three of its rectangular faces respectively.
22. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 21 piece is a tetragonal -prism shaped (130) which volume is equivalent to the superposition of three cubic projections with two cubic projections disposed at the same height of the second cube (131 and 132) in two of its adjacent rectangular faces, respectively.
23. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 22 piece is a tetragonal -prism shaped (133) which volume is equivalent to the superposition of three cubic projections with two cubic projections disposed at the same height of the second cube (134 and 135) in two of its not adjacent rectangular faces, respectively.
24. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 23 piece is a tetragonal -prism shaped (136) which volume is equivalent to the superposition of three cubic projections with one cubic projection disposed at the same height of the second cube (137) in one of its rectangular faces.
25. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 24 piece is a tetragonal -prism shaped (138) which volume is equivalent to the superposition of two cubic projections .
26. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 25 piece is a tetragonal -prism shaped (142) which volume is equivalent to the superposition of two cubic projections with one cubic projection (143) disposed at the same height of the first cube in one of its rectangular faces.
27. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 26 piece is a tetragonal -prism shaped (139) which volume is equivalent to the superposition of two cubic projections with two cubic projections (140 and 141) disposed at the same height of the first cube in two of its adjacent rectangular faces respectively.
28. Pieces and method for producing of multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the 27 piece is a tetragonal -prism shaped (144) which volume is equal to one cubic projections.
29. Pieces and method for producing multiple forms of a three dimensional construction game according to before claims which is **characterized in that** the method of producing consist in to select groups of pieces comprising repeated pieces, once made the pieces with machine tools of height precision or with moulds and assembling between them for obtain multiple forms :cube-shaped, staggered pyramid -shaped, star-shaped, tetragonal prism -shaped... and subjecting the constituent pieces of these forms at a method of mechanisation for to obtain a peripherally cut out pieces, deriveds of the initials constituent pieces that assembling between them reproduce the surface of a three dimensional figure predetermined in advance in the way of that the initials pieces have been mechanised for reproducing a concrete area in the surface of the figure and a concrete volume integrated in the total volume : depending of the position that take up the piece in the assembly.

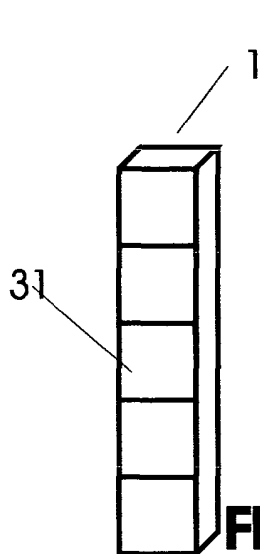


FIG 1

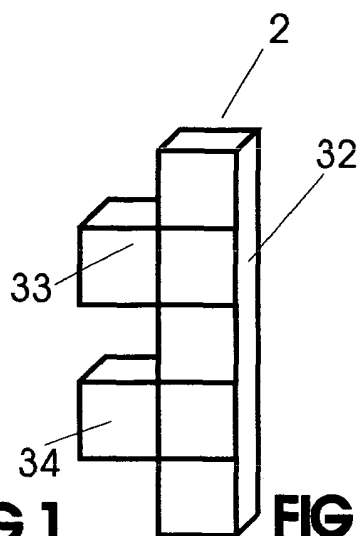


FIG 2

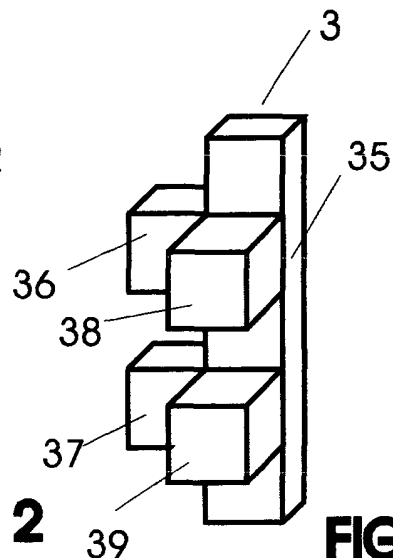


FIG 3

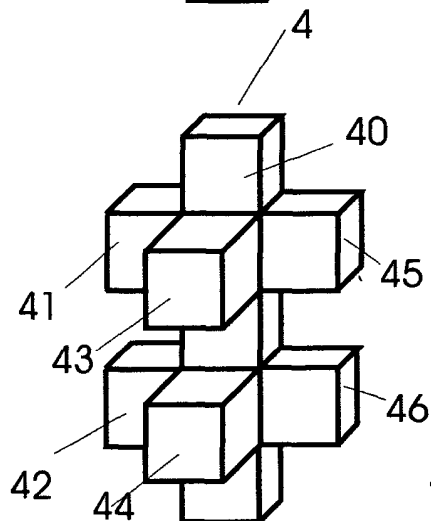


FIG 4

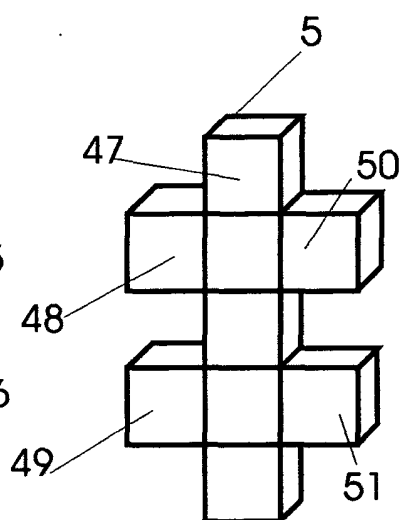


FIG 5

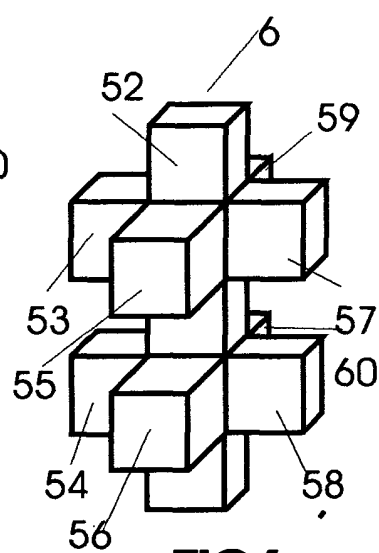


FIG 6

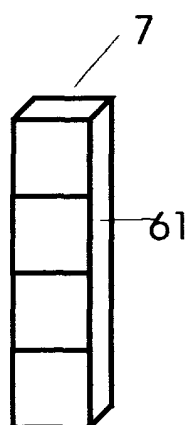


FIG 7

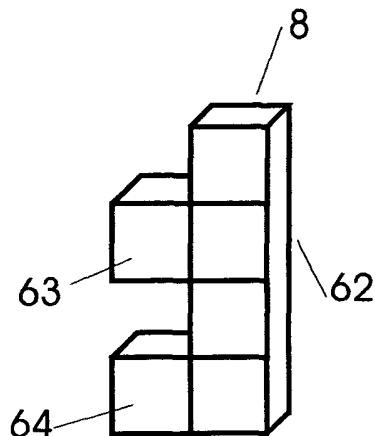


FIG 8

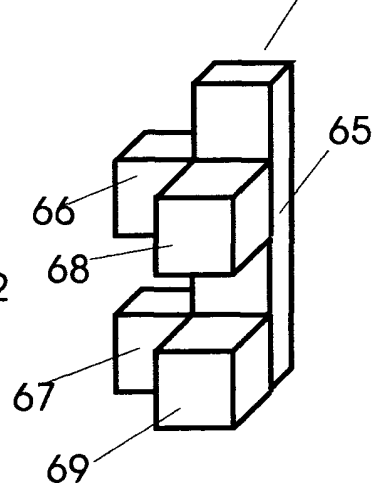


FIG 9

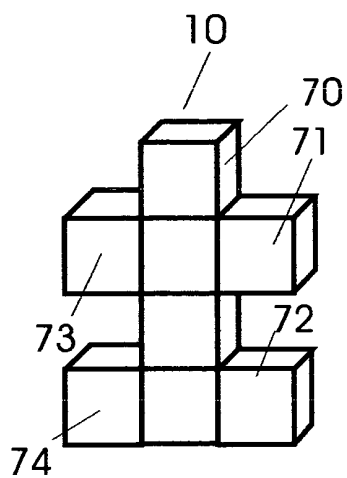


FIG 10

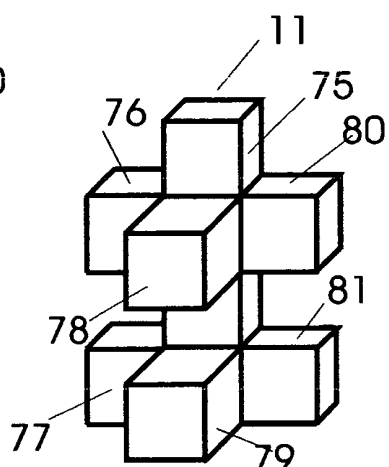


FIG 11

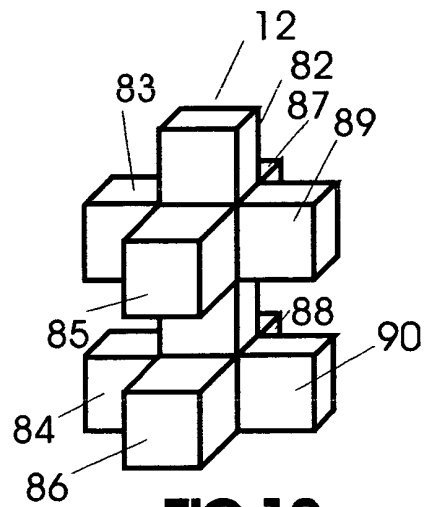


FIG 12

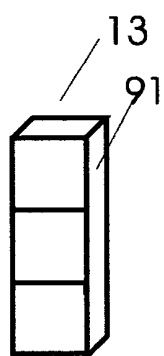


FIG 13

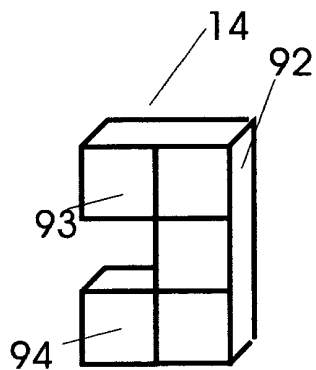


FIG 14

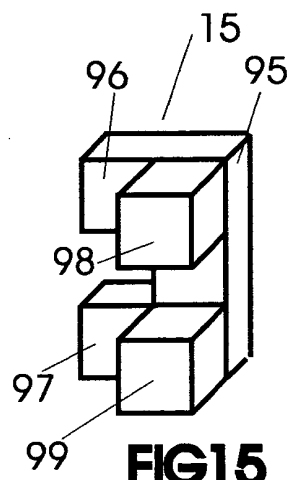


FIG 15

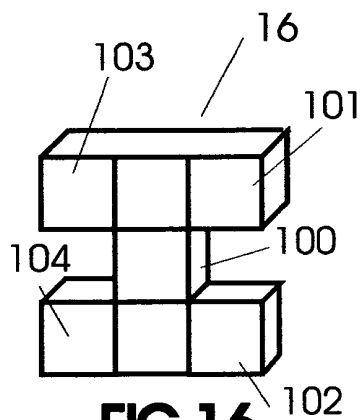


FIG 16

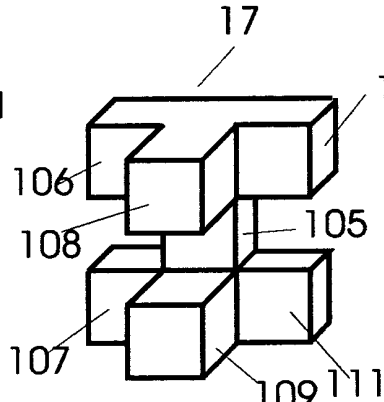


FIG 17

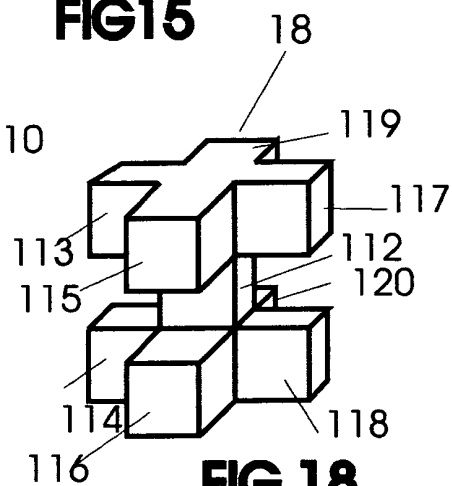
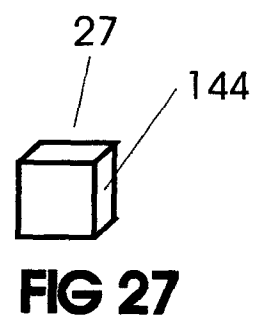
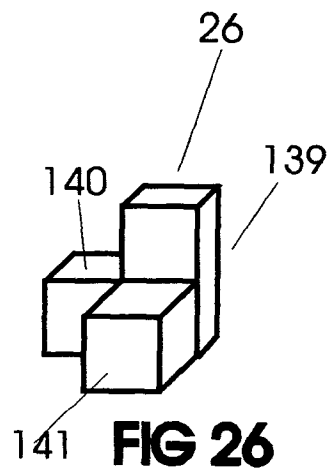
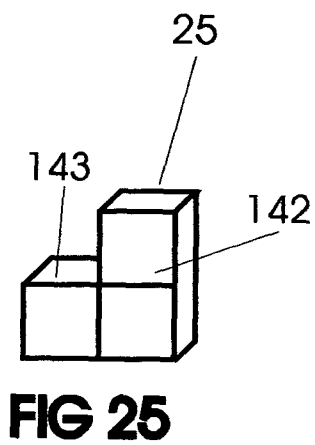
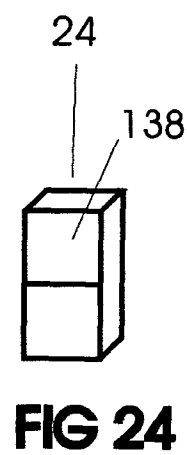
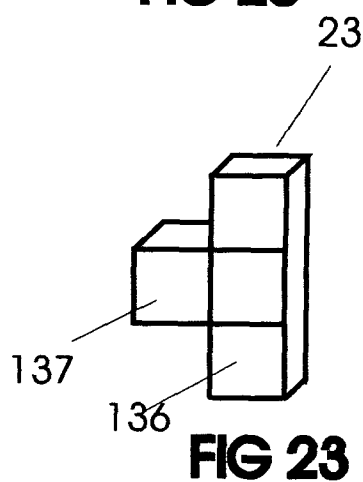
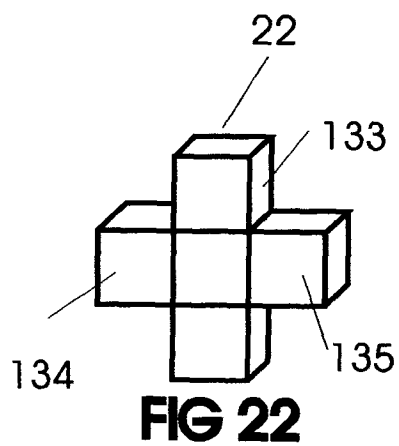
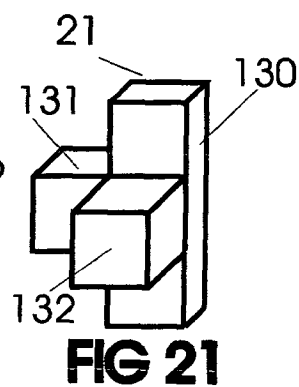
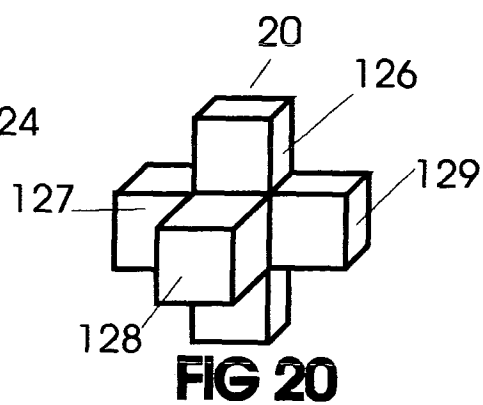
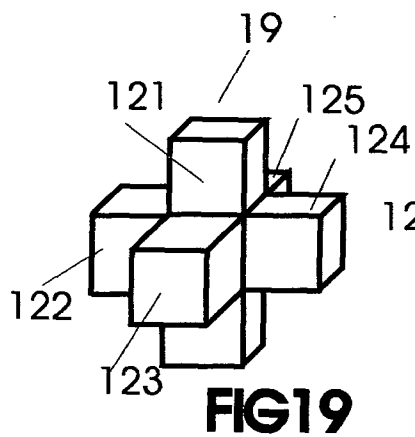


FIG 18



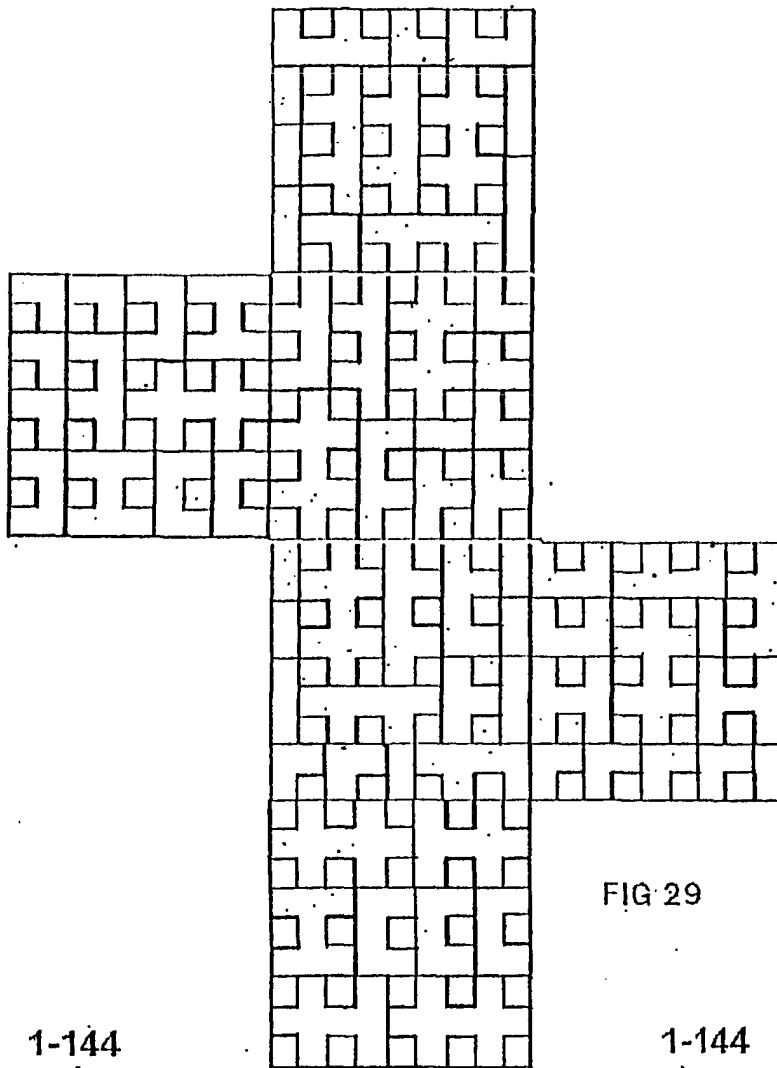


FIG 29

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1-144

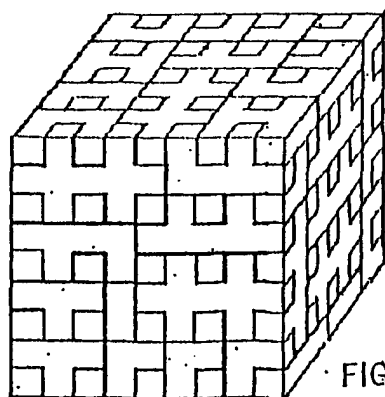


FIG 28

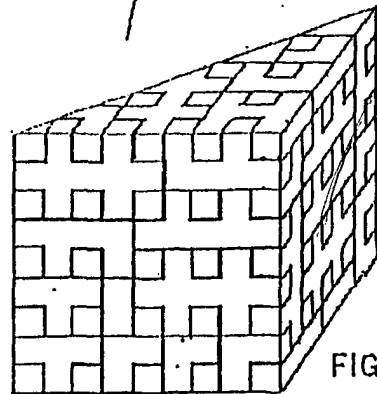


FIG 30

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES03/00251

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A63F 9/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A63F, A63H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, PAJ, ECLA, UCLA, OEPMPAT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ES 277777 U (BASSAS) 16.07.1984, The whole document ---	1-29
A	US 3065970 A (SUTTON) 27.11.1962, column 2, lines 1-30, figures ---	1-29
A	US 5393063 A (ICHIMARU) 28.02.1995, figures 1-6 ---	1-29
A	DE 1961430 A (KÜNZELL) 16.06.1971, figures 1-29 ---	1-29
A	JP2000107436 A (SHUNJU KOSHA KK) 18.04.2000, figures ---	1-29

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

22 AUG 2003 (22.08.03)

Date of mailing of the international search report

15 SEP 2003 (15.09.03)

Name and mailing address of the ISA/

S.P.T.O.

Authorized officer

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES03/00251

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 11128548 A (SHUNJU KOSHA KK) 18.05.1999, figures ---	1-29
A	DE 2741014 A (RÖHLER) 26.04.1979, figures 1-28 ---	1-29
A	ES 294697 U (MOUTON) 16.10.1986, figures ---	1-29

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INTERNATIONAL SEARCH REPORT
 Information on patent family members

 International Application No
 PCT/ ES03/00251

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
ES 277777 U	16.07.1984	NONE	
US 3065970 A	27.11.1962	NONE	
US 5393063 A	28.02.1995	NONE	
DE 1961430 A	16.06.1971	NONE	
JP 2000107436 A	18.04.2000	NONE	
JP 11128548 A	18.05.1999	NONE	
DE 2741014 A	26.04.1979	NONE	
ES 294697 U	16.10.1986		

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