



US 20070108701A1

(19) **United States**

(12) **Patent Application Publication**
Gu et al.

(10) **Pub. No.: US 2007/0108701 A1**

(43) **Pub. Date: May 17, 2007**

(54) **APPARATUS AND METHOD FOR
CONSTRUCTING NUMBER PUZZLES**

(52) **U.S. Cl. 273/153 R**

(76) Inventors: **Keren Gu**, Gaithersburg, MD (US);
Forrest Zitong Zhang, Gaithersburg,
MD (US)

(57) **ABSTRACT**

Correspondence Address:

Keren Gu
Apt. 404
15606 Marathon Cir.
Gaithersburg, MD 20878 (US)

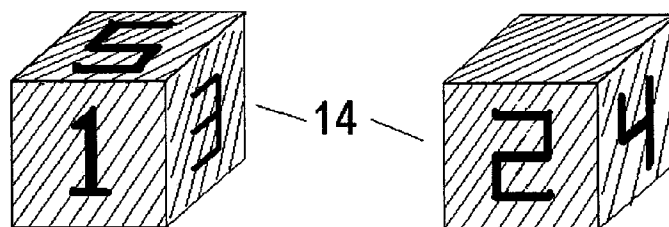
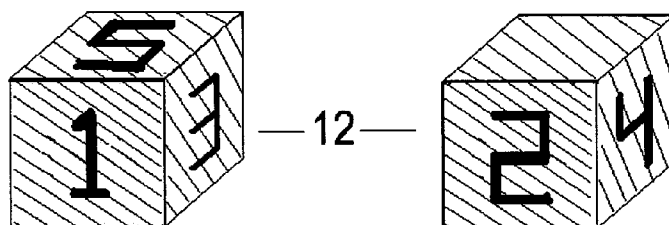
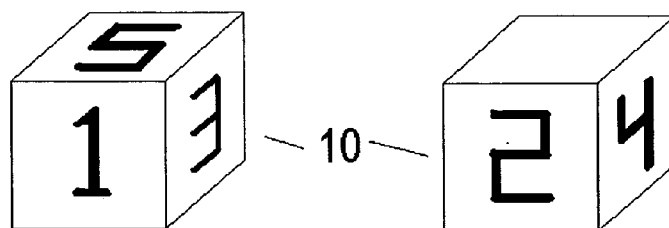
An apparatus and method for constructing the two-dimensional five-number puzzle is provided wherein the twenty-five cubes, each with numbered indicia from "1" to "5", are positionable in a five-times-five relationship grid that forms twenty-five square recesses arranged in five horizontal and five vertical rows intersecting each other, and a plurality of pattern cards can be chosen and positioned as the puzzle's background pattern that divides the five-times-five grid into five sections with three color indicia. The object of the game is to arrange the cubes so that the numerical indicia whereon are unique from "1" to "5" horizontally, vertically, as well as in each section, and the color indicia match those indicia of each section on the pattern card.

(21) Appl. No.: **11/274,646**

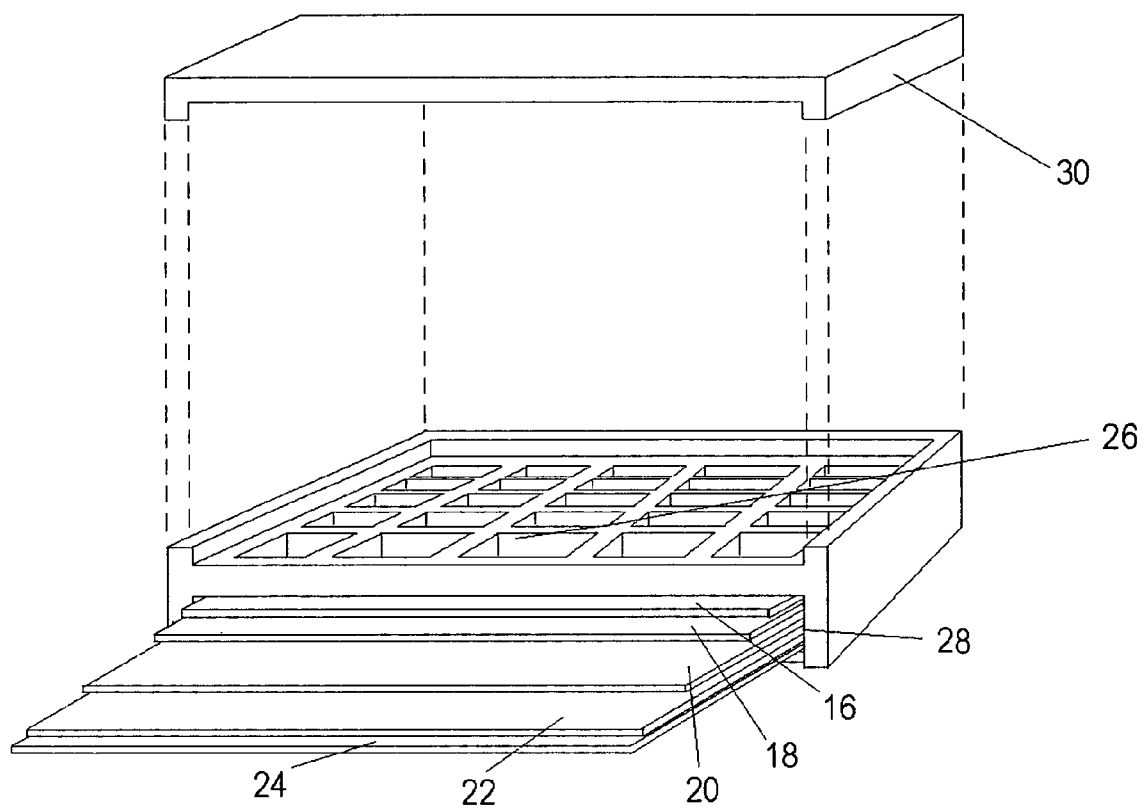
(22) Filed: **Nov. 15, 2005**

Publication Classification

(51) **Int. Cl.**
A63F 9/00 (2006.01)



Three Types of Playing Cubes



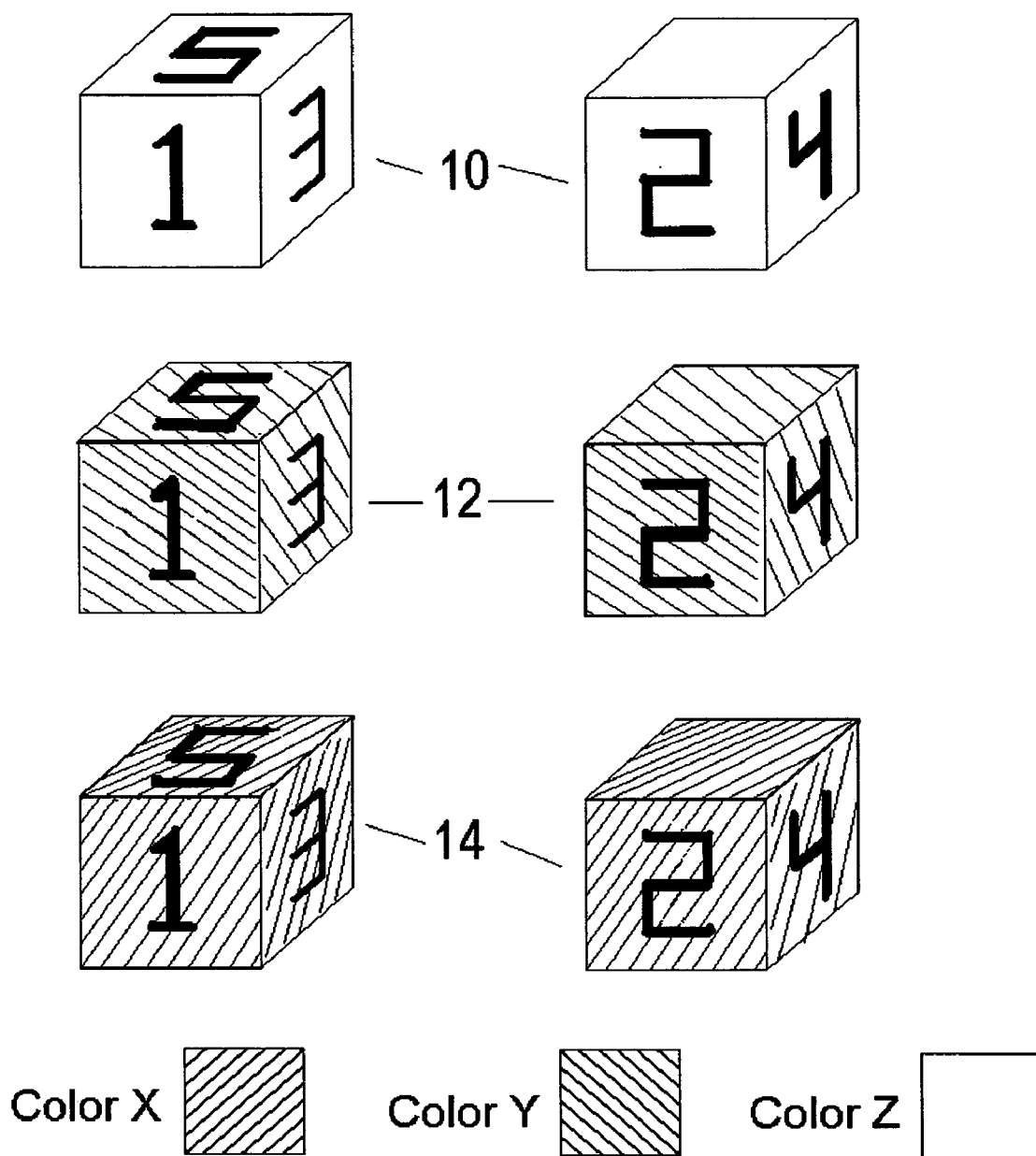


FIG. 2 Three Types of Playing Cubes

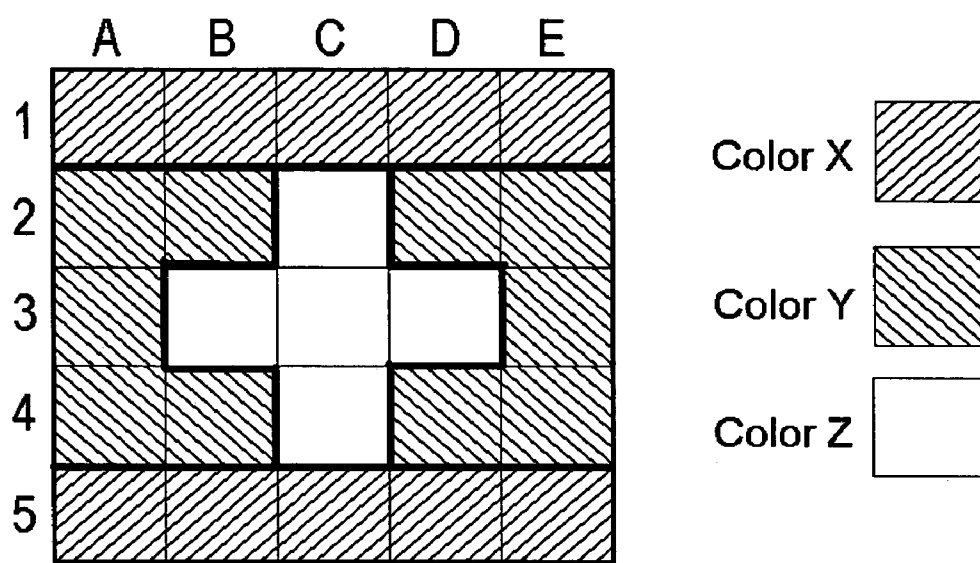


FIG. 3 A diagram of the front side of the first pattern card.

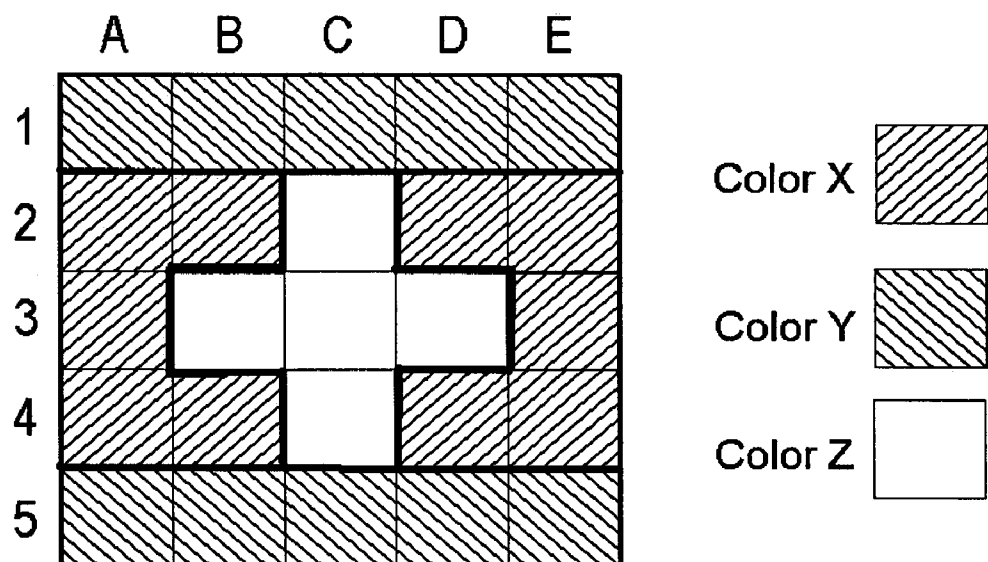


FIG. 4 A diagram of the back side of the first pattern card.

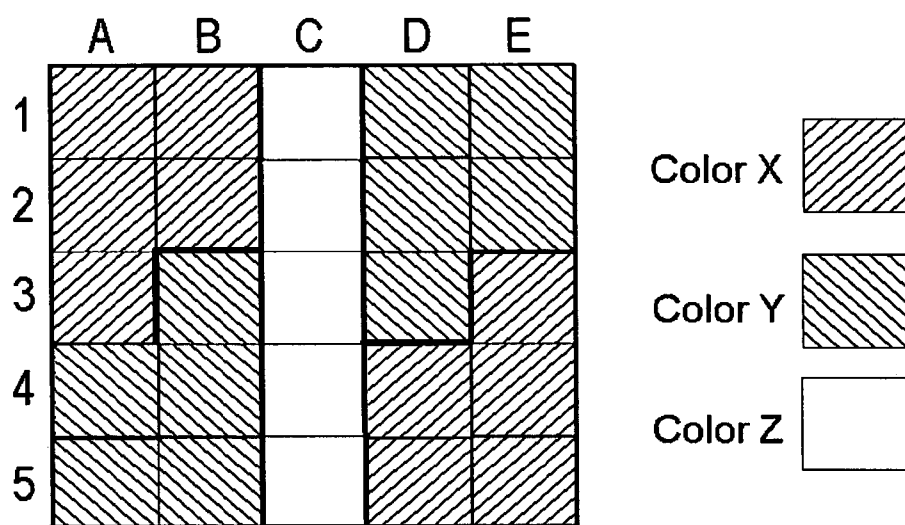


FIG. 5 A diagram of the front side of the second pattern card.

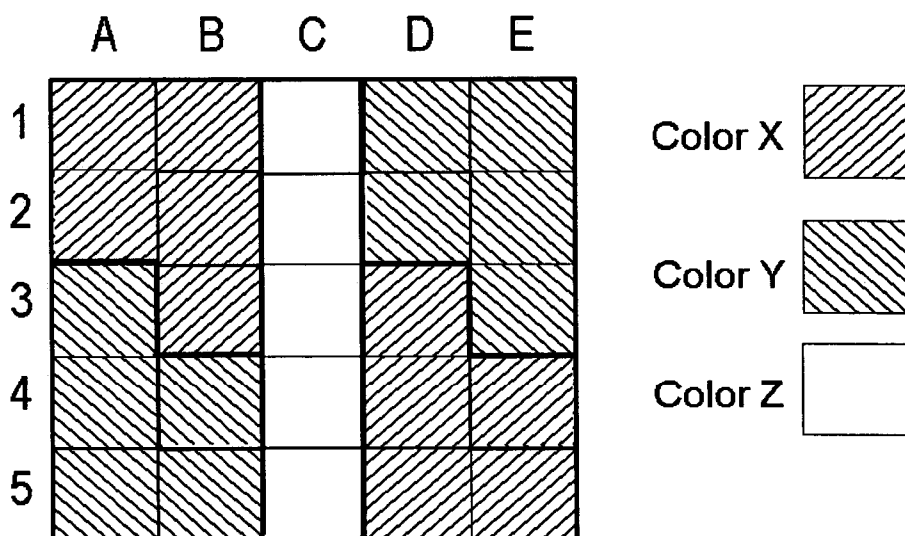


FIG. 6 A diagram of the back side of the second pattern card.

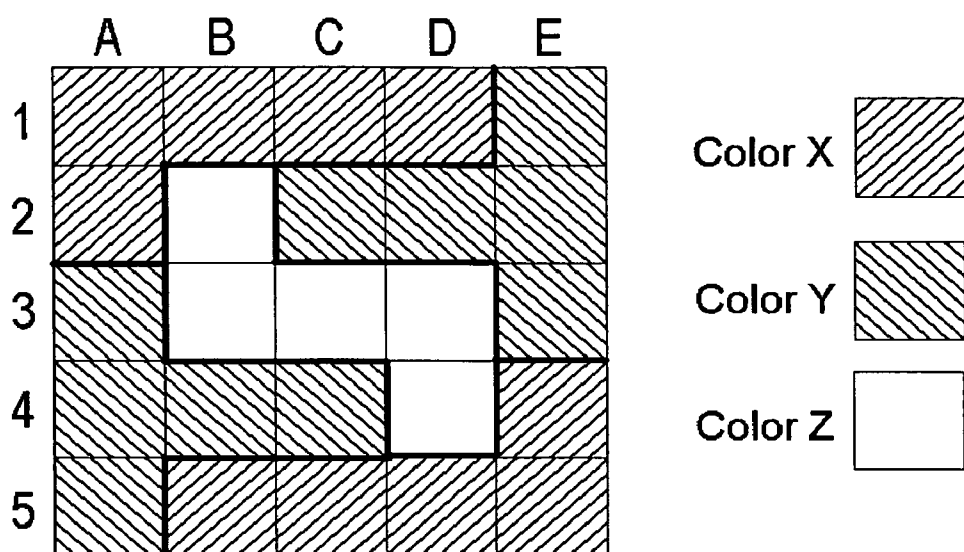


FIG.7 A diagram of the front side of the third pattern card.

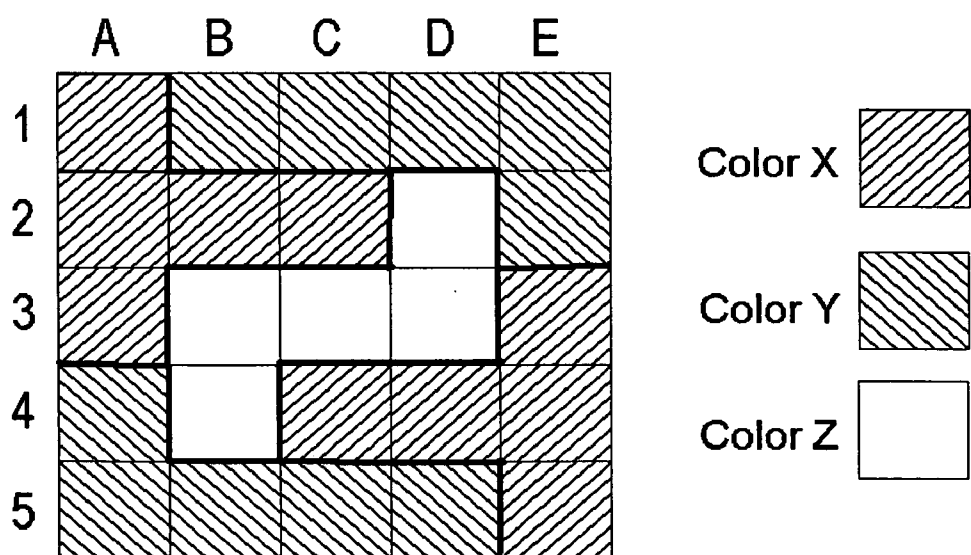


FIG.8 A diagram of the back side of the third pattern card.

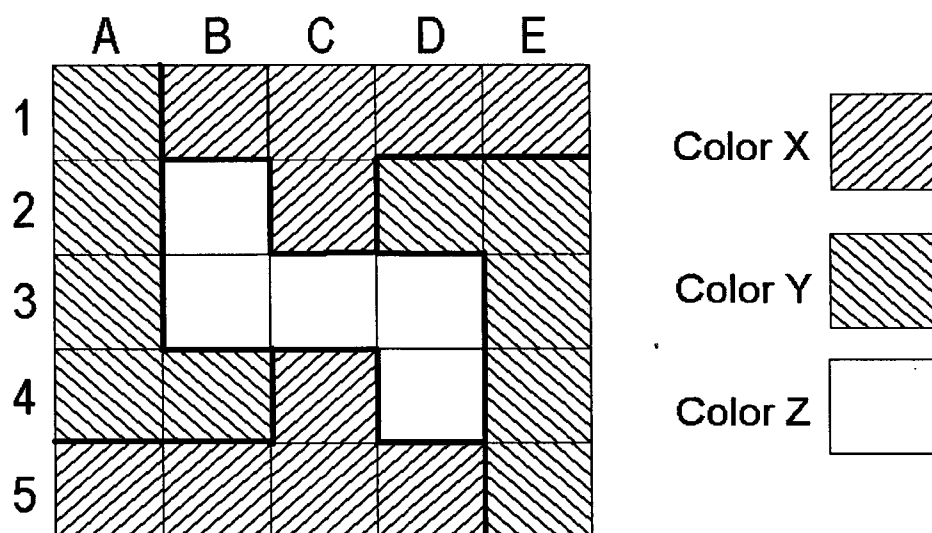


FIG. 9 A diagram of the front side of the fourth pattern card.

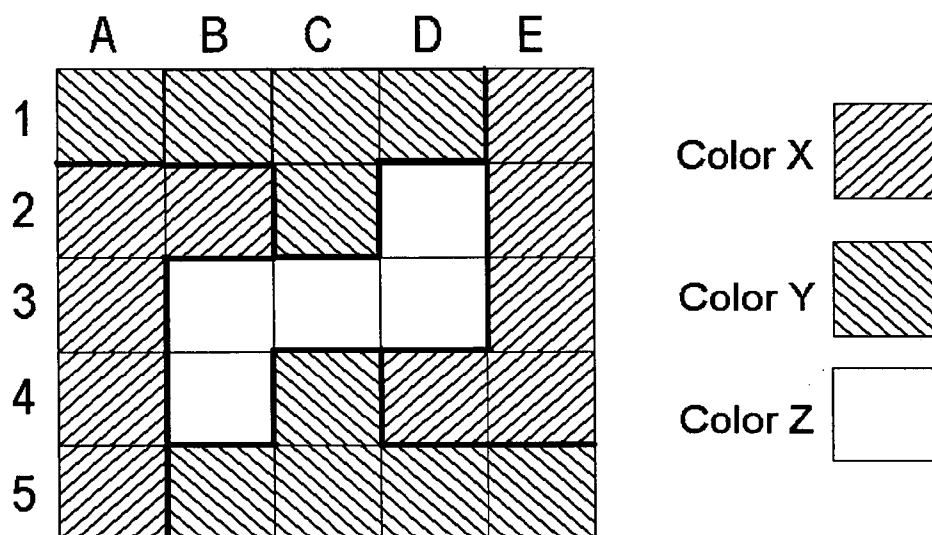


FIG. 10 A diagram of the back side of the fourth pattern card.

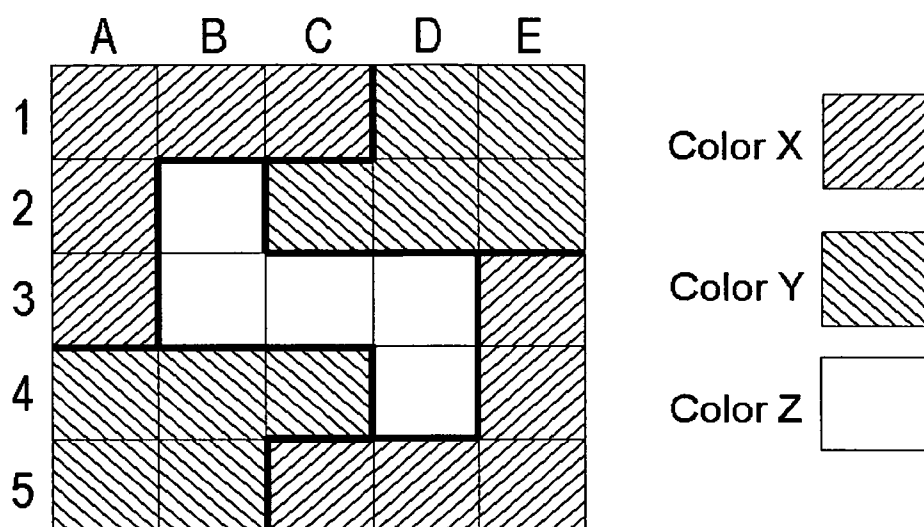


FIG.11 A diagram of the front side of the fifth pattern card.

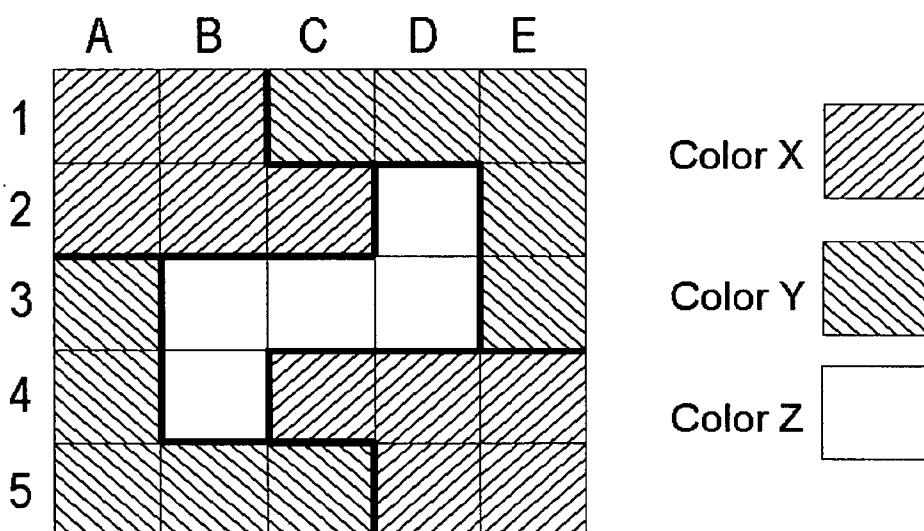


FIG.12 A diagram of the back side of the fifth pattern card.

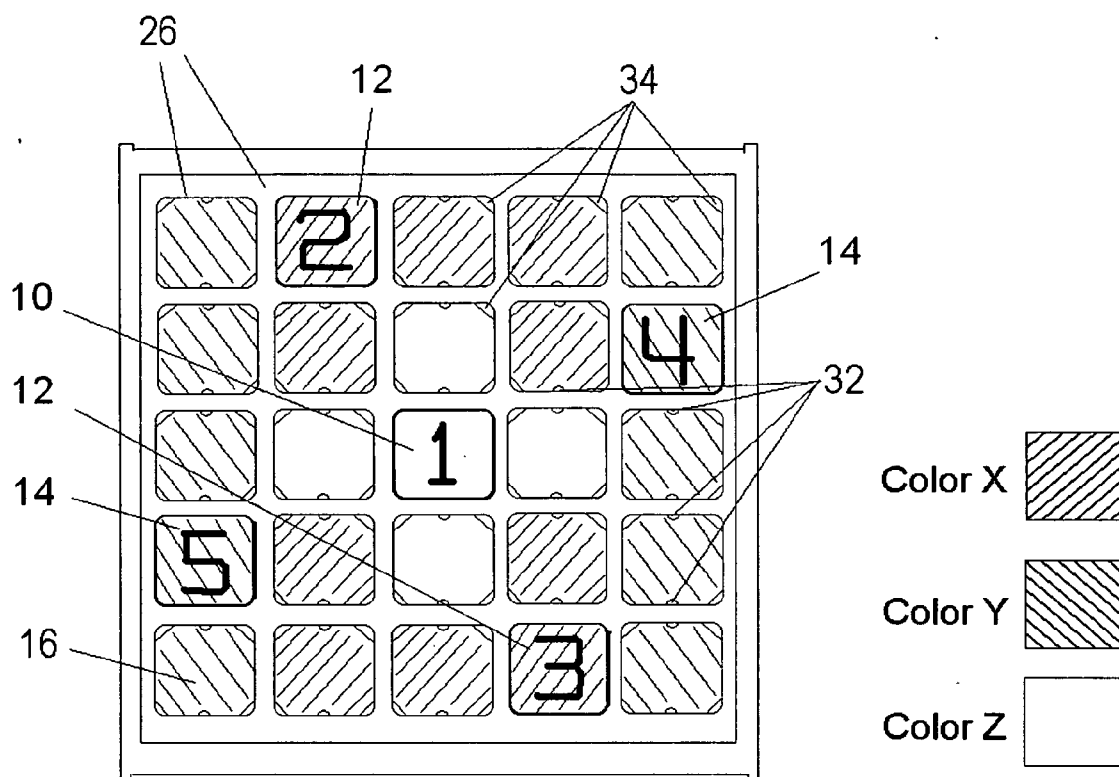


FIG. 13 Plan View of A Setup Puzzle with Playing Background of The First Pattern Card

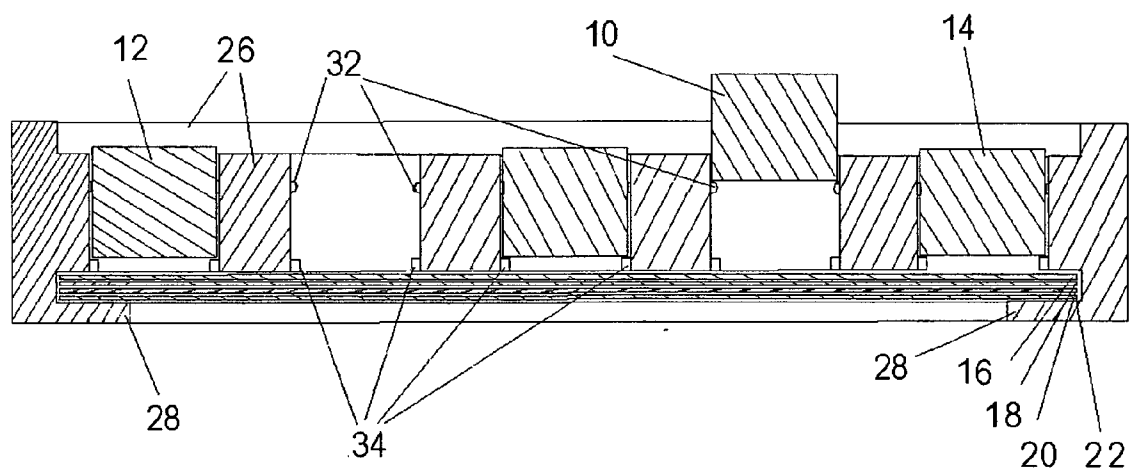


FIG. 14 Intersection View of the Playing Box with Positioned-in and Housed-in Cubes

APPARATUS AND METHOD FOR CONSTRUCTING NUMBER PUZZLES

U.S. PATENT DOCUMENTS

[0001]

6378866	April 2002	Graham-Ward	273/153
5649703	July, 1997	Kanbar	273/157
4583742	April 1986	Slinn	273/260.
4568082	February 1986	Musolino	273/157.
4548410	October 1985	Morrone	273/153
4494756	January 1985	Winer	273/156
4418915	December 1983	Calebs	273/159
4257609	March 1981	Squibbs	273/241
4216964	August 1980	Gans	273/153
4040630	August 1977	Brattain	273/157
3966209	June 1976	Gambardellla	273/153
3633913	January 1972	Solimene	273/153

FIELD OF THE INVENTION

[0002] The present invention relates to game and puzzles devices. Specifically, the present invention relates to a device for number puzzle and associated methods of using this device to construct number puzzles.

BACKGROUND OF THE INVENTION

[0003] There are many inventions on number puzzle games, but most of them are either too complicated to play, or too inconvenient to reset, such as having to lookup the some references or instructions. Also, the sizes of the prior arts are either too big to carry around in travel or the like, or have too many pieces to play with. The well-known SuDoKu number puzzle, which became world-wide popular, shows such shortages, wherein the puzzle setting-up has to refer to a complex-computed puzzle from a booklet, meanwhile a player has to either use pencil and paper, or operate eighty-nine pieces elements on a large game board.

[0004] A wide variety of puzzles devices is currently available on the commercial market and an even larger number of these types of devices are known in the art of puzzle devices, for example, the puzzle disclosed by Thurston in U.S. Pat. No. 490,689; the puzzle disclosed by Brown in U.S. Pat. No. 1,532,875; the puzzle disclosed by Haswell in U.S. Pat. No. 1,558,165; the puzzle disclosed by Clark in U.S. Pat. No. 4,410,180; the color match board game disclosed by Rowbal in U.S. Pat. No. 4,463,952; the matching puzzle with multiple solutions disclosed by Vogeler in U.S. Pat. No. 5,692,749; the twelve-sided polygon tile game and method of playing in U.S. Pat. No. 6,402,151; and the combined puzzle and container therefore in U.S. Pat. No. D353,167.

[0005] In U.S. Pat. No. 4,018,445, an educational game for playing a game of skill and judgment, the game comprising, at least one game board divided into a plurality of rows and columns of four in number, a plurality of numbered tokens for placing at each of the sixteen spaces defined on the game board by the rows and columns, each of said game boards having a numerical solution, the solution being as obtained by addition of the numbered tokens on the board after all spaces are filled, the addition being in any desired direction of any four of the tokens in abutting relationship or

in squares. In playing the game, numerical tokens are selected and placed on the game board until all spaces on each player's board are filled, the object of the game being to obtain the correct solution indicated for that particular game. Optionally, random number selector means may be used to select the order of playing the numbered tokens.

[0006] In U.S. Pat. No. 4,216,964, a number puzzle comprises a playing board having a planar surface with an odd number of squares arranged horizontally and vertically intersecting each other on the playing board, and a plurality of playing elements with each element having a different numbered indicia thereon. The elements being arrangeable on the squares of the playing board to satisfy a predetermined value which is defined by the arithmetical equations so that when the plurality of elements are properly positioned on the squares, the sum of the numbered indicia on the elements on each of the horizontal and vertical rows is equal to the predetermined value in accordance with the arithmetical equations.

[0007] In U.S. Pat. No. 4,548,410, a number puzzle comprises a series of nine tiles, number from "1" to "9" in seriatim are arrangeable in a three-times-three relationship and slidably disposed one recess of a housing, with the housing having an auxiliary recess to accommodate one of the tiles so as to slidably move the other tiles. The object of the game is to arrange the tiles so that when the numbers are added horizontally, vertically or diagonally, the sum is "15".

[0008] In U.S. Pat. No. 490,689, another two dimensional type puzzle is shown which discloses a two dimensional puzzle played with a playing board or box and individual tablets each of which contain a plurality of numerical indicia and a plurality of color indicia thereon. The various tablets are assembled within the box so that the number and color indicia appearing along each edge or quadrant of the tablets will match a corresponding set of indicia on the adjacent tablet. Thus, this reference simply teaches a matching type game in which no arithmetic solutions are provided, the numbers and colors simply serving as objects to be matched. A somewhat similar puzzle that also teaches a matching type solution is shown in British Patent Specification No. 173,588.

[0009] In summary, many conventional number puzzles, being either too difficult or too easy to solve for the average person, do not provide the personal reward or satisfaction that a person seeks in such puzzles. The present invention is designed for player's convenience. A two-dimensional five-times-five relationship square grid, which forms twenty-five square recesses arranged in five horizontal and five vertical rows intersecting each other, developed as an apparatus primarily for the purpose of providing a means for holding, laying, placing, positioning, and scattering number-indicia cubes, and a means for laying, inserting, swapping and matching the pattern cards that is set as background pattern of the puzzle playing surface, so that numerical indicia on each five cubes in the grid are unique horizontally, vertically and within each section of the background pattern, and the color indicia of the cubes match the background pattern's color indicia. This game also provides different levels of challenge, so that players at different ages can choose their own levels from the easiest to the most challenging.

SUMMARY OF THE INVENTION

[0010] The principal object of the present invention is to provide an apparatus and methods for players' easily constructing number puzzles themselves in accordance with three simply rules specified in this invention, without referring to any complex formulas, equations, or booklets.

[0011] Another object is to provide a number puzzle that is in hand-held mode and simple to play, readily to be carried and operated by a player during travel or the like, and economical in cost to manufacture.

[0012] Another object is to provide a number puzzle that can be reset without requiring complex and numerous rules and instructions.

[0013] Another object is to provide a number puzzle that is amusing and fascinating for either adults or young kids with different levels of challenge.

The Methods of Constructing the Puzzle

[0014] Firstly, select the five startup cubes in such a way that

[0015] a) Each cube has a unique number;

[0016] b) Only one cube is with central background color indicia;

[0017] c) Two cubes are with the first background color indicia and the other two cubes with the second background color indicia, or four cubes are with the same color indicia;

[0018] Secondly, place the cube with central color indicia into the center square recess of grid, and randomly place the rest of four cubes into the recesses in such a way that each pair of cubes with the same color indicia having 180-degree rotational symmetry about a central point of said grid center;

[0019] Thirdly, select one pattern card that can match the color indicia of the startup cubes in the grid and insert it into the pattern card slot as the puzzle background pattern, and arrange rest of twenty cubes to match the playing background color pattern, and flip the blank side of each of twenty cubes at the surface of the grid.

The Rules of Playing the Game

[0020] The five cubes with startup color indicia are initially scattered and positioned into the puzzle's playing surface, the five-times-five grid, in accordance with the methods described in the present invention, and they can not be moved, replaced, nor flipped over during the game.

[0021] In order to achieve the game's object, the rest of twenty cubes are rearranged and flipped over in the playing grid, displaying the numerical indicia so that each can remain unique horizontally, vertically and within the section with its background color indicia. These cubes can be moved, replaced and flipped over during the game, and the pattern cards can also be rotated, replaced and flipped over during the game in order to solve the puzzle.

[0022] The objects of the puzzle solution is that the numerical indicia displayed on each five cubes are unique, horizontally, vertically as well as within each section with the same color indicia of the selected pattern, and the color indicia of said cubes also need to match those of the background patterns.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] FIG. 1 is a top plan view of the playing box accordance with the present invention.

[0024] FIG. 2 is a diagram of the three types of playing cubes.

[0025] FIG. 3 is a diagram of the front side of the first pattern card.

[0026] FIG. 4 is a diagram of the back side of the first pattern card.

[0027] FIG. 5 is a diagram of the front side of the second pattern card.

[0028] FIG. 6 is a diagram of the back side of the second pattern card.

[0029] FIG. 7 is a diagram of the front side of the third pattern card.

[0030] FIG. 8 is a diagram of the back side of the third pattern card.

[0031] FIG. 9 is a diagram of the front side of the fourth pattern card.

[0032] FIG. 10 is a diagram of the back side of the fourth pattern card.

[0033] FIG. 11 is a diagram of the front side of the fifth pattern card.

[0034] FIG. 12 is a diagram of the back side of the fifth pattern card.

[0035] FIG. 13 is a plan view of a setup puzzle for a selected pattern card.

[0036] FIG. 14 is a intersection view of the playing box with positioned-in and housed-in cubes.

LIST OF REFERENCE NUMBERS

[0037] With regard to reference numerals used, the following numbering is used throughout the drawings and descriptions.

[0038] 10 the Numbered Cubes with the Center Background Color Indicia

[0039] 12 the Numbered Cubes with the First Background Color Indicia

[0040] 14 the Numbered Cubes with the Second Background Color Indicia

[0041] 16 the First Pattern Card

[0042] 18 the Second Pattern Card

[0043] 20 the Third Pattern Card

[0044] 22 the Fourth Pattern Card

[0045] 24 the Fifth Pattern Card

[0046] 26 Recesses of the Grid on the Playing Box

[0047] 28 Pattern Card Slot

[0048] 30 Playing Box Lid

[0049] 32 Cube Position Holders

[0050] 34 Cube Seats

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0051] As shown in FIG. 1, FIG. 11 and FIG. 12, the five-number puzzle game comprising a flat box that has twenty-five square recesses 26, in the five-times-five relationship, in the grid on its surface, in which twenty-five cubes 10, 12 and 14 can be laid on, positioned-in with flexible connection of cube position holders 32, or can be pushed-in to the cube seats of each recess 34, and a pattern card slot 28 at the bottom of the playing box into which the pattern cards 16, 18, 20, 22 and 24 can be inserted and slid into said slot so as to become a playing pattern background of said flat box. The grid is made of transparent material so that the player can view the inserted playing background patterns. The box opens by sliding the card out of the slot so that the player can push out the positioned-in or housed-in cubes for resetting the new puzzle games. The grid forms twenty-five square recesses arranged in five horizontal and five vertical rows intersecting each other. The lid of the box 30 is for holding the playing cubes during the game.

[0052] As shown in FIG. 2, the present apparatus also comprises twenty-five cubes, among which five of said cubes 10 having the background color indicia identical with the color indicia of the center section of the pattern cards, ten of said cubes 12 having the first background color indicia, same as the first background color indicia of the pattern cards, and the other ten of said cubes 14 having the second background color indicia, same as the second background color indicia of the pattern cards. All the twenty-five cubes are imprinted with the numbered indicia from "1" to "5" in the five of six sides of said cubes, and with the sixth side blank without any imprint.

[0053] The pattern cards are the key elements to setup number puzzles. On the pattern cards, there are three colors, the center color, the first background color and the second background color, that divide twenty-five squares into the five sections. Mathematically, the first and the second color indicia are not mutual exchangeable when manufacturing a particular pattern card because of the puzzle solutions are associated with each other among these ten patterns. The squares of each section are adjacent one another. The sections with the same color indicia have 180-degree rotational symmetry about a central point of the pattern. The pattern on each card with different literal indicia represents a level of puzzle difficulty. The five described patterns are such designed that any puzzle setup in accordance with methods of puzzle construction in present invention is always solveable when the appropriate puzzle-associated pattern is selected as its playing background. In another words, there is a definite solution for any puzzle within the scope of these five pattern cards.

[0054] The five preferably designed patterns are described by using the A, B, C, D and E as their horizontal index, and 1, 2, 3, 4 and 5 as their vertical index.

[0055] As shown in FIG. 3, in the pattern on the front side of the first pattern card 16, A1, B1, C1, D1, E1, A5, B5, C5, D5 and E5 are in the first background color indicia; A2, B2, D2, E2, A3, E3, A4, B4, D4, and E4 are in the second background color indicia; C2, B3, C3, D3, and C4 are in the center color indicia.

[0056] As shown in FIG. 4, in the pattern on the back side of the first pattern card 16, A1, B1, C1, D1, E1, A5, B5, C5,

D5 and E5 are in the second background color indicia; A2, B2, D2, E2, A3, E3, A4, B4, D4, and E4 are in the first background color indicia; C2, B3, C3, D3, and C4 are in the center color indicia.

[0057] As shown in FIG. 5, in the pattern on the front side of the second pattern card 18, A1, B1, A2, B2, A3, E3, D4, E4, D5, and E5 are in the first background color indicia; D1, E1, D2, E2 D3, B3, A4, B4, A5, and B5 are in the second background color indicia; C1, C2, C3, C4 and C5 are in the center color indicia.

[0058] As shown in FIG. 6, in the pattern on the back side of the second pattern card 18, A1, B1, A2, B2, B3, D3, D4, E4, D5, and E5 are in the first background color indicia; D1, E1, D2, E2 E3, A3, A4, B4, A5 and B5 are in the second background color indicia; C1, C2, C3, C4 and C5 are in the center color indicia.

[0059] As shown in FIG. 7, in the pattern on the front side of the third pattern card 20, A1, B1, C1, D1, A2, E4, B5, C5, D5, and E5 are in the first background color indicia; E1, C2, D2, E2 A3, E3, A4, B4, C4, and A5 are in the second background color indicia; B2, B3, C3, D3, and D4 are in the center color indicia.

[0060] As shown in FIG. 8, in the pattern on the back side of the third pattern card 20, A1, A2, B2, C2, A3, E3, C4, D4, E4, and E5 are in the first background color indicia; B1, C1, D1, E1, E2, A4, A5, B5, C5, and D5 are in the second background color indicia; D2, B3, C3, D3, and B4 are in the center color indicia.

[0061] As shown in FIG. 9, in the pattern on the front side of the fourth pattern card 22, B1, C1, D1, E1, C2, C4, A5, B5, C5, and D5 are in the first background color indicia; A1, A2, A3, A4 B4, D2, E2, E3, E4, and E5 are in the second background color indicia; B2, B3, C3, D3, and D4 are in the center color indicia.

[0062] As shown in FIG. 10, in the pattern on the back side of the fourth pattern card 22, A1, B1, C1, D1, C2, C4, B5, C5, D5, and E5 are in the second background color indicia; A2, B2, A3, A4, A5, E1, E2, E3, D4, and E4 are in the first background color indicia; D2, B3, C3, D3, and B4 are in the center color indicia.

[0063] As shown in FIG. 11, in the pattern on the front side of the fifth pattern card 24, A1, A2, A3, B1, C1, E3, E4, E5, D5, and C5 are in the first background color indicia; A4, A5, B3, B4, B5, D1, D2, D3, E1 and E2 are in the second background color indicia; B2, C2, C3, C4, and D4 are in the center color indicia.

[0064] As shown in FIG. 12, in the pattern on the back side of the fifth pattern card 24, A1, A2, B1, B2, B3, D3, D4, D5, E4 and E5 are in the first background color indicia; A3, A4, A5, B5, C1, C5, D1, E1, E2 and E3 are in the second background color indicia; B4, C2, C3, C4, and D2 are in the center color indicia.

[0065] While preferred specific embodiments of the present invention are hereinbefore set forth, it is to be clearly understood that the invention is not to be limited to the exact constructions, materials, devices, symbols and colors illustrated and described hereinbefore because various modifications of these details may be provided in putting this invention into practice.

What is claimed is:

1. A number puzzle device and method comprising:
 - a) Twenty-five cubes with three background color indicia, as well as five numerical indicia, from "1" to "5";
 - b) Twenty-five squares divided into five-times-five relationship square recesses on the grid for placing and holding the said cubes;
 - c) A plurality of pattern cards, each dividing five-times-five relationship squares into five different adjacent sections in a particular pattern with three different background color indicia;
2. A number puzzle device according to claim 1 in which the twenty-five cubes are imprinted on the five sides, with each side having a unique numbered indicia, with the blank on the sixth side of said cubes.
3. A number puzzle device according to claim 1 in which among the twenty-five said cubes, five of them have the background color indicia identical with the color indicia of the center section of the pattern cards, ten of them have the first background color indicia of the pattern cards, and the other ten of them have the second background color indicia of the pattern cards.
4. A number puzzle device according to claim 1 in which a plurality of pattern cards, each dividing five-times-five relationship grid squares into five five-adjacent-square sections, forming a plurality of patterns that serve as the playing background of the puzzle.
5. A number puzzle device according to claim 1 in which each pattern card has a specific section in the grid center with identical background color indicia on the said section, and two pairs of sections around the said center section, each pair of said sections with the identical background color having 180-degree rotational symmetry about a central point of said grid center, and squares with the same color indicia within each section are adjacent one another.
6. A number puzzle device according to claim 1 in which each pattern as the playing surface is representing the

different level of complexities of the puzzle, and the patterns on the cards are such designed and selected that any puzzles setup in accordance with the methods of puzzle construction described in the present invention are definitely solvable.

7. A number puzzle device according to claim 1 in which the five-times-five relationship square on the grid forms twenty-five square recesses arranged in five horizontal and five vertical rows intersecting each other.

8. A number puzzle device according to claim 7 in which each square recess on the grid can hold and house in the playing cubes so that the held cube can be easily moved, replaced, flipped over and housed-in cube can not be easily moved, replaced, nor flipped over.

9. A number puzzle device according to claim 7 in which the grid has a slot where the pattern cards can easily be inserted in, moved out, replaced by other cards, and displayed as the playing background of the grid.

10. A number puzzle device according to claim 7 in which the grid is transparent so that the player can view the patterns and colors of the playing background of the pattern cards.

11. A Method of constructing the puzzle to claim 1 that the five puzzle startup cubes are selected in such a way that

- d) each cube has a unique number;
- e) only one cube is with central background color indicia;
- f) two cubes are with the first background color indicia and the other two cubes with the

second background color indicia, or four cubes are with the same color indicia; then, the cube with central color indicia is placed into the center square recess of grid, and the rest of four cubes into the recesses are randomly placed in such a way that each pair of cubes with the same color indicia having 180-degree rotational symmetry about a central point of said grid center;

* * * * *