United States Patent [19]

Tuan

[11] **3,747,931**

[45] **July 24, 1973**

[54] **THREE-DIMENSIONAL TICK-TACK-TOE**

[76] Inventor: **Pao-Hwa Tuan,** 262 W. 107 St., Apt. 4A, New York, N.Y. 10025

[22] Filed: **July 26, 1971**

[21] Appl. No.: **166,121**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 18,469, March 11, 1970, abandoned.

[52] **U.S. Cl. 273/130 A,** 273/130 AB, 273/130 AC, 273/130 B

[51] **Int. Cl.** **A63f 3/00**

[58] **Field of Search**..... 273/130, 131, 135, 273/136, 145

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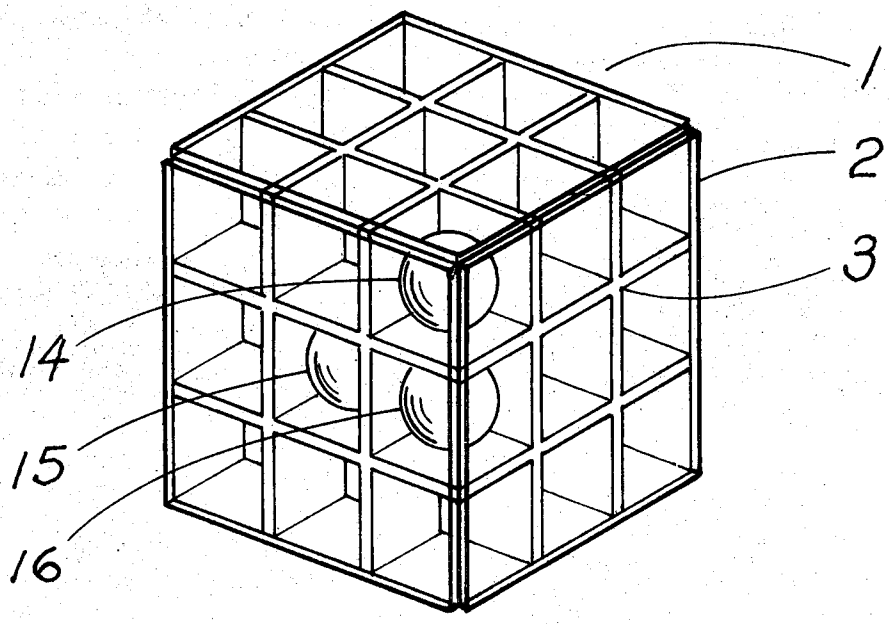
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Primary Examiner—Delbert B. Lowe
Attorney—Elmer R. Helferich et al.

[57] **ABSTRACT**

A three-dimensional tick-tack-toe game apparatus which includes a cubical grid structure having 26 separate play making compartments all of which are readily accessible from the sides of the grid structure, the grid structure being an assembled structure of a plurality of partitions or a solid component. Transparent removable covers are provided for each of the grid structure sides. Play markers for use in the respective compartments can be beads, or lights may be embodied in the compartments to denote play with suitable switch controls for the lights also being provided.

13 Claims, 25 Drawing Figures



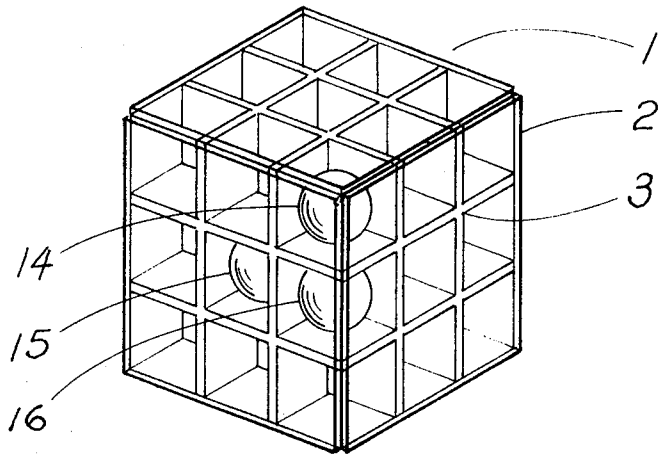


FIG. 1

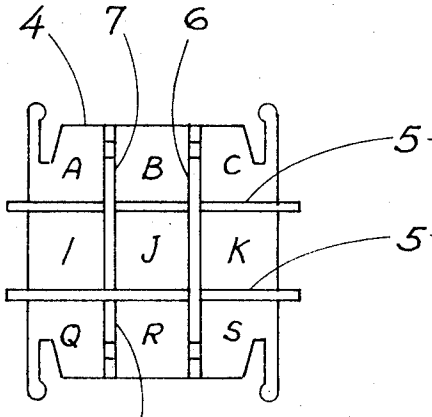


FIG. 2

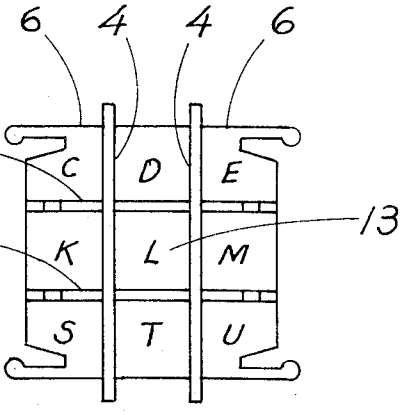


FIG. 3

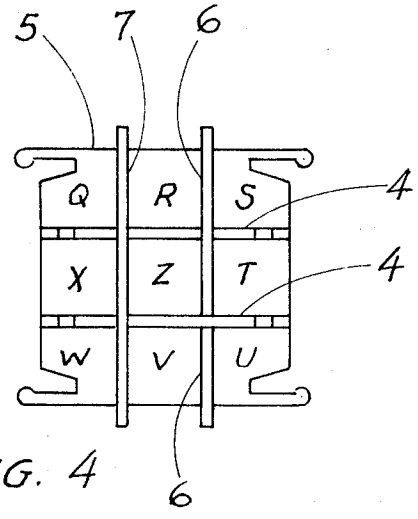


FIG. 4

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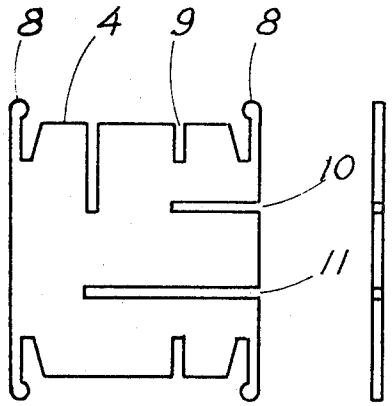


FIG. 5

FIG. 6

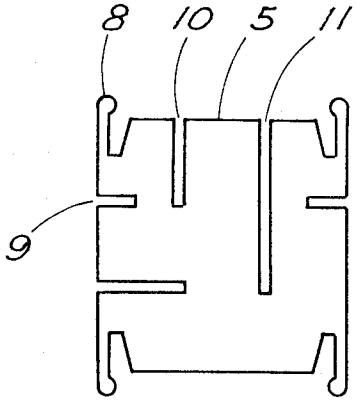


FIG. 7



FIG. 8

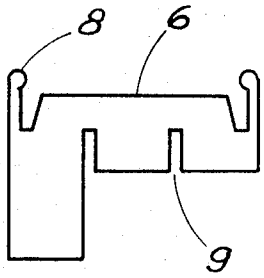


FIG. 9



FIG. 10

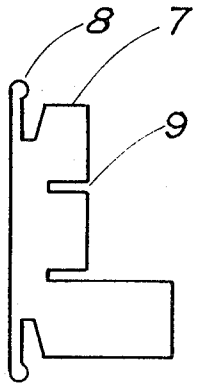


FIG. 11



FIG. 12

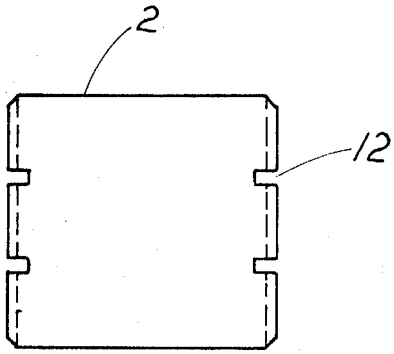


FIG. 13



FIG. 14

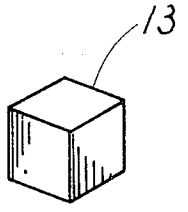


FIG. 16

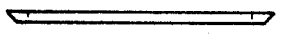


FIG. 15

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FIG. 17

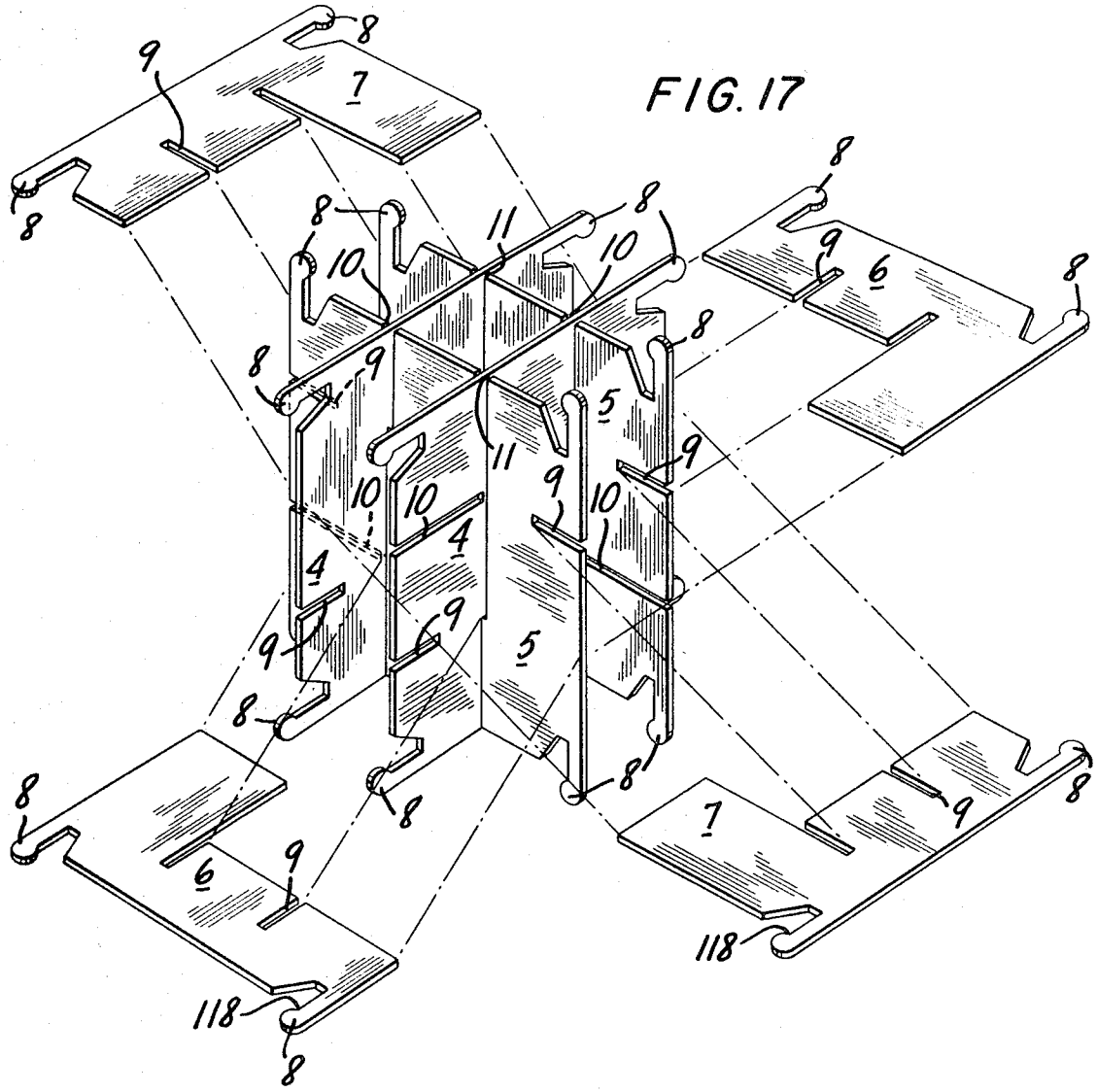
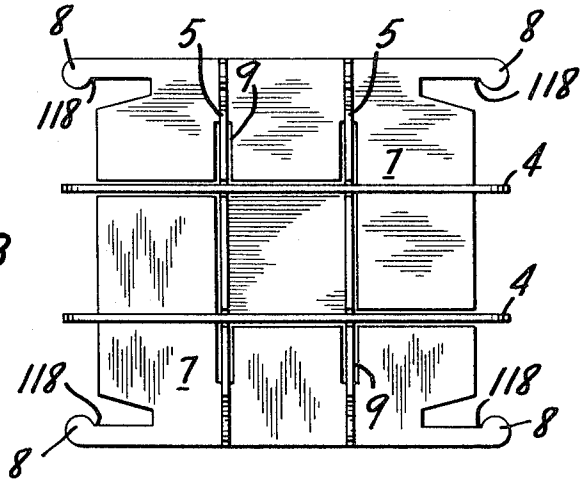


FIG. 18



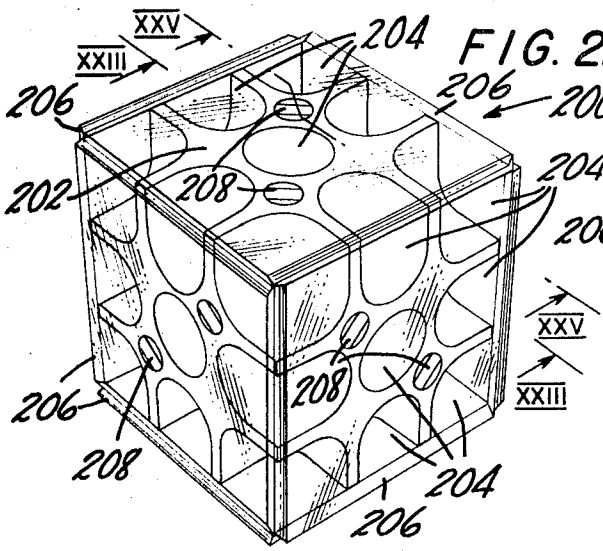


FIG. 22

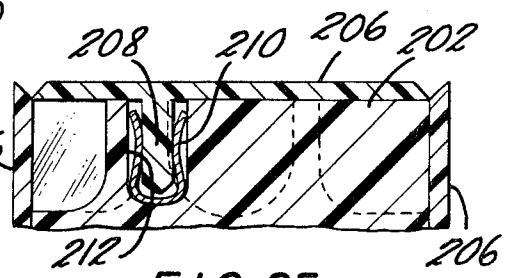


FIG. 25

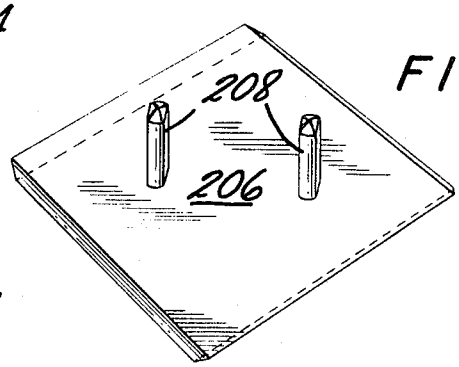


FIG. 24

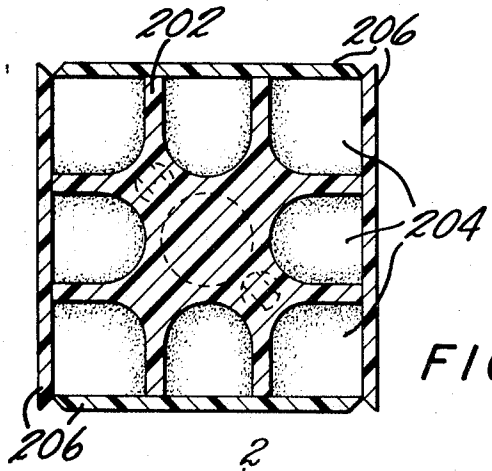
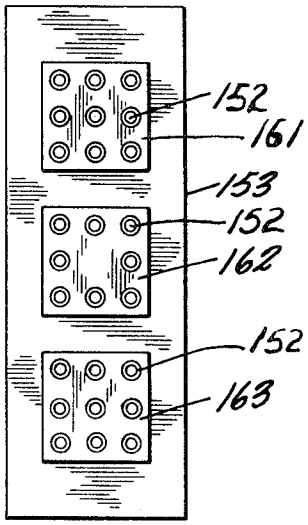


FIG. 23

FIG. 20



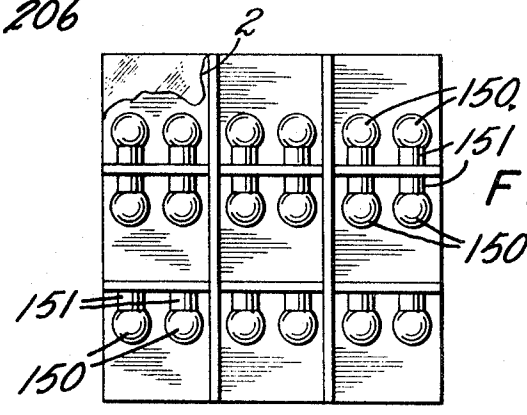
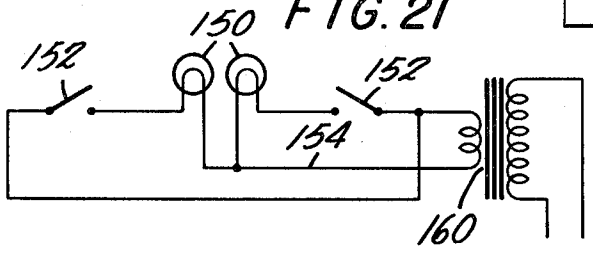


FIG. 19

FIG. 21



THREE-DIMENSIONAL TICK-TACK-TOE

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of my copending application Ser. No. 18,469 filed Mar. 11, 1970, now abandoned.

BACKGROUND OF THE INVENTION

The present invention relates to improvements in game apparatus and more particularly to game apparatus for playing three-dimensional tick-tack-toe.

Game apparatus for playing three-dimensional tick-tack-toe wherein a principal component of the apparatus is a three level, three-dimensional grid structure, having plural play marker receiving compartments, is known. Such apparatus for playing three-dimensional tick-tack-toe however has a number of undesirable features. For one thing in order to provide access to certain middle or centrally located compartments, especially at the lowermost of the playing levels of the grid structure, it is necessary to omit a portion of the compartment defining structure from the grid, so that at least certain ones of the compartments are not wholly separate from all of the others. Furthermore, such apparatus as is known is not suitable for manipulation of the grid structure to position it so a given one of the playing sides can be positioned facing a player to allow ready access for inserting a playing marker such as a bead in a given compartment. The latter cannot be effected since turning of the grid, as for example, by inverting the same would result in emptying of playing markers from the compartments at one or more sides of the grid structure. Thus the desirable need of retaining playing markers in all compartments cannot be achieved so that ready visual determination of the game standing is possible. Where a retaining means for use with such game apparatus has been provided, such retaining means comprises a baseboard for supporting the cubical grid which is permanently secured thereto and which inhibits access to all compartments in the lowermost playing level of the grid. Alternatively such retaining means has been provided as a five sided enclosure formed as a single element received enclosingly over the whole grid structure. The latter thus only can be inserted over the cubical grid at the end of play making in all compartments at the sides of the grid. Thus there is no allowance for playing at one side of the grid to completion of the game possibilities at that side, followed by insertion of a retaining means on said side so that the players may proceed then to play at an adjacent side of the grid without fear that the markers in compartments at the first playing side will accidentally empty therefrom.

SUMMARY OF THE INVENTION

The present invention is concerned generally with improvements in game apparatus and specifically with improvements in an apparatus for playing three-dimensional tick-tack-toe.

An object of the invention is to provide three-dimensional tick-tack-toe apparatus which is compact in construction, easy to play with, and which is readily portable so that it can be used at any location and time a player may find convenient for such purpose and recreation.

Another object of the present invention is to provide a three-dimensional tick-tack-toe apparatus which permits the players to play at one side of the cubical grid structure of the apparatus until completion of play at such side and then progress on in play at an adjacent side without hazard that any playing markers inserted in compartments at the first side of the grid will accidentally empty from such compartments.

Another object of the invention is to provide apparatus that is attractive in appearance so that it can be enjoyed not only as a game but as a toy or also as an object of art.

In accordance with the present invention, the apparatus includes as a principal component a cubical grid structure having six sides each of which is provided with a number of playing compartments each intended to receive or house a playing marker means. The total number of playing compartments provided in the grid structure is 26 with each side of the grid structure having nine separate playing compartments and arranged such that at least some of the compartments at any given side are in common with those of an adjacent side. The cubical grid structure can be made in various forms, as for example it may comprise a plurality of interfitting partitions, the partitions being generally flat strip-like elements fitted with an arrangement of slots to facilitate the interfitting of each partition with one or more of the others. The grid structure also may be provided as a solid component having 26 compartments formed in and arranged around the six sides thereof.

Transparent covers are provided for covering each of the six sides of the grid which covers serve to retain any playing markers received in the compartments at such sides during the course of play. The cover members as well as the respective sides of the cubical grid are provided with cooperating cover retaining means, the means so provided being such that the covers are readily removable from the sides of the cubical grid.

A further feature of the invention provides that the respective compartments in the cubical grid may be provided with colored lamps to denote play in such compartments instead of using playing markers, and accordingly a suitable control device and circuitry mechanism are provided to control lighting the lamps when playing the game.

DESCRIPTION OF THE DRAWINGS

Other objects of the invention will in part be obvious and will in part appear from the following detailed description taken in connection with the accompanying drawings wherein like reference numerals identify similar parts throughout, and in which:

FIG. 1 is perspective view of one form of the game apparatus of the present invention, the cubical grid structure being comprised of a plurality of interfitting partitions, the sides of the structure being covered with transparent cover pieces.

FIG. 2 is an elevational view of the cubical grid structure with the cover pieces removed therefrom.

FIG. 3 is a side view of the structure depicted in FIG. 2.

FIG. 4 is a bottom view of the structure shown in FIG. 2.

FIG. 5 is a plan view of one of the partitions from which the grid structure is assembled, two such partitions being required.

FIG. 6 is a right edge view of FIG. 5.

FIG. 7 is a plan view of another partition used in the grid structure, two such partitions being required.

FIG. 8 is a right edge view of FIG. 7.

FIG. 9 is a plan view of still another partition used in the grid structure, two such partitions being required.

FIG. 10 is a right edge view of FIG. 9.

FIG. 11 is a plan view of a further partition used in the grid structure, two such partitions being required.

FIG. 12 is a right edge view of FIG. 11.

FIG. 13 is a plan view of a transparent side cover used on the cubical grid structure depicted in FIGS. 2–4, six such covers being used.

FIG. 14 is a right edge view of FIG. 13.

FIG. 15 is a bottom edge view of FIG. 13.

FIG. 16 is a perspective view of a cube insert received in the center compartment of the cubical grid structure.

FIG. 17 is an exploded perspective view depicting the manner in which the partitions shown in FIGS. 5–12 are assembled to form the cubical grid structure depicted in FIGS. 2–4.

FIG. 18 is a top plan view of the assembled grid structure shown in FIG. 17.

FIG. 19 is a side elevational view of the dubical grid structure illustrating the employment of light bulbs in the respective compartments as markers in place of the beads depicted in the apparatus in FIG. 1.

FIG 20 IS A PLAN VIEW OF A CONTROL OR SWITCH BOARD USED FOR CONTROLLING OPERATION OF THE COMPARTMENT LIGHTS SHOWN IN FIG. 19.

FIG. 21 is a circuit diagram associated with the control board and lights illustrated in FIGS. 19 and 20.

FIG. 22 is a perspective view of a different form of the game apparatus wherein the cubical grid structure is a solid component as distinguished from the assembled plural partition structure shown in FIG. 1.

FIG. 23 is a sectional view taken along the lines 23–23 in FIG. 22.

FIG. 24 is a perspective view of a side cover used in conjunction with the apparatus depicted in FIG. 22.

FIG. 25 is a sectional view as taken along the line 25–25 in FIG. 22.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 depicts one form of apparatus 1 of the present invention with which three-dimensional tick-tack-toe can be played. As can be noted, the apparatus 1 includes a cubical grid structure 3 having the six sides of a cube and 26 compartments therein (the compartments being designated by the capital letter references in FIGS. 2–4), the compartments being arranged such in the grid structure that nine compartments are accessible from each side of the grid structure. The apparatus 1 also includes a separate cover 2 associated with each side of the cubical grid structure, the covers 2 being removably retained on the grid sides. The apparatus 1 also includes player marker means depicted for convenience as being beads 14, 15 and 16 although, as will be apparent later on, other forms of marker means can be used.

In the apparatus 1, the cubical grid structure 3 is provided as an assembly of a plurality of interfitting generally flat partitions. In describing the construction of grid structure 3, continuing reference should be had to FIGS. 2–12 and 17 and 18 which together depict the various shapes of partitions used as well as the manner of their assembly. The assembly includes two partitions 4 (FIGS. 5 and 6), two partitions 5 (FIGS. 7 and 8), two partitions 6 (FIGS. 9 and 10), and two partitions 7 (FIGS. 11 and 12). To facilitate interfitting of the partitions they are each provided with one or more slots identified as short length slots 9, medium length slots 10 and long length slots 11. To assemble the grid structure 3 from the various partitions, two partitions 4 are placed vertically in parallel spaced relation as shown in FIG. 17 with the long slots 11 of each painting down. The two partitions 5 are then fitted to the partitions 4 with the long slots 11 of the partitions 5 straddling the solid portion of the partitions 4 aligned with medium length slots 10 of the partitions 4. The two partitions 7 are then fitted to the partitions 4 and 5 to form the upper level of the grid with the short slots 9 therein being received in a corresponding short slot 9 in one of the partitions 4 and 5, the reception course of such partitions 7 being shown in short and long dashed lines in FIG. 17 from which it will be noted also the corresponding surfaces of the partitions 4 and 5 against which the inner edge surfaces of the partitions 7 abut when fitted. The two partitions 6 are then fitted in similar fashion to partitions 4 and 5 to form the lowermost level of the grid structure, with the middle level being that between the fitted partitions 6 and 7. Thus it will be noted, the various partitions provide three pairs of parallel spaced square grid walls disposed perpendicular to and intersecting each of the remaining pairs with the circumferential edges of the grid walls of each pair of grid walls being in planar alignment with each other and at least a portion of the circumferential edges of one other pair to define therewith a planar side of the cubical grid structure.

As noted above, 26 compartments are formed in the cubical grid structure 3 which all are of substantially equal volume and accessible from a side of the grid structure, the geometrical arrangement of the compartments in the depicted structure themselves being cubical and being such that nine compartments are accessible from any given side. When the grid structure is formed from the partitions 4, 5, 6, and 7 as above described (and when so assembled the partitions can be permanently secured together in any convenient manner as with an adhesive) 27 compartments are actually formed in the grid, one such compartment being located geometrically centrally in the grid structure. However, such compartment is plugged with a plug 13 (FIG. 16) so that there remain only the 26 operative compartments for play making, none compartments being contained in each of the grid upper and lower levels and eight in the middle level.

FIGS. 13–15 illustrate a cover which is used to cover over the sides of the cubical grid structure 3, there being provided six such covers. The cover 2 is a flat transparent or translucent member of square shape having notches 12 formed in opposite side edges thereof, and being coextensive with a side of the grid structure. For removably retaining the covers 2 on the sides of the grid structure 3, the partitions 4, 5, 6, and 7 are provided with projecting lug structure 8 including a necked down part providing a locking recess 118. The covers 2 thus can be snapped in place on the side of the grid structure by receiving the notches 12 thereof over the lug structure until the notches engage and seat in the locking recesses 118, the lug structure

being sufficiently deflectably yieldable to accomodate passage of the notches therealong. The covers **2** also are beveled along opposite edges facing or toward the grid structure when the cover is mounted to facilitate digital access for a player's finger to initiate removal of the cover. Other means of attaching the covers **2** to the cubical grid structure also could be used including hinges, magnets, clips, etc. The advantage of providing separate side covers **2** is that once play making has been completed at one side of the grid structure, a cover can be mounted therein to retain the markers **14–16** in the compartments thereof without hazard that they will empty therefrom when the apparatus is moved, turned or inverted to pursue play at another side of the grid.

The play marker means or beads **14–16** can be provided in various forms. While being depicted as being spheres or balls, they could be of any configuration and size although it is preferable that in relation to the size of the grid compartments the beads be sufficiently large so that only one can be received in a compartment. Furthermore, the markers can be provided in two or more sets in which the beads of one set are distinguishably identifiable from those in another set.

The game played with the apparatus **1** is to be played primarily by two players in the same manner as two-dimensional tick-tack-toe is played. The X and O of the old game are replaced with markers such as beads. As there are **26** cavities in the whole apparatus, each player preferably has 13 beads of one color or kind.

There are many times more straights (three in a straight line) in this three-dimensional game than in the simple two-dimensional type. As shown in FIG. **1**, the cavity where bead **14** is located has a possibility to make three straights in one plane, and three more in other planes, hence six straights in all. Bead **15** has a possibility of four straights, but bead **16** has only two possibilities on one plane and one more on another plane, a total of three straights.

The plugged center hole of the grid structure, as described above, could provide 13 possibilities of interplanar straights. Therefore, who ever gets this hole would almost be a certain winner. To make the game fair to both players the hole is plugged and eliminated.

When the game is played by more than two players, more beads of different colors can be provided. Each player may have the same number of beads of one color. The play will be as usual, that each contestant lodges his bead into the apparatus in turn, and when all beads are lodged, the straights are to be counted to determine the winner.

The apparatus is so designed that it can be made on any scale. Hence a ⅛ inch diameter bead or even smaller can be used so that the apparatus can be carried in a pocket or handbag. It can be played on a table, in the hand, on the beach, in a bus or train without difficulty.

On the other hand, the apparatus may be made large enough to be placed in the middle of a table at a party or hung from the ceiling of a play room to be played by teams, each of any number of players. Within each team members can study and decide by majority for the placement of each bead, an actual practice of a democratic system, thus making the game an educational toy.

If a very large apparatus is used, as for example, as a party game, it may be desirable to use a different form of marker means than beads for convenience of the players. Thus lights located in the respective compartments can serve such purpose. FIGS. **19–21** show such form of marker means.

FIG. **19** shows a large size apparatus in which are provided in each compartment light bulbs **150** and their sockets **151**, only a portion of a transparent or translucent side cover **2** being shown on such large size apparatus.

Each socket **151** is wired respectively to button operated switch **152** on a switch board **153** (FIG. **20**) so that each bulb in each compartment may be operated individually by its respective switch.

FIG. **21** is a schematic view showing the manner of the connection of the light bulbs **150** to their respective switches **152.** One of the two wire terminals of each bulb **150** is connected to a common wire **154** or the ground of the unit. The other one is connected to the corresponding switch **152** on the switch board **153.** All the lights can be supplied by a single current or power source. When house current is used it may be connected directly, or when low voltage bulbs are used a transformer **160** may be used.

At least two switch boards **153** are needed for one unit to control the different colored lights belonging to different players. On each of the switch boards is provided three groups of switches **161, 162** and **163** each being used for controlling the lights of one level of the grid. On each group three rows of switch control buttons located geometrically resembling one level of the grid are provided. Since the center compartment of the middle level **162** is not in use this center switch control may be omitted.

In play each player will have the possession of one switch board, and each will light a compartment alternately in the same manner as when beads are used.

FIGS. **22–24** depict a further form of the apparatus **200** wherein the cubical grid structure **202** is formed as a solid component of unitary construction. Thus the grid structure, which the 26 compartments **204,** can be molded, machined from a solid cube, etc. It also could be formed from two molded semi-cubical elements which are joined together in suitable fashion to form a single structure. The apparatus **200** also is provided with individual or separate side covers **206,** the side covers each having a pair of lugs **208** thereon which are received in spring clip members **210** housed in passages **212** formed in the sides of the grid structure for retaining the covers in place on the grid structure as shown particularly in FIG. **25.**

While the compartments **204** are shown as being rounded at the inner reaches thereof it will be understood that they may be cubical in shape if such shape better suits manufacturing requirements. The apparatus **200** is a particularly compact unit and is ideally suited for carrying in a person's pocket in a cube size of 1 ½ to 2 inches.

From a reading of the foregoing it will be apparent that certain modifications can be made in the construction of the apparatus. For example, in a very large form thereof, individual covers could be provided for each compartment of the grid. Thus compartments at the corners of the grid would have 3-sided covers. Intermediate edge compartments would have 2-sided covers and centrally located compartments at each side a single plate cover. Retention of such covers could be with suitable spring clips attached to the cover and engage-

able with the grid structure defining the compartments for frictional holding, or with such other holding means as screw fasteners, etc.

What is claimed is:

1. Apparatus for playing three-dimensional tick-tack-toe comprising

a cubical grid structure having six sides thereof and 26 compartments therein, said compartments being arranged such in said grid structure that nine thereof are accessible from each side of said grid structure,

playing marker means loosely receivable in each of said compartments.

separate cover means for each side of said cubical grid structure, and

cooperating retaining means on each of said separate cover means and each side of said cubical grid structure for removably retaining said separate cover means in covering position on the sides of said cubical grid structure to prevent removal of said marker means from the compartments of an associated side if said grid structure is turned, inverted or otherwise moved following placement of said marker means therein during the course of play.

2. The apparatus of claim **1** wherein said separate cover means comprises a separate cover associated with and coextensive with each side of said cubical grid.

3. The aparatus of claim **2** wherein each of said covers is transparent.

4. The apparatus of claim **2** wherein said retaining means comprise projecting lug structure on each side of said grid structure, said lug structure including a locking recess, and notches on each cover means receivable over lug structure of its associated grid side for engagement with the locking recess thereof to retain said cover in covering position on said grid side.

5. The apparatus of claim **2** wherein each of said covers has edges which are beveled toward said cubical grid structure when said cover is retained thereon to facilitate digital access for removing said cover.

6. The apparatus of claim **2** wherein said cooperating retaining means comprises lugs fixed to each separate cover, and spring clips retained in each side of said cubical grid structure, said lugs being removably received in said spring clips for retaining each cover on its associated side of said cubical grid structure.

7. The apparatus of claim **1** wherein said cubical grid structure is comprised of a single component of unitary construction.

8. The apparatus of claim **1** wherein said playing marker means comprises at least two sets of markers, the markers of one set being distinguishably identifiable from those of any other set.

9. The apparatus of claim **8** wherein said markers are beads.

10. The apparatus of claim **9** wherein the compartments of said grid structure are sized such in relation to the size of said beads that only one thereof can be received in a compartment.

11. Apparatus for playing three-dimensional tick-tack-toe comprising

a cubical grid structure having six sides thereof and twenty-six compartments therein, said compartments being arranged such in said grid structure that nine thereof are accessible from each side of said grid structure,

two sets of playing marker means, those of one set bieng distinguishably identifiable from those of the other set, there being one marker from each set mounted in each of said compartments,

separate cover means for each side of said cubical grid structure, and

cooperating retaining means on each of said separate cover means and each side of said cubical grid structure for removably retaining said separate cover means in covering position on the sides of said cubical grid structure,

said markers comprising light bulbs disposed in each of said compartments, a source of electric power, and means for selectively connecting said light bulbs in circuit with said source.

12. The apparatus of claim **1** wherein said cover means are transparent.

13. The apparatus of claim **1** wherein said cover means are translucent.

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