[54] DICE GAME OF CHANCE DEVICE

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[57] ABSTRACT

The device of this invention may be used in a dice game of chance normally requiring one or more dice, each showing from one to six spots on an upturned surface. The die portion of the present device is designed to display from one to six illuminated spots on an upturned surface which is supported on a base and rotated. When a die stops its rotating the number of spots illuminated will be a function of an angular position in relation to the base portion of the device. The base includes a mask and a light source, and the mask controls a passage of light to the light-admitting ends of an array of light guides which extend to the upturned surface. The device also includes means for stopping the rotating die at one of a predetermined number of possible angular positions.

4 Claims, 10 Drawing Figures
The invention relates to dice games of chance wherein a pair of dice will show from two to 12 spots on the uppermost surfaces, however, the more familiar cubes, which are rolled, are replaced in the present invention by cubes which are rotated. There are, of course, many replacements for the familiar cubes, but unlike prior art devices, the device of this invention contains features which permit it to be constructed and function in games of chance wherein any likely biases or prejudicial operating characteristics will have been reduced to a minimum.

SUMMARY OF THE INVENTION

The die and the base portion of the device described herein operate as a unit, the die being supported by and rotated in relation to the base. Between two opposing surfaces of a die, one being an upturned viewing surface, there is an array of at least seven individual light guides. At the viewing surface light-emitting ends of the guides are arranged so as to project from one to six illuminated spots, each presentation being in accordance with a predetermined angular position of the die in relation to the base. The opposing surface is supported adjacent a light-limiting mask in the base which controls the admission of light from a lamp, also in the base, to the array of light guides. Upon a rotating of the die, either clockwise or counterclockwise, the die will be allowed to stop at one of a predetermined number of positions, each position being related to a presentation of a predetermined number of illuminated spots on the viewing surface of the die. Magnetic control means are utilized to influence the stopping of, and the precise positioning of, the die.

Important features of the device are that it can be made to perform with a high degree of punctiliousness, and relatively inexpensively. These and other objects of the invention will best be understood from the following description when read in view of the drawings hereto.

BRIEF DESCRIPTION OF DRAWINGS

FIGS. 1, 2 and 3 show, respectively, top, side and bottom views of the device.

FIGS. 4 and 5 show the die and base, respectively, the die being separated from the base and the base shown in cross section;

FIG. 6 shows the upturned surface of the die;

FIG. 7 is a circuit detail of the positioning system;

FIGS. 8 and 9 are enlarged cross-sectional views, respectively, of the base and die of the device shown in Fig. 10 shows an embodiment detail of the invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to FIGS. 1, 2 and 3, the die portion 10 of the device 11 is mounted within a cavity 12 of a base portion 13, the die 10 being free to rotate with respect to the base 13 in either a counterclockwise or clockwise direction as indicated by the arrow 17 in FIG. 4. As shown in FIG. 4, the die 10 is supported from the base in FIG. 5, but when brought together as an operating unit 11 a bearing shaft 15 in the base portion 13 will fit into a suitable opening 16 in the die. The shaft 15 will be provided with ball bearings, for example, so as to assure a firm and low friction fit between the rotatable die, or first member 10, and the base, or second member 13, of the device.

The first and second surfaces 20 and 21, between which there exists a plurality of light guides 22. There will be at least seven light guides 22 having first ends 23 adjacent the first surface 20 and second ends adjacent the second surface 21. A mask 25 is included in the second member 13 which will be supported closely adjacent the first surface 20, and thereby intermediate the surface 20 and a light source 26. The latter may consist of a light bulb and battery supported within a housing 27 of the base 13, or, it may be supported independent of the base 13 and powered by other well known means.

Light emitting ends of the light guide means 22 are arranged as indicated in FIG. 6 to represent seven die spots a, b, c, d, etc. Two additional ends of light guides are also included in the array, but are blank spots and not intended to be useful other than to add uniformity to the array. The light-admitting ends of the light guide means 22 may be arranged as shown in FIG. 5, wherein the mask 25 is not shown. The mask 25 is shown in FIG. 8, which is a section through A—A of FIG. 2 to the extent of showing the construction of the base 13. FIG. 9 shows a section through A—A of the die portion 10 of FIG. 2.

In an enlarged view of the die cross section in FIG. 9 the light-admitting ends of the arrangement referred to in FIG. 3 are identified as a, b, c, d, e, f, g and, therefore, the first ends of the die spots shown in FIG. 6. With respect to the rotating center 30 of the die 10, the end a occupies a first radial position, ends b and c occupy a second radial position, ends d and e occupy a third radial position, and ends f and g occupy a fourth radial position. For the purpose of explaining the operation of the device, the first end array is shown in an angular position 1 and there are, for example, total of six different angular positions 1, 2, 3, 4, 5, 6, at which the array may be placed. These positions are again shown in FIG. 8, wherein they also relate to angular positions at which window appears in the mask 25. In the angular position 1 and in a first radial position a window will admit light from a source 26 to a light-admitting end a; in angular position 2 and second radial position two windows will admit light to ends b and c; in angular position 3 and from 1st and 2nd radial positions three windows will admit light to ends a, b and c; in angular position 4 and from 2nd and 3rd radial positions four windows will admit light to ends b and c; in angular position 5 and from first, second and third radial positions five windows will admit light to ends a, b, c and e; and in angular position 6 and from 2nd, 3rd and 4th radial positions six windows will admit light to ends b, c, e and d. Accordingly, light will be conducted to the upturned face of the die illuminating, respectively, one, two, three, four, five and six of the seven spots.

Adjacent the bottom surface 31 and an outer surface 32 of the die portion 10 there is a magnet 40, for example, two poles N and S, as indicated in FIG. 9. Referring now to the base portion 13 as shown in FIG. 5, there is a magnet 41, for each presenting N and S poles, at each of the angular positions 1 through 6. When the die portion 10 is being properly supported by the base portion 13 the magnet 40 will be allowed to cooperate with any of the magnets 41 through 46 located, respectively, at each of the angular positions 1 through 6. Therefore, when the die portion 10 in the FIG. 1 assembly is twisted by one's hand so as to rotate, either in a clockwise or counterclockwise direction, a number of complete revolutions the system of magnets will function as a means of stopping the rotation of the die, but, more importantly, upon stopping the die will have assumed a position coincident with one of the six angular positions 1 through 6. In doing so, the light admitting ends 23 could be aligned with any of the six window arrays in mask 25 and thereby effect the illumination of either one, two, three, four, five or six of the seven die spots at the viewing surface 21 of the die.

Each of the magnets 40 through 46 may be of alnico, ceramic, or the like, and each of those in the base 13 are equal in size, shape and magnetic force capabilities. Magnets 41 through 46 are also spaced equally, one from the other and radially. Depending upon the magnetic force capabilities of these magnets, as well as the various directions of the device 11, the gap between the magnet 40 and those in the base 13 may vary from a few thousandths of an inch to a few tenths of an inch. Utilizing airgaps of one-tenth inch I have found that the die could make from 10 to 20 revolutions before stopping.

The magnets in the base may be replaced by electromagnets. As shown in FIG. 7, wherein only two such magnets are illustrated, for example, electrical current from a source 50 will energize the coil 51 and a magnetic force thereof will be
The detail of the invention in FIG. 10 is to illustrate that the magnet 40 may be designed to cooperate with a system of magnets 55, similar to magnets 41 through 46, which are supported below the mask 25. A magnet 40 may then be embedded in one corner 56 of a die as indicated in FIG. 6. The die, having the shape of a cube, would be supported so as to be rotated slightly above the surface of the mask portion of a base. FIG. 10 also shows, for example, but one light guide 22 extending from a first surface 20 to an enlarged portion of the light guide means adjacent the second surface 21. The enlarged portion 58 is bonded to the guide 22 and is useful in the event the guide 22 diameter provides a second end cross section that is somewhat smaller than a desired spot size. The light guides 22 may be of a plastic material and are available in sizes from 0.010 to 0.050 inches in diameter.

Although a base portion of the invention has been illustrated and described herein as having but six angular die stopping positions and, therefore, six window arrays in the mask 25, the invention is not to be limited in this regard. The order in which the window arrays appear in the mask may be other than that illustrated. The device, therefore, has been illustrated and described in one or more of its most simplified forms.

The invention includes such other modifications and equivalents as may be seen by those skilled in the arts, particularly in regard to the arrangement of the first ends of the light guide means and the arrangement of the windows in the mask, but still within the scope of the appended claims.

I claim:

1. A device for utilization in a dice game of chance including:
   a. first and second members, said first member presenting first and second surfaces and having at least seven predetermined positioned individual light guide means supported therein, each presenting first and second ends, for conducting light from said first surface to said second surface, said first member supported adjacent said second member and rotatable in relation thereto;
   b. a light source;
   c. a mask having a plurality of predetermined positioned window means therethrough supported by said second member, intermediate said light source and said first surface, for allowing the passage of light from said source;
   d. said second surface being representative of an upturned face of a die and presenting at least seven die spots to which light will be conducted, selectively, through from one to six of said light guide means in accordance with said passage of light through said window means and said first ends of said light guide means dependent upon different respective angular positioning of the first member with respect to said second member;
   e. and first member angular position control means for allowing said first member to assume one of at least six different angular positions with respect to said second member and mask supported thereby upon rotation of said first member, each of said positions being related to a passing of light to said one, or more, of said first ends resulting, respectively, in a conducting of light to one, two, three, four, or five or six of said seven die spots depending upon which of the six angular positions is assumed.
   f. an axis common to said first and second members on which said rotating of the first member takes place;
   g. said angular position control means including a magnetic element supported by said first member a predetermined distance off said axis;
   h. at least six magnets, each supported by said second member a predetermined distance off said axis coincident with one of said angular positions for effecting said positioning of the first member.

2. A device for utilization in a dice game of chance including:
   a. a rotatable member;
   b. a light source;
   c. a mask intermediate said light source and a first surface of said member;
   d. said member being rotatable in relation to said mask about an axis thereof which coincides with a center point of said mask;
   e. a plurality of light guide means, each presenting first and second ends, extending from said first ends which are angularly spaced in predetermined off axis positions of said area of said first surface to a die spot display surface of said member, said second ends arranged adjacent said display surface so as to represent seven die spots;
   f. said mask including at least six window arrangements, each containing, respectively, one, two, three, four, five and six windows, occupying at least six angularly spaced off axis positions for effecting a passing of light to a predetermined one or more of said first ends from said positions dependent upon the angular position of said rotatable member with respect to said mask;
   g. angular position control means for allowing said rotatable member to assume any of at least six different angular positions with respect to said mask upon a rotating thereof, each of said positions being related to a passing of light through said window arrangements to said one or more first ends and, respectively, to a conducting of light to one, two, three, four, or five of said seven die spots.

3. The invention as set forth in claim 1 additionally including:
   a. a first magnetic element supported by said rotatable member off said axis and adjacent said first surface;
   i. at least six magnetic elements associated with said mask supported off said axis and coincident, respectively, with said six windows arrangements and cooperating with said first magnetic element in effecting a positioning of said rotatable member in one of said six different angular positions.

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