United States Patent [19]

McNaney

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[54] **LIGHT SPOT PATTERN FORMATION AND COLOR CONTROL DISPLAY APPARATUS**

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[52] **U.S. Cl.** **40/34;** 40/106.52

[51] **Int. Cl.** **G09f 13/36**

[58] **Field of Search** ..... 40/130 R, 132 R, 132 E, 40/132 F, 132 G, 34, 106.51–106.53, 70 R

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Assistant Examiner—John F. Pitrelli

[57] **ABSTRACT**

The apparatus of this invention is designed to display information comprised of any one of a number of predetermined light spot pattern formation in any one of a number of predetermined colors. One example of its usefulness is set forth herein as a display means representative of an upturned face of a die for use in games of chance requiring not only a showing of one or more spots, but in addition showing the spots in different colors.

1 Claim, 7 Drawing Figures

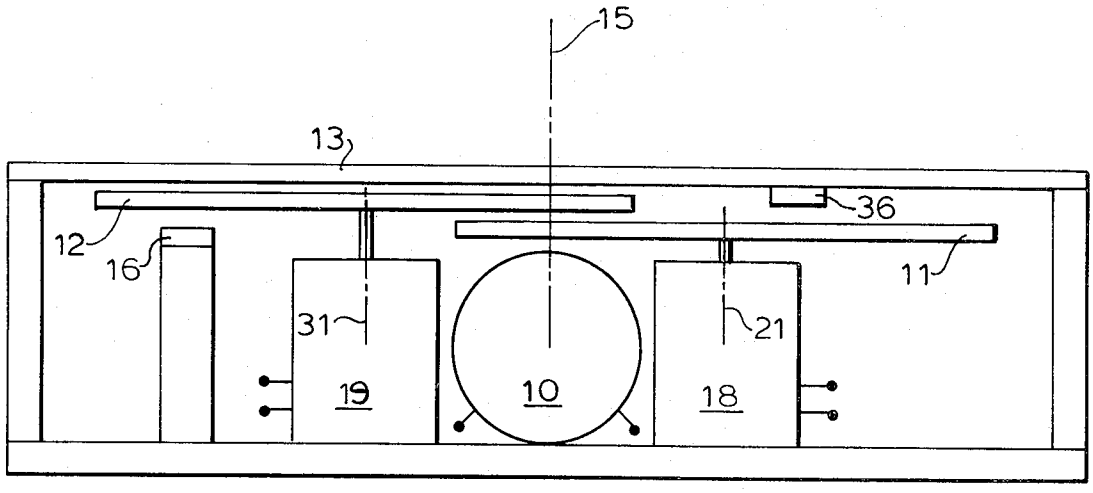
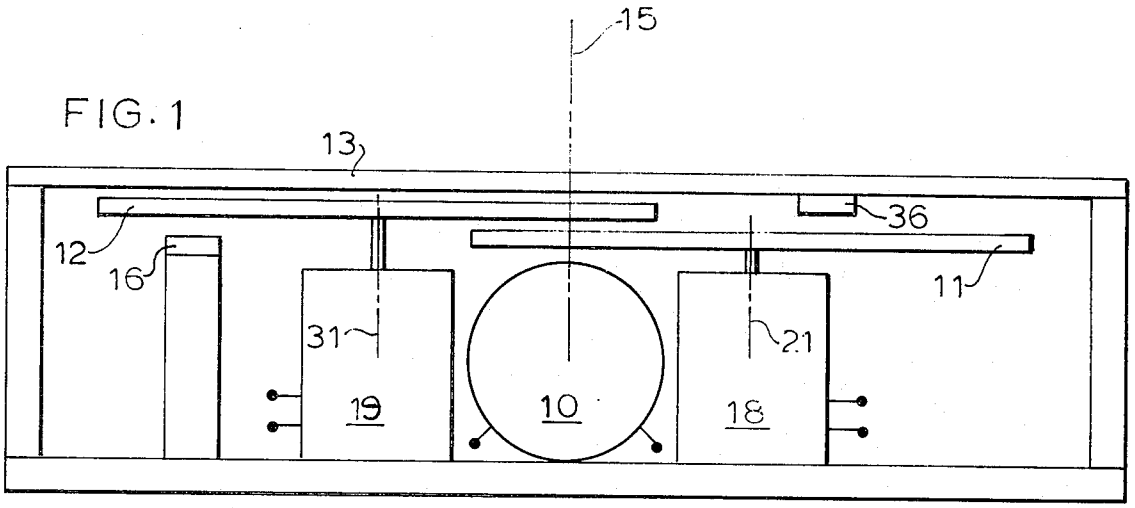


FIG. 1



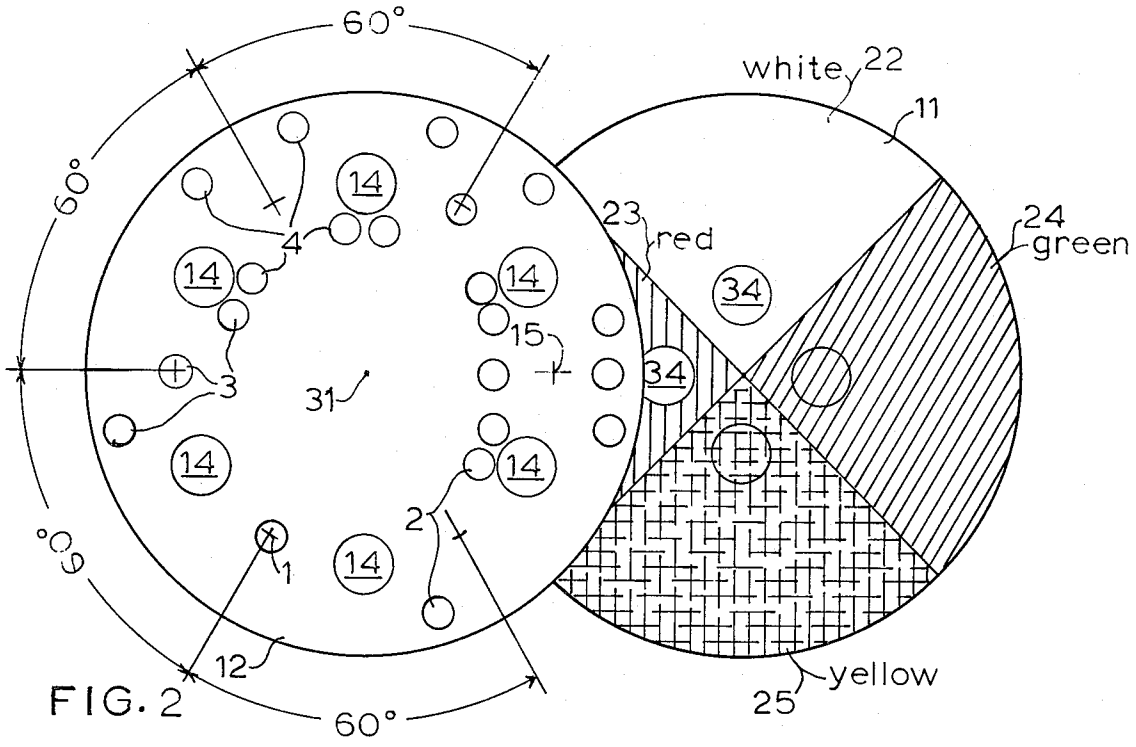


FIG. 2

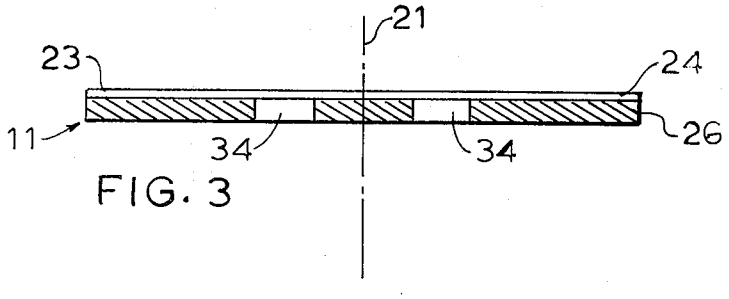


FIG. 3

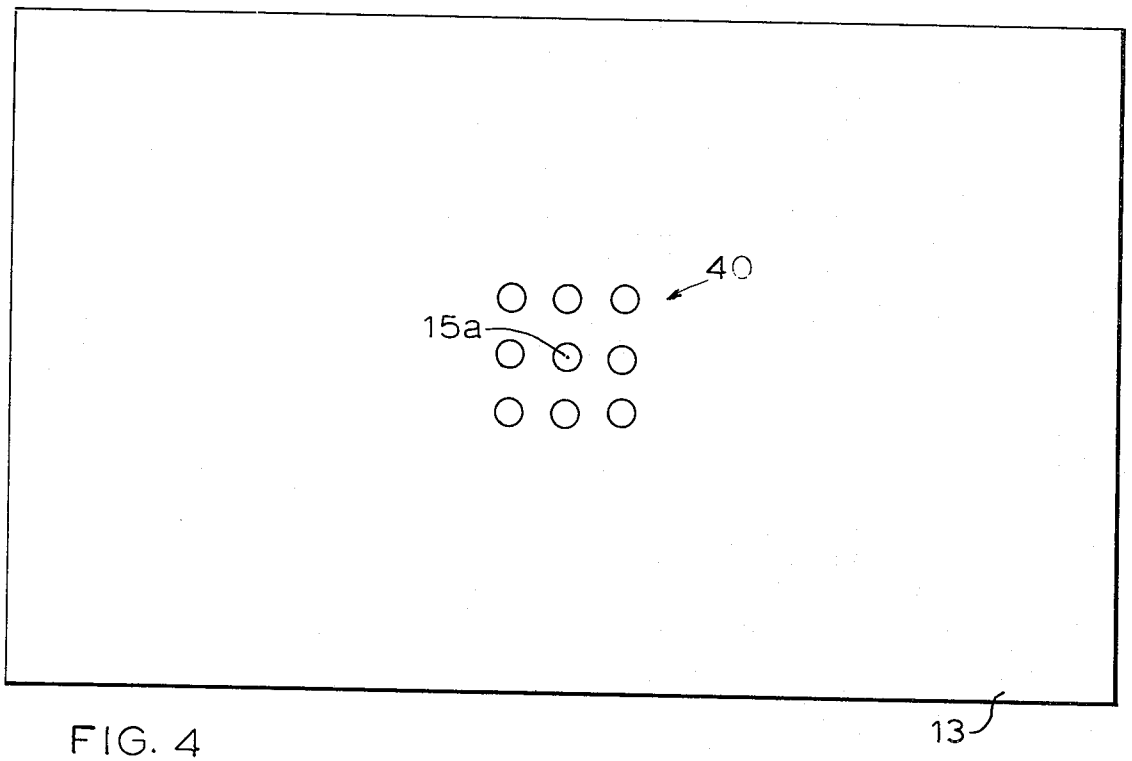


FIG. 4

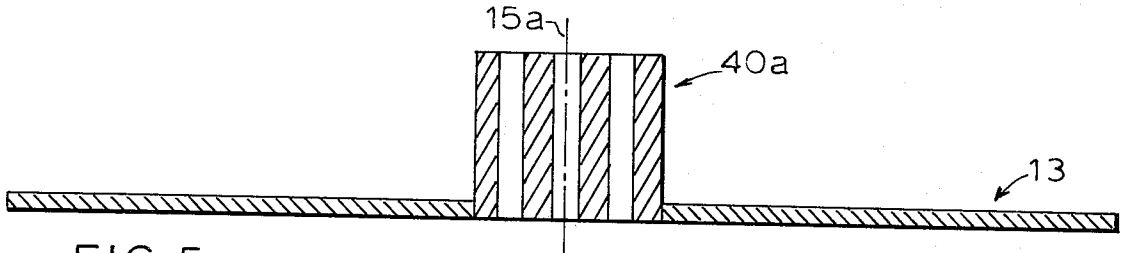


FIG. 5

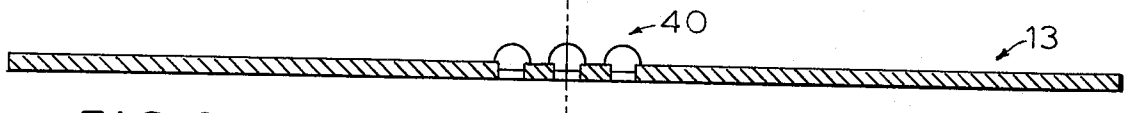


FIG. 6

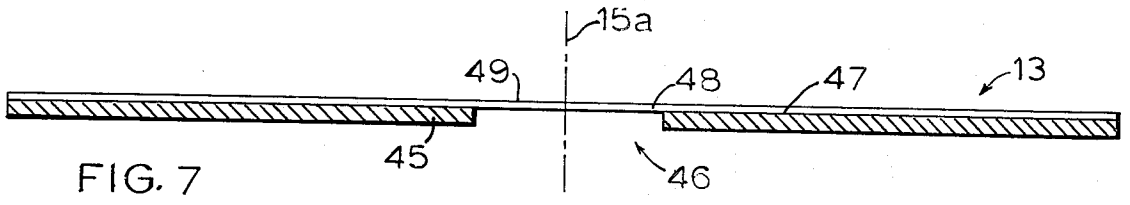


FIG. 7

LIGHT SPOT PATTERN FORMATION AND COLOR CONTROL DISPLAY APPARATUS

SUMMARY OF THE INVENTION

The apparatus hereof utilizes first, second and third light passage control members, in combination with a source of light, to perform the functions of pattern control, color control and display. In the light spot display embodiment of the invention one of the members is rotatable about an axis thereof and designed to effect a passage of light to the display surface of the third member representative of die spots. Indexing means thereof will permit the showing of from one to six arrays of light spots. Another of the members is designed to effect light attenuating or filtering functions. This member is also rotatable about an axis thereof and indexing means associated therewith will permit an array of light spots to be displayed in any one of several different colors, such as white, red, green or yellow.

An object of the invention is to effect displays of a predetermined number of different patterns comprised of light spots and multiply the usefulness of the patterns available by the number of different colors in which the patterns can be displayed. These and other features and objects will best be understood from the following description when read in connection with the drawings hereof.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 includes a showing of an assembly of the various parts of the invention;

FIG. 2 is another view of the pattern and color control members;

FIG. 3 shows other details of the light filter member;

FIG. 4 is a surface view of the display member included in the assembly of FIG. 1;

FIG. 5 shows a variation from the display means of FIG. 4;

FIG. 6 shows a modification of the display means of FIG. 5;

FIG. 7 shows a further variation of the display means.

DETAILED DESCRIPTION

The assembly of the various parts of FIG. 1 includes a light source 10, and first, second and third light passage control members, 11, 12 and 13, respectively. The first member 11 is supported rotatably about an axis 21 thereof. The second member 12 is supported rotatably about an axis 31 thereof. And the first and second members have light passage control window areas therein selectively positionable between the light source 10 and a fixed position light passage control window area of the third member 13. There is, therefore, a line 15 along and about which the selectively positioned window areas of the first and second members, the source of light and the window area of the third member 13 are established.

The additional view of the second member 12 in FIG. 2 shows window means therein each designed to form light spots in pattern formations representing, respectively, die spots one, two, three, four, five and six, each angularly spaced one with respect to the other 60°, and a radial point about which each pattern is positioned is the same for each pattern. Upon rotation of the second member 12 by, for example, a momentary energization of electrical motor means 19 indexing means, such as magnets 14 being supported by member 12 and a reference magnet 16 fixedly supported in relation thereto as shown in FIG. 1, will influence the stoppage of the member 12 and thereupon permit different ones of the pattern formations to assume a reference position along line 15. In FIG. 2 the array of six light spots is shown in this position.

The color control member 11 is shown to have, for example, means for deriving four different colors from the light source 10, such as white, red, green or yellow. The light filtering materials 22, 23, 24 and 25, as indicated in FIG. 3, can be supported on a light transparent base material 26, each occupying a fourth of the base 26 surface. Upon rotation of the first member 11 by, for example, a momentary energization of electrical motor means 18 indexing means, such as magnets 34 being supported by the member 11 and a reference magnet 36 fixedly supported in relation thereto as shown in FIG. 1, will influence the stoppage of the member 11 and thereupon permit different ones of the four light filters to assume a reference position along line 15.

The additional view of the third member 13 in FIG. 4 shows the window means 40 therein to be comprised of nine holes therethrough. A reference point 15*a* about which this array of holes is positioned in the member 13 coincides with a similar point along the line 15 in the FIG. 1 assembly. From one to six of the nine holes will receive light from the source 10, depending upon the indexing of the second member 12 in relation to the line 15. The color or hue of the light from the source 10 will depend upon the indexing of the first member 11 in relation to the line 15.

FIG. 5 shows a variation of the display means of FIG. 4 to the extent of increasing the length dimension of the nine-hole window means 40*a*. The nine holes may, of course, be filled with a light guide material, such as plastic. But in view of their length to diameter dimensions, and when made of aluminum for example, the light reflecting walls thereof perform very well. FIG. 6 shows the display means 40 wherein each hole is capped with a plastic lens.

In FIG. 7 the third member 13 of the FIG. 1 assembly is shown to include an opaque support material 45 having a single opening 46 therein. A reference point 15*a*, and center point of the hole 46, coincides with a similar point along the line 15 in the FIG. 1 assembly. The opening 46, and preferably the entire surface 47 as well, is covered with a layer of a translucent material whereby a projection of light spots being derived from the light source 10 through the window means of the first and second members, 11 and 12, will be displayed on the surface 49 of the translucent material 48.

Various means can be used to effect a rotation of the control members 11 and 12, and electrical motor means 18 and 19, respectively, are illustrated in FIG. 1 as being one such means. It will of course be understood by those skilled in the arts that the first and second members, 11 and 12, can be rotatably and concentrically supported about a common axle means. Although the second light passage control member 12 is illustrated as having but six arrays of window means from which patterns are formed on a display surface, the invention, of course, can be made more useful by designing therein more than but six arrays of window means. And also, the particularly illustrated round openings in the window means of the member 12 may provide more meaningful patterns for display when

such openings or light transparent areas are given square or oblong shapes, for example.

It should understood by those skilled in the arts pertaining to the construction and application possibilities of the invention set forth herein that the embodiments included herein illustrate in a very limited sense the usefulness of the invention and that the invention includes such other modificatons and equivalents as may be seen by those skilled in the arts, but still being within the scope of the appended claims.

I claim:

1. Light spot pattern formation and color control apparatus comprising:

a. a light source;

b. first, second and third light passage control members;

c. axle means supporting said first and second members, respectively, for rotation thereof one with respect to the other and each with respect to said third member and to said light source, said first and second members being intermediate said third member and said light source;

d. indexing means for indexing said first and second members, respectively, in any one of a plurality of index positions with respect to said third member upon rotation thereof;

e. said first member having a plurality of light attenuating means each controlling the color of light upon passing therethrough from said light source;

f. said second member having a plurality of predetermined positioned window means therethrough each controlling the pattern of light upon passing therethrough from said light source;

g. said third member presenting a display surface and having window means therethrough to said surface;

h. said indexing means effecting an optical alignment of an individual one of said light attenuating means of said first member, an individual one of said window means of said second member, and said window means of said third member, whereby the different hue and pattern of light spot formations presented at the display surface of said third member is dependent upon the indexing of said first and second members with respect to said third member, the indexing means of said first member including predetermined arrangement of magnetic material means supported thereby and reference magnetic element means fixedly supported in relation thereto for magnetically influencing the stoppage of said first member and thereupon effecting the optical alignment of one of said attenuating means with the window means of said third member, and the indexing means of said second member including predetermined arrangement of magnetic material means supported thereby and reference magnetic element means fixedly supported in relation thereto for magnetically influencing the stoppage of said second member and thereupon effecting the optical alignment of one of said window means thereof with the window means of said third member.

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