GAME APPARATUS ILLUSTRATING AN OPTICAL ILLUSION

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9 Claims

ABSTRACT OF THE DISCLOSURE

Game pieces for illustrating an optical illusion created by the relative sizes of concentric edges including two similarly shaped pieces, the first of which has a significantly greater outer peripheral extent than the second. Each of these pieces has a concentric opening of the same configuration as the periphery, the opening of the first piece being slightly greater than that of the second. A third gauge member of similar configuration sized to fit into the opening in the first piece but not in that of the second piece is used as a gauge member to verify that the opening in the first piece is larger than the opening in the second piece.

This invention relates to a game device, and concerns more particularly, a game device which will be amusing as well as instructive to young children, and yet will also be suitable for amusement of older children as well as adults.

The principal object of the invention is to provide a game device so constructed as to enable amusement as well as instructional value to be obtained by the users thereof, as a result of an optical illusion.

In accordance with the invention, the optical illusion pertains to the relative dimensions of certain of the parts of the device. This illusion is created, in accordance with the invention, by configuring and dimensioning certain of the parts of the device in the manner hereinafter more particularly set forth.

The objects and advantages of the invention will be more readily apparent from the detailed description herebelow and from the accompanying drawing, in which:

FIG. 1 is an exploded view, in plan, illustrating a preferred embodiment of the invention, drawn in substantially full-size scale;

FIG. 2 is a plan view illustrating several of the parts of the device of FIG. 1 in their assembled relation;

FIG. 3 is an enlarged cross-sectional view, taken along line 3--3 of FIG. 2;

FIG. 4 is a plan view of one of the parts shown in FIG. 2 in an assembled relation to another part of the device;

FIG. 5 is an enlarged cross-sectional view, taken along line 5--5 of FIG. 4; and

FIG. 6 is a fragmentary view, partly in elevation and partly in cross-section, showing in magnified form, a portion of one of the parts of the device shown in FIGS. 1, 4 and 5;

FIGS. 7, 8 and 9 are each a view similar to FIG. 1, but each illustrating a different embodiment of the invention.

Stated generally, the game device of the invention comprises a set of three circular discs, each of which is of the same geometric form or configuration but differently dimensioned. Two of the discs are of substantially different outside dimensions and each has a central opening or bore, these openings or bores being each of the same geometric form or configuration as is the periphery of the discs composing the set, but of slightly different dimensions, all as will hereinafter be more fully explained.

In accordance with the invention, each of the discs 10 and 30 each has a centrally disposed opening or bore, the bore 13 of disc 10 being of slightly larger diameter than that of the bore 33 of disc 30, and the annular rim 14 of disc 10 being of a substantially greater radial dimension than is the annular rim 35 of disc 30. As will be seen from FIGS. 1, 2 and 4, the overall or outside diameter of disc 10, i.e., the diameter of the peripheral edge 11 of disc 10, is substantially greater than the overall or outside diameter of disc 30, viz., the diameter of its peripheral edge 34.

Although I am not certain as to the physiological optics or psychology which may explain the same, I have found that the discs 10 and 30, when placed sufficiently close to one another to be observed simultaneously, impart to the observer the optical illusion that the bore 33 of disc 30 is larger than the bore 13 of disc 10. As will be seen from the above description of these two discs, the reverse is, in fact, the case.

In terms of actual measurements, the aforesaid optical illusion prevails when the diameter of bore 13 of the larger disc 10 exceeds the diameter of bore 33 of the smaller disc 30 by an amount which may range between 0.001 and 0.005 of an inch. The disc 10 may have an outside diameter of the order of 2 inches and a central bore 13 of, say, 0.875 inch diameter, and the disc 30 may have an outside diameter of the order of 1 1/2 inches, and a central bore 33 whose diameter is 0.870 to 0.875 inch.

Without intending to be limited thereby, it appears that the above-described optical illusion created by the discs 10 and 30 is attributable primarily to the fact that with only the slight difference between the diameters of openings 13 and 33, the substantially smaller radial dimension of rim 35 than the radial dimension of the rim 14 of the larger disc 10, gives to the eye of the observer the impression that opening 33 is larger than the bore 13.

The game device of the invention desirably comprises, in addition to the two discs constructed to create the optical illusion above described, a third disc. The latter is indicated by reference numeral 20. The outside diameter of disc 20 is slightly less than the diameter of bore 13 in disc 10, but slightly larger than the diameter of bore 33.

The disc 20 may be utilized in conjunction with discs 10 and 30 to confirm to an observer that his impression of opening 33 in disc 30 as being larger than opening 13 in disc 10, is an optical illusion. That is to say, by placing the disc 20 in the center bore 13 of disc 10 it will readily clear the bore by reason of the slight difference between the outside diameter of disc 20 and the diameter of bore 13. On the other hand, the outside diameter of disc 20, being slightly greater than the diameter of bore 33 in disc 30, will not clear the bore 33 when placed therein.

The clearance of the bore 13 by disc 20 is illustrated in FIGS. 2 and 3, whereas its non-clearance of bore 33 in disc 30 is illustrated in FIG. 4. If desired, the disc 20 may also be of annular form, i.e., it may have a central opening 23, to provide it with a rim 24 between the edge 22 of the opening and the peripheral edge 21 of the disc.

In the drawings, the peripheral edge 14 of the smaller disc 30 is illustrated as being formed with a slight bevel or curvature 34 adjacent one face, such as the face 35, of the disc, i.e., adjacent one end of the surface 32 of the bore 33. This bevelled formation serves to accentuate the above-described optical illusion, and is accordingly utilized in the preferred embodiment of the invention.

The cross-sectional thickness of the discs 10 and 30 may
3 desirably be of the order of sectional thickness of the disc 20, although shown in FIGS. 3 and 5 as being substantially the same as that of discs 10 and 30, may be greater or less than that of the latter discs.

Although the discs are indicated in the drawing as being made of metal, it will be apparent that they may be made of other suitable material. Among such other materials are so-called hardboard of the type known as "Masonite", colored glass, thermoplastic synthetic resins such as high-density polyethylene, polypropylene, polystyrene, methyl methacrylate, nylon, polycarbonate, acrylonitrile-buta- diene-styrene copolymers, vinyl copolymers, and the like; as well as thermosetting resins such as melamine-formaldehyde, urea-formaldehyde, polystyrene, epoxies, and the like.

In the use of the game device of the invention, the user would normally proceed by placing discs 10 and 30 on a flat surface (such as a table top) in somewhat spaced relation to one another, say several inches apart, and then eliciting from another person his answer to the query as to which of the two discs has the larger opening. By reason of the optical illusion above described, the other person will in all instances (if he answers on the basis of the optical impression he receives by his observation of the discs 10 and 30 placed as above set forth) answer that the disc 30 is the one having the larger opening. Thereupon, the user may demonstrate that in fact it is disc 10 which has the larger opening. This may readily be done by successively placing (in either order) disc 20 over opening 13 in disc 10, whereas it will not pass through opening 33 in disc 30.

Although in the preferred embodiment of the invention illustrated in the drawing and described hereinabove, the discs are of circular outline or configuration, the same optical illusion may be achieved with discs of other geometric outline or configuration, so long as the set comprises two discs (corresponding to discs 10 and 30, supra) whose peripheries are of the same geometric configuration but of substantially different outside dimensions, and each is formed with a central opening whose peripheries is of the same geometric configuration but dimensioned to provide a substantially wider rim on the larger disc than that of the smaller disc, and with the opening in the larger disc dimensioned slightly (several thousandths of an inch) in excess of the dimension of the opening in the smaller one of the two discs of the set.

Thus, for example, the invention may be embodied in discs of oval or of rectangular, triangular, or other polygonal configuration, including configurations which are of irregular as well as those which are of regular geometric outline.

FIG. 7 illustrates an embodiment of the invention wherein the larger disc 40 (corresponding to disc 10 of the preferred embodiment) and the smaller disc 50 (corresponding to disc 30 of the preferred embodiment) are each of oval configuration, and are each formed with a central opening, as shown at 43, 53, respectively, of the same oval configuration, but with the opening in disc 43 of slightly larger dimension than that in disc 53. An embodiment utilizing discs 60, 70 and openings 63, 73 of triangular configuration is shown in FIG. 8; and an embodiment wherein the corresponding discs 80, 90 and openings 83, 93 are of rectangular configuration is illustrated in FIG. 9.

If desired, for the purposes of further enhancing the interest of the game to the users thereof, or for other desired reasons, a plurality of sets of discs constructed as above-described, the discs of one set being of different geometric configuration than that of the discs of one or several other sets, may be collated into a group for sale as a single package.

What is claimed is:

1. A game or like device, comprising a set of rigid discs, at least two of the discs composing the set having the same geometric configuration, a first one of said two discs having its outer periphery of substantially greater dimension than the outer periphery of the other of said two discs, each of said two discs having a centrally disposed opening therein, each of said openings having a configuration which is the same as said first-named configuration, the opening in said first one of said two discs being of designedly slightly larger dimension that that in the second one of said two discs, whereby to provide a rim of substantially greater width on said first one of said two discs than that on said second one of said two discs, the difference in width of the respective rims of said discs being sufficient to create an optical illusion of a larger central opening in said second one of said two discs than in said first one of said two discs, a third disc of said set being dimensioned at its periphery to enable the same to pass through said opening in the said first one of said two discs, each of said two discs but not through the opening in said second one of said two discs.

2. A game device as defined in claim 1 wherein said third disc of said set of discs is formed with a central opening.

3. A game device as defined in claim 1 wherein each of said discs is formed of metal.

4. A game device as defined in claim 1 wherein each of said discs is formed of synthetic plastic material.

5. A game device as defined in claim 1 wherein the periphery of the central bore in the second of said two discs is formed with a slight bevel at one face thereof.

6. A game device as defined in claim 1, wherein each of said discs and the opening formed in each of said two discs are of circular configuration.

7. A game device as defined in claim 1, wherein each of said discs and the opening formed in each of said two discs are of triangular configuration.

8. A game device as defined in claim 1, wherein each of said discs and the opening formed in each of said two discs are of oval configuration.

9. A game device as defined in claim 1, wherein each of said discs and the opening formed in each of said two discs are of rectangular configuration.

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