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(54) **OPTICAL TOE LINE FOR DART GAMES**

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(57) **ABSTRACT**

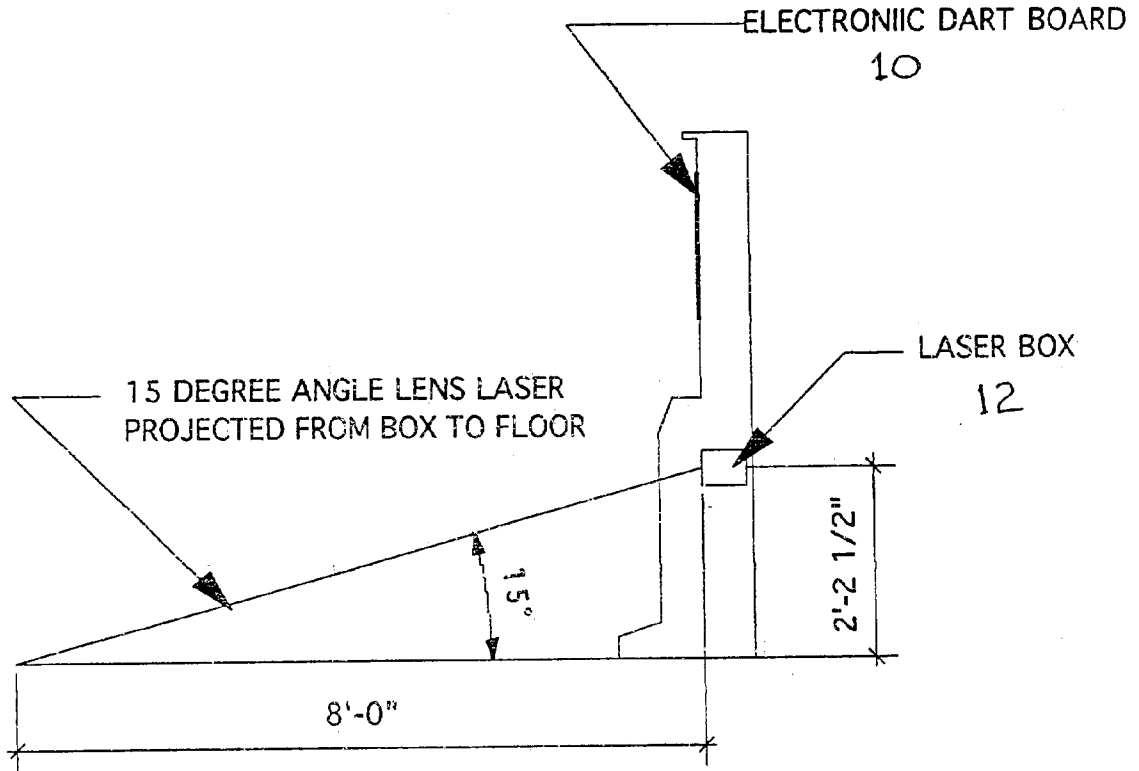
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Related U.S. Application Data

(60) Provisional application No. 60/338,183, filed on Dec. 6, 2001.

Disclosed is a dart game wherein the distance from which the darts are to be thrown toward the board is marked optically, using a visible-light generating device, such as a lamp, light-emitting diode, or laser. The game includes a dart board in combination with means for generating and projecting a visible toe line onto a floor in front of the dart board at a pre-set or user-adjustable distance from the front face of the dart board, the means preferably being the previously noted lamp, light-emitting diode, or laser.



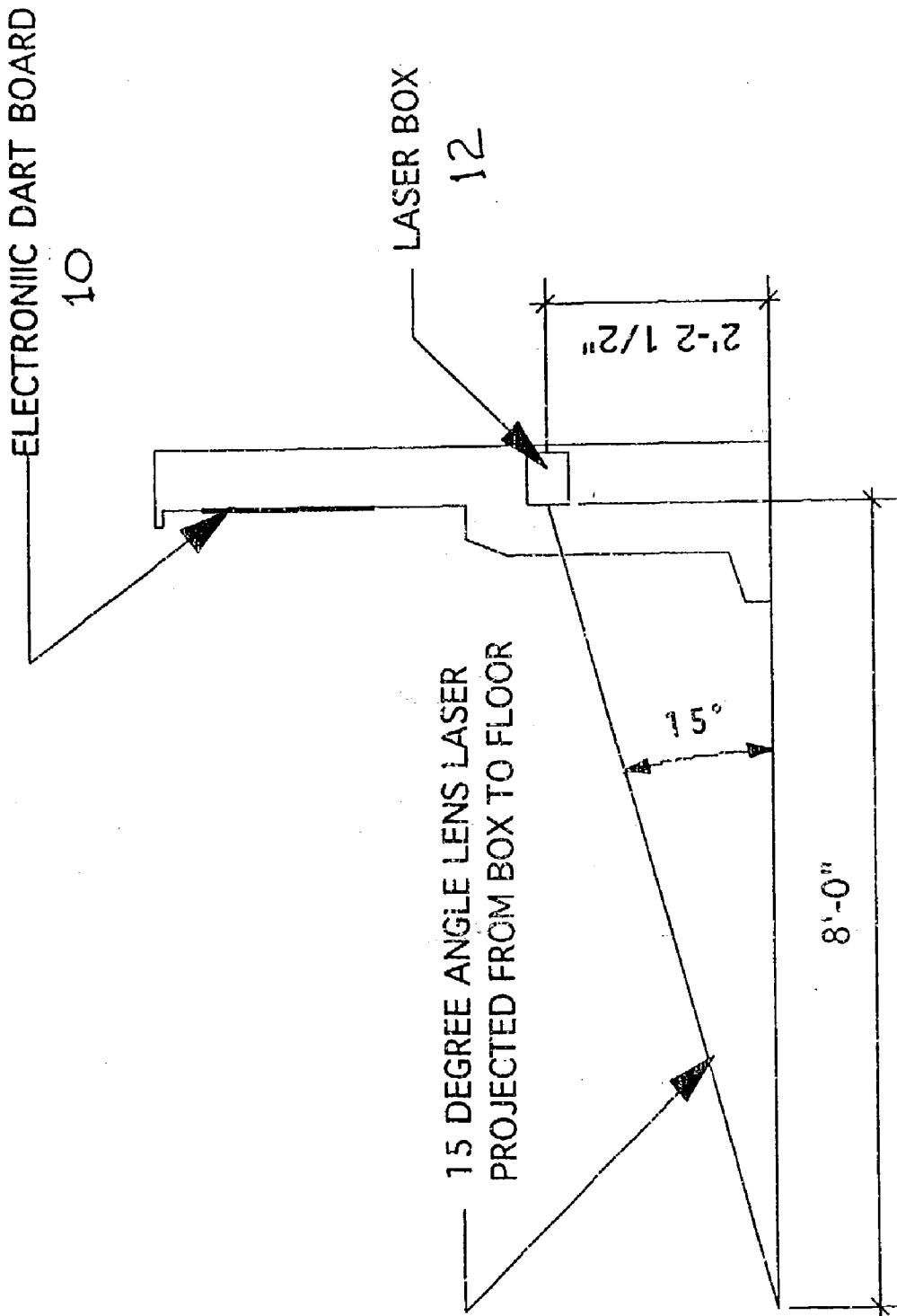


FIG. 1

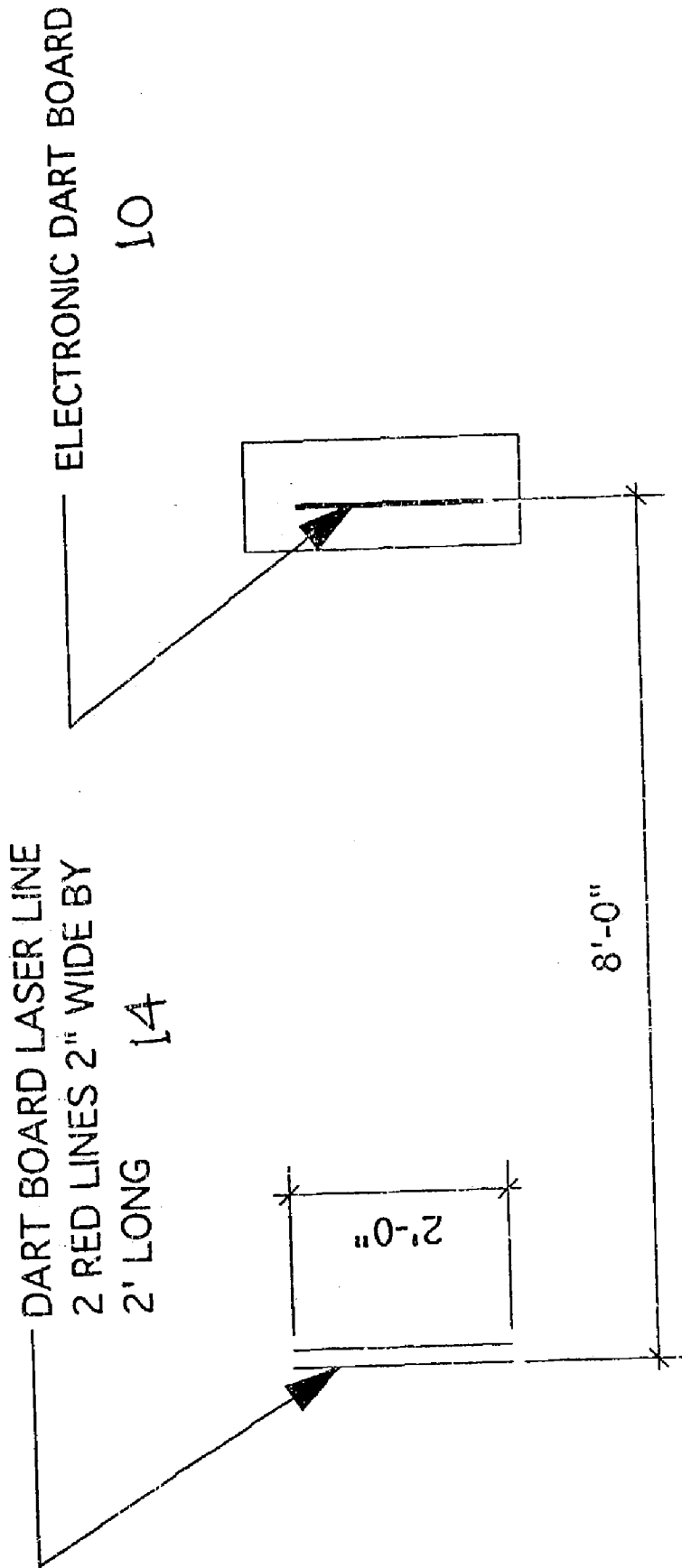


FIG. 2

OPTICAL TOE LINE FOR DART GAMES

RELATED APPLICATION

[0001] Priority is hereby claimed to provisional patent application Ser. No. 60/338,183, filed Dec. 6, 2001, and incorporated herein.

FIELD OF THE INVENTION

[0002] The invention is directed to a dart board that includes a means for generating and projecting a toe line onto the floor at a factory pre-set or user-adjustable distance from the face of the dart board.

BACKGROUND

[0003] Darts is a well known and widely played barroom game in the United States, the United Kingdom, and throughout the world. In most official versions of the game, the center of the bull's eye (or "cork") is positioned 173 cm (5 feet, 8 inches) from the floor and the throwing distance, that is, the position of the toe line, is 2.37 meters (7 feet, 9¼ inches) from the face of the dart board.

[0004] Conventionally, in both casual play and in tournament play, the toe line is marked on the floor using adhesive tape, paint, or inset tiles that contrast in color from the surrounding floor material. This gives the players a clear indication of where they are to stand when addressing the dart board. Each approach, however, suffers from distinct drawbacks.

[0005] Tape, the easiest and perhaps most widely employed means of marking the toe line, cannot be used reliably on carpeted floors. While the tape may stick for several rounds, eventually it no longer sticks to the nap of the carpet and must be replaced. On tile floors, tape works much better, but still must be replaced as it is worn from the floor over time. Moreover, each time the dart board is relocated, the toe line, likewise, must also be relocated.

[0006] Marking the toe line using inset tiles, while permanent, is also immovable. Thus, once the line is demarcated, while the dart board can be relocated with relative ease, the toe line cannot.

[0007] The mere presence of a toe line can also cause aesthetic flaws when the space where darts is played is also used for other purposes, as in a recreation room or barroom. Where the space is used for a number of various purposes, it might be necessary to set and remove the toe line repeatedly, as the use of the room changes.

[0008] Whatever the conventional means chosen to mark the toe line, an accurate measurement must be made from the face of the dart board to the required horizontal distance (as noted above, for most countries this distance is 7 feet, 9¼ inches, although the distance is often lengthened to 8 feet even in the United States). While certainly not a terribly difficult task, it does require a plumb bob and a tape measure, and greatly slows the process of relocating a dart board.

[0009] The present invention addresses these needs by providing (in the preferred embodiment), in combination, a dart board, and a means to generate and project a toe line onto the floor at a factory pre-set or user-adjustable distance from the face of the dart board.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a right side elevation schematic of a dart board with a light-emitting diode- or laser-generated toe line.

[0011] FIG. 2 is a top view schematic of a dart board with a light-emitting diode- or laser-generated toe line.

DETAILED DESCRIPTION OF THE INVENTION

[0012] As depicted in FIGS. 1 and 2, the invention is a dart board in combination with a means for generating and projecting a user-visible toe line onto the floor in front of the dart board at a factory pre-set or user-definable distance from the front plane of the dart board. The nature of the dart board itself is not critical to the function of the invention. Thus, the dart board itself may be a conventional 20-section board, a modified dart board, or any other type of dart board. The dart board may be made of any material, including conventional dart boards of any design or material (bristle, etc.) and electronic dart boards of any design.

[0013] Referring now to FIGS. 1 and 2, depicted in the figures is a dart board 10, a "laser box" 12, and a "laser line" 14. As noted above, the dart board 10, can be any type of dart board, without limitation.

[0014] The crux of the invention is the "laser box" 12, which is a means for generating and projecting an easily-seen, visible line onto the floor in front of the dart board, at a pre-set or user-definable distance from the front plane of the dart board. The means for generating and projecting the visible line can be any means now known or developed in the future for accomplishing this task. Specifically, the means within the laser box 12 for generating and projecting the visible line onto the floor in front of the dart board 10 can be a lamp that generates visible light, the lamp operationally coupled with one or more lenses and/or opaque masks to direct and focus the image of a line onto the floor. The lamp functions to generate light within the visible spectrum and the lenses and/or masks direct and focus the light onto the floor in the shape of a well-defined line having distinct edges easily discerned by the art player. The line falls on the floor at the desired distance from the face of the dart board.

[0015] The means may also be a light-emitting diode (LED) that emits light in the visible range. Here, the LED may also optionally coupled with one or more lenses or masks to direct and focus a line onto the floor at a desired distance from the face of the dart board.

[0016] The preferred means to generate and project a visible line onto the floor in front of the dart board is a laser that generates light within the visible spectrum of light. As with the other means, the laser light source may be coupled with lenses and/or masks to direct and focus a visible line onto the floor.

[0017] Such lamps, LED's, and lasers (i.e. light sources that generate light in the visible spectrum) are available from many different commercial sources. For example, lasers suitable for use in the present invention can be obtained from World Star Technologies Inc., Toronto, Ontario. These lasers generate light output in various wavelengths, ranging from 635 nm to 830 nm, at net power outputs ranging from 3.5 to 50 mW. The operational voltage input is 5 V dc, and the

operational current is less than 120 mA. The beam diameter can be focused and is adjustable to within 0.20 mm at roughly 8 feet. The fan angle of the emitted beam is factory preset to 15, 30, 45, 60 and 90 degrees. The beam is focused using a combination of aspherical and cylindrical glass lenses.

[0018] In operation, the laser box 12 is either incorporated into an electronic dart board apparatus, as shown in FIG. 1, or is incorporated directly into the outer rim of the dart board, in the case a conventional, bristle dart board (not shown in figures). The laser box 12, and thus the means to generate and project a visible line onto the floor, are positioned, in one embodiment, at a fixed position from the floor and at a fixed angle to the floor, thereby to direct and focus a visible line onto the floor at a preset distance from the front plane of the dart board (8 feet as shown in the figures).

[0019] In a second embodiment, the height of the laser box from the floor and the angle of the means to generate and project a visible line onto the floor are both adjustable so that the user may adjust the position of the laser box relative to the dart board and the distance of the line generated by the dart board (reference number 14 in FIG. 2) can be adjusted by the user.

[0020] There are many benefits and advantages to the invention. First, it allows a toe line to be set accurately, without modifying the floor in any fashion. Second, when the dart board is moved, the toe line is literally moved with it. Thus, the dart board can be set up in any location where there is sufficient space and play can begin immediately. Third, the toe line does not require any maintenance and can accurately be cast on any flooring surface (tile, wood, carpet, etc.) without damage to the floor.

[0021] In another embodiment of the invention, the line generated by the laser box may also include dynamic alpha-numeric information about the players, the game being played, the score, etc. In this embodiment, the laser box further includes means for acquiring, storing, and manipulating information about the players' names, various types of dart games and how they are played and scored, and means for generating a dynamic output of such information and casting an image of the same on the floor in front of the dart board.

[0022] The means for acquiring, storing, and manipulating information about the players' names, the rules of dart games, and how the games are scored is preferably a programmable computer or microprocessor. The microprocessor can be "hard-wired" to process the rules of particular games (i.e. the microprocessor is programmed at the factory and is not adjustable by the end-user), or the microprocessor may be adapted and configured to be programmed by the user. The microprocessor is also programmed to keep track of the various players, whose turn it is, what the scores are, etc. The means should also include an input source to enter players names and the game desired to be played. Such means is preferably a standard alpha-numeric keyboard or pad having alpha-numeric keys for entering the required information.

[0023] The means for generating a dynamic output of players' names, scoring information, whose turn it is, etc. and casting an image of the same on the floor in front of the dart board, is preferably an LED or LCD projector that

generates the image on a screen and projects it onto the floor in front of the dart board. Such LED and LCD screens (color or black & white) are well known in the art and are widely used in such devices as laptop computers, cell phone display panels, etc.

[0024] For example, in operation, the laser box would generate not only a toe line, but also a player's name, and his score, and cast the image of the same onto the floor. When that first player's turn was complete, the laser box 12 would then generate an image of the next player's name and his score, etc. In this fashion, the games can be played in orderly fashion, with the score being tabulated automatically and dynamically projected onto the floor in front of the dart board.

[0025] In another embodiment, the laser box would also include a feedback loop to sound an alarm when a player's foot was beyond the toe line (and thus too close to the dart board). In this embodiment, the laser box would include a feedback loop that indicates when the laser line is broken. Thus, a player can step up to the line, and toe the line. So long as the player's toe does not break the line, play continues. However, if the player sets himself up too close to the dart board, and his toe crosses the toe line, the laser box will generate a tone indicating that the player is illegally too close to the dart board.

What is claimed:

1. A game comprising: a dart board having a front face in combination with a means for generating and projecting a visible toe line onto a floor in front of the dart board at a pre-set or user-adjustable distance from the front face of the dart board.

2. The game of claim 1, wherein the means for generating and projecting a toe line comprises a lamp generating light in the visible spectrum.

3. The game of claim 1, wherein the means for generating and projecting a toe line comprises a light-emitting diode generating light in the visible spectrum.

4. The game of claim 1, wherein the means for generating and projecting a toe line comprises a laser generating light in the visible spectrum.

5. A game comprising: a dart board having a front face in combination with a means for generating and projecting a toe line onto a floor in front of the dart board at a pre-set or user-adjustable distance from the front face of the dart board, wherein the means for generating and projecting the toe line comprises a means selected from the group consisting of a lamp generating light in the visible spectrum, a light-emitting diode generating light in the visible spectrum, and a laser generating light in the visible spectrum.

6. The game of claim 5, further comprising means for acquiring, storing, and manipulating information about players' names and rules for playing and scoring a plurality of dart games; and means for generating a dynamic output of the information and casting an image of the information on the floor in front of the dart board.

7. The game of claim 6, wherein the means for acquiring, storing, and manipulating information comprises a microprocessor; and wherein the means for generating a dynamic output of the information comprises an LED or LCD projector.

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