

[54] **ROTATING SCORING TARGET FOR A GAME AMUSEMENT MACHINE**

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[58] Field of Search.....273/127 R, 85 A, 86 H, 108, 273/113, 118, 119, 120 A, 121 A, 122 A, 123 A, 124 A, 125 A, 183 R, 183 C; 73/11, 12, 13

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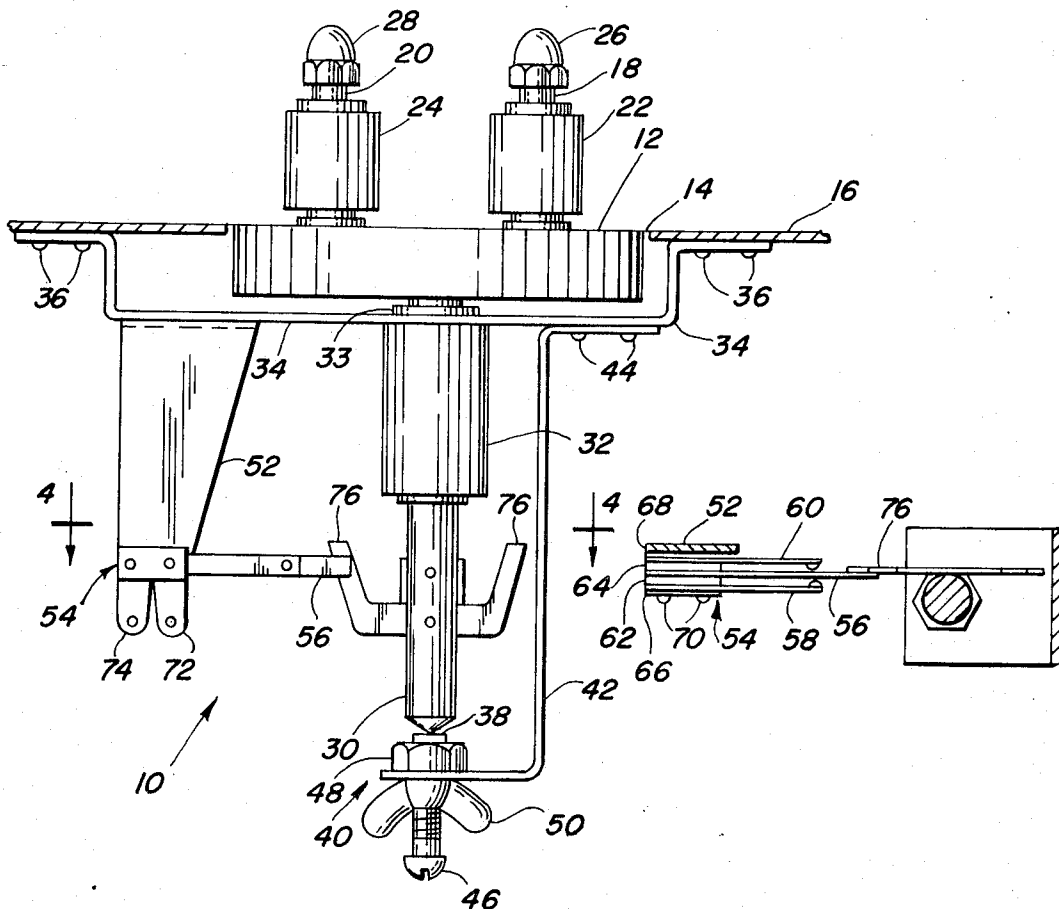
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[57] **ABSTRACT**

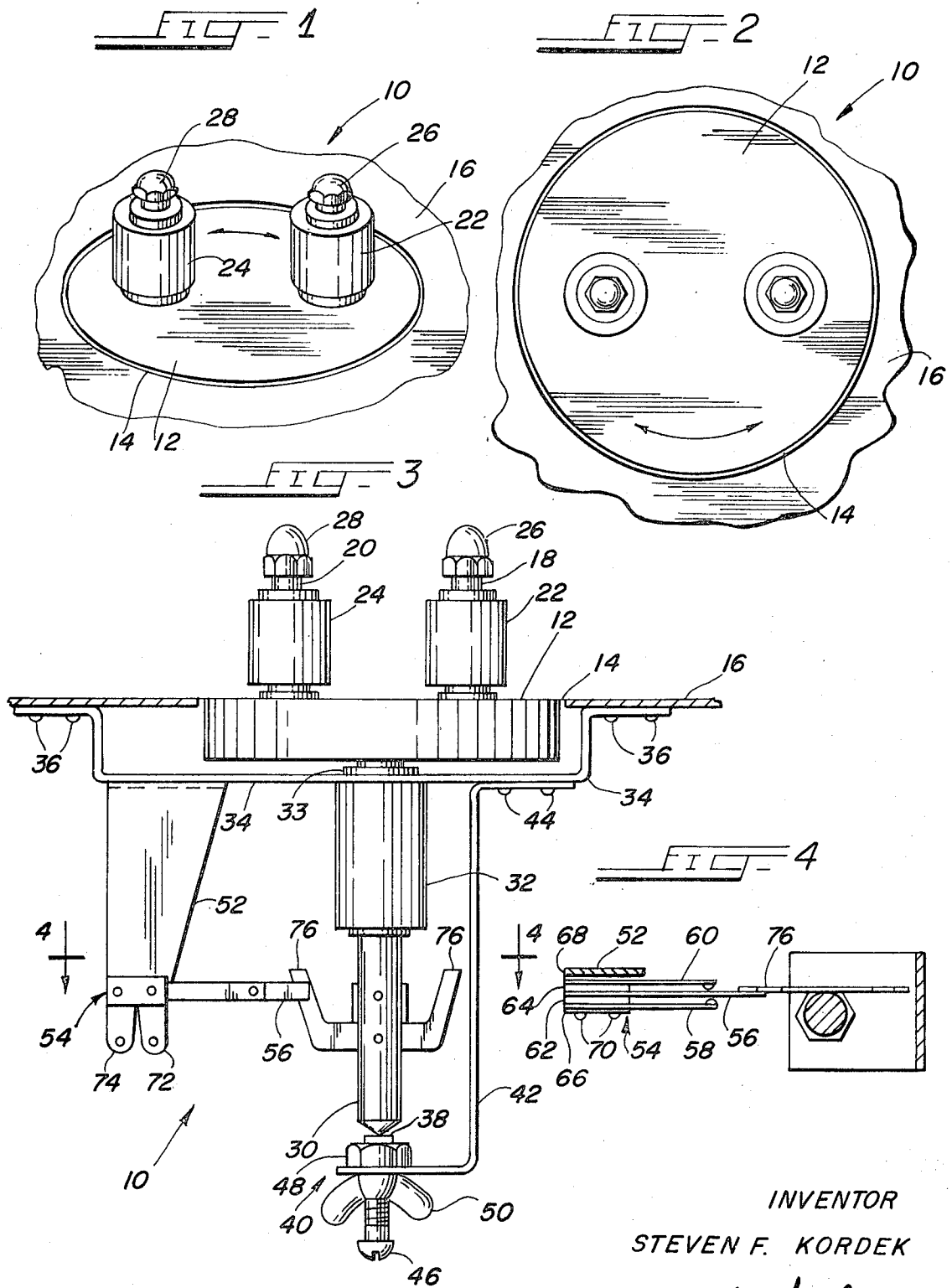
A scoring device for a game amusement machine such as a pinball machine, having a rotating element located on the playfield of the machine. Score-initiating devices (pinballs) are actuated by a player to subsequently drive the rotating element. The rotating element bears score-actuating devices to cause registration of a score dependent upon the amount of rotation thereof.

10 Claims, 4 Drawing Figures



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ROTATING SCORING TARGET FOR A GAME AMUSEMENT MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a scoring device for games involving elements of chance and player skill, and, more particularly this invention relates to a rotating scoring device for producing a multiplicity of score possibilities in a pinball machine.

2. Description of the Prior Art

Scoring devices for pinball machines heretofore known to the art generally comprise stationary bumpers or switches positioned on the playfield of the pinball machine. As the pinball rolls down the playfield, it contacts the various bumper or scoring switches on the playfield, thus generating a variety of scoring opportunities which are recorded to determine the total score for each game.

In addition to the normally stationary bumper and scoring switches positioned on the playfield of the pinball machine, typically the pinball machine has various "flippers" or ball-deflecting devices which may be actuated by the player to propel the ball back up the inclined playfield so that additional scoring may be achieved. For example, U.S. Pat. No. 2,507,716—Hughes, discloses a ball-deflecting device for propelling the pinball back up the playfield.

Other rotating or flipping devices heretofore known to the art serve as an integral part of the game being played by the pinball machine and are utilized to propel the pinball in a particular manner across the playfield. For example, in U.S. Pat. No. 3,329,433—Ryan, a rotating "swingable baseball bat" is provided on the playfield to contact the pinball in an attempt to propel the pinball in a direction whereby a greater score may be achieved.

Another type of rotating device utilized in conjunction with a pinball machine is the "turnstile" type of switching arrangement as illustrated in U.S. Pat. No. 2,308,297—Moxey et al. The "turnstile" switch of Moxey is for controlling a plurality of separate electrical circuits utilized in conjunction with the particular game played on the pinball machine. The Moxey et al. device is actuated only when the pinball rolls between two bumpers and causes a "turnstile" member to rotate a quarter of a revolution. In Moxey et al. the rotation of the turnstile switch causes certain bumpers to be activated, thereby permitting a score if the pinball thereafter contacts that particular activated bumper. No scoring is directly performed by the device as disclosed in Moxey et al. Thus, Moxey et al. does not provide a means of generating a multiplicity of score possibilities but merely controls the internal circuitry of the pinball machine as disclosed therein. Further, in Moxey et al. each engagement by a pinball produces a fixed 90° rotation of the turnstile, thus removing any element of chance associated with the degree of turnstile rotation.

None of the above-identified devices, nor any other prior art known to applicant, have an arrangement in which a purely random score is generated as a result of the amount of rotation produced in a member due to the force imparted to that member by a pinball. One of the difficulties in achieving this effect with an electrical scoring arrangement is that there must be a switch closure (or switch closures) to provide the scoring signal. Thus, after the score has been registered it is necessary to reopen the switch or switches.

Many prior art novelty effects have been attempted and some achieved. However, to successfully realize the prior art novelty effects it has been necessary to utilize motors or solenoids, or relay-controlled switching. All of these devices utilize relatively complex electrical arrangements with the attendant problems of malfunctions and erratic behavior.

SUMMARY OF THE INVENTION

On the playfield of a game amusement machine, such as a conventional pinball machine there is provided a rotating means in the form of a freely rotating flat circular plate positioned flush with the surface of the playfield within a rotating

concentric opening of the playfield. Attached to and extending upwardly from the flat circular plate are contact means in the form of two cylindrically shaped rotating bumpers positioned away from the center of the first circular disk opposite one another on the same diameter. Attached to the bottom of the flat circular plate at the center thereof is a shaft extending downwardly therefrom. Attached to the shaft and extending outwardly therefrom is an impulse-producing means in the form of two protruding arms extending in opposite directions from the shaft. Positioned adjacent the impulse-producing means is a score-generating means in the form of an electric switch having an actuating member thereon for engaging with the impulse-producing means when the plate and shaft are rotated.

The impulse-producing arms are formed of a suitable lightweight, flexible plastic material. Similarly, the actuating member for the switch, which is a movable contact arm, is formed of a resilient material. Thus, the switch will never be kept closed after a score has been registered, due to the opposing forces of the arms and the switch actuator.

Scoring is achieved by the present invention when a pinball (score-initiating device) rolling down the playfield of the pinball machine contacts one of the contact means, causing the circular plate, shaft and impulse-producing means to rotate. Rotation causes the impulse-producing means to contact the actuating member of the switch thereby closing the switch and generating a score signal. A multiplicity of score signals may be generated depending on the number of times that the shaft rotates. The amount of rotation of the device is dependent upon the force and angle with which the ball contacts the ball contact means. Thus, a purely random possibility of scores may be generated by the present invention, thereby increasing the interest and excitement by the player when playing this game.

It is not necessary that the pinball approach the device from any specific angle, since the circular plate rotates freely in either direction. Further, the number of score signals per revolution of the circular plate is dependent on the number of arms of the impulse-producing means. Thus, additional arms or additional switches may be added to the impulse-producing means to increase the total score per revolution of the circular plate.

Thus, it is an object of the present invention to provide a rotating scoring device for a pinball machine wherein a multiplicity of possible scores may be randomly achieved.

A further object of the present invention is to provide a rotating scoring device for a pinball machine wherein the pinball may actuate the device by striking the device from any angle.

It is a further object of the present invention to provide a rotating scoring device for a pinball machine whereby the possible score per revolution of the device may be easily and rapidly changed to provide a greater score per revolution.

It is still another object of this invention to provide a random scoring device in which score-registering switches are never retained in a closed condition after registration of a score.

Yet another object of this invention is to provide a novelty scoring device for game amusement machines that does not utilize complex electrical scoring signals.

These and other objects, advantages and features as shall hereinafter appear, and for the purposes of illustration, but not of limitation, an exemplary embodiment of the present invention as shown in the appended drawing as hereinafter described.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a front-elevated perspective view of a preferred embodiment of the present invention.

FIG. 2 is a top plane view of a preferred embodiment of the present invention.

FIG. 3 is a side plane view of a preferred embodiment of the present invention.

FIG. 4 is a sectional view of a preferred embodiment of the present invention taken substantially along line 4—4 of FIG. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to FIGS. 1, 2 and 3, a rotating scoring device 10 comprises a flat circular plate 12 positioned within a concentric circular opening 14 in the playfield 16 of the pinball machine (not shown). Attached to the flat circular plate 12 are vertically positioned studs 18 and 20. Positioned around studs 18 and 20 are elastic cylindrical bumpers 22 and 24. Rotatable elastic cylindrical bumpers 22 and 24 are held on studs 18 and 20 by pal nuts 26 and 28 respectively.

Attached to the bottom center of flat circular plate 12 is a shaft 30. Shaft 30 extends through a hollow cylindrical bearing guide 32. A cylindrical restricted extension 33 of bearing guide 32 extends through an opening in support member 34 and is expanded to hold bearing guide 32 in place. Support member 34 is attached by screws 36 to the bottom of playfield 16. The lower end of shaft 30 is formed into a conical point 38 which rides against an adjustable support 40. Adjustable support 40 is supported by a support member 42 which is affixed to support member 34 by screws 44. Adjustable support member 40 comprises a nylon bolt 46 extending through a hole in support member 42; and a machine nut 48 and wingnut 50 which secure nylon bolt 46 in place. The upper end of nylon bolt 46 provides free-riding bearing surface for conical point 38.

Also attached to support member 34 is support flange 52. Attached to the end of support flange 52 is switch 54. Switch 54 comprises a flexible actuator arm 56 and stationary contact arms 58 and 60 positioned on each side of and separated from actuator arm 56 by electrical insulating wafers 62 and 64 (See FIG. 4). Positioned on the outside of contact arms 58 and 60 to provide electrical insulation from the chassis of the pinball machine are insulating wafers 66 and 68 respectively. Switch 54 is attached to support flange 52 by screws 70. To provide electrical continuity to contact arms 58 and 60, contact lugs 72 and 74 are respectively provided on contact arms 58 and 60.

Attached to shaft 30 immediately opposite switch 54 is a double-arm member 76 formed of a flexible material. Double-arm member 76 is positioned to engage actuator arm 56 of switch 54 and deflect actuator arm 56 until it contacts either contact arm 58 or 60 (depending on the direction of rotation) when the shaft 30 is rotated.

When a pinball rolls down the inclined playfield of the pinball machine (not shown) and contacts either elastic cylindrical bumper 22 or 24, momentum is transferred from the pinball to the bumper causing flat circular plate 12 to rotate. Flat circular plate 12 can rotate in either direction depending upon the direction that the pinball is rolling when it contacts elastic cylindrical bumpers 22 or 24.

Rotation of flat circular plate 12 rotates shaft 30 within bearing guide 32, causing the ends of double-arm member 76 to travel in a circular path, thus, engaging actuator arm 56 of switch 54. Rotation of flat circular plate 12 in a clockwise direction causes double-arm member 76 to engage actuator arm 56 deflecting it until it contacts stationary contact arm 60, thereby completing an electrical circuit for scoring purposes. Similarly, rotation of flat circular plate 12 in a counter-clockwise direction causes double-arm member 76 to engage actuator arm 56 deflecting it until it contacts stationary contact arm 58, thereby completing an electrical circuit for scoring purposes. Double-actuator arm 76 deflects actuator arm 56 for each 180° revolution of flat circular plate 12. One complete revolution of flat circular plate 12 causes actuator arm 56 to be deflected twice, thus causing two scoring signals to be generated. The number of rotations of flat circular plate 12 is dependent upon the angle of impact and force of impact of the pinball upon elastic cylindrical bumpers 22 and 24.

After actuating arm 56 engages either stationary contact arm 58 or stationary contact arm 60, continued rotation of plate 12 causes arm member 76 to disengage actuating arm 56, thus permitting the switch to open as a result of the tendency of resilient arm 56 to its normal position. If the momentum of plate 12 is not sufficient to carry arm member 76 past the actuating arm 56, the switch is still opened by reverse rotation of plate 12 produced by the forces resulting from interaction of flexible arm member 76 and resilient actuating arm 56. Plate 12 is mounted for rotation sufficiently free that the forces produced by flexing of arms 56 and 76 suffice to produce such a reverse rotation. In this fashion, switch 54 is never left in a closed condition.

The present invention may be varied by attaching more than one double-arm member 76 to shaft 30 thereby increasing the total number of scoring signals for each revolution of flat circular plate 12. In fact, any number of double-arm members may be attached to shaft 30 to provide a multiplicity of score signals for each revolution of flat circular plate 12.

Conversely, the double-arm member 76 could provide a multiplicity of scores by the use of plurality of switches located in the same radius as switch support bracket 52.

Adjustable support 40 is provided in the present embodiment to permit the raising and lowering of flat circular plate 12 until it is perfectly flush with the surface of the inclined playfield 16. When flat circular plate 12 is flush with the inclined playfield 16, the pinball can freely roll across the slight gap of circular opening 14 between flat circular plate 12 and playfield 16.

It should be understood that changes, variations, and modifications may be effected in the details and operations of the present invention, without departing from the spirit and scope thereof, as defined in the appended claims.

1. In a game amusement machine having a playfield, score-initiating projectiles adapted to individually traverse the playfield, and registering means for receiving, interpreting and totaling score signals received from the playfield, a rotating scoring device comprising:

rotating means positioned within a comating opening in the playfield;

contact means on said rotating means for rotating said rotating means when contacted by one of the projectiles traversing the playfield;

score-actuating means attached to said rotating means for providing score impulses in response to rotation of said rotating means, the number of said impulses depending upon the degree of rotation of said rotating means; and score-generating means for activating the registering means in response to the score impulses provided by said score-actuating means,

whereby a multiplicity of total score signals may be generated by a projectile traversing the playfield, contacting said contact means, and causing said rotating means to rotate.

2. A rotating scoring device as claimed in claim 1 wherein: said rotating means comprises a circular plate positioned flush with the surface of the playfield in a comating concentric circular opening in the playfield.

3. A rotating scoring device as claimed in claim 2 wherein said contact means comprises:

at least one cylindrically shaped member attached to the upper surface of said circular plate and extending vertically above the surface of the playfield.

4. A rotating scoring device as claimed in claim 3 wherein said score-actuating means comprises:

a shaft attached at the center of the lower surface of said circular plate and extending downwardly therefrom;

impulse-producing means attached to said shaft and extending outwardly therefrom.

5. A rotating scoring device as claimed in claim 6 wherein said score-generating means comprises:

at least one switch in electrical continuity with the registering means having an actuating member extending out-

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wardly therefrom, said switch positioned adjacent to said impulse-producing means so that said impulse-producing means engages said actuating member when said circular plate is rotated, thereby actuating said switch and conducting scoring signals to the registering means.

6. A rotating scoring device as claimed in claim 7 wherein said impulse means actuates said switch at least twice for each revolution of said circular plate.

7. A rotating scoring device as claimed in claim 2 wherein said contact means comprises:

two cylindrically shaped members positioned on a common diameter equal distance from the center of the circular plate.

8. A rotating scoring device as claimed in claim 4 wherein said cylindrically shaped members are rotatably mounted to said circular plate.

9. A rotating scoring device as claimed in claim 7 wherein said actuating member of said switch is made of a resilient material, and

said impulse-producing means comprises a member having two arms extending in opposite directions from said shaft, said member made of a flexible resilient material.

10. In a game amusement machine having a playfield, score

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initiating projectiles adapted to individually traverse the playfield, and registering means for receiving, interpreting and totaling score signals received from the playfield, a rotating scoring device comprising:

a rotatable circular plate positioned flush with the surface of the playfield in a comating concentric circular opening in the playfield;

two cylindrically shaped members rotatably mounted to the upper surface of said circular plate on a common diameter equal distance from the center of the circular plate;

a shaft rigidly attached at the center of the lower surface of said circular plate and extending downwardly therefrom; an impulse-producing member attached to said shaft having two flexible arms extending in opposite directions outwardly from the shaft; and

a switch in electrical continuity with the registering means having an actuating member made of a resilient material extending outwardly therefrom, said switch positioned adjacent to said impulse-producing means so that said arms engage said actuating member when said circular plate is rotated, thereby actuating said switch and conducting scoring signals to the registering means.

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