Sept. 4, 1962 R. C. WOHLSTROM 3,052,060

SPARKING TOY

Filed June 24, 1960

FIG. 1

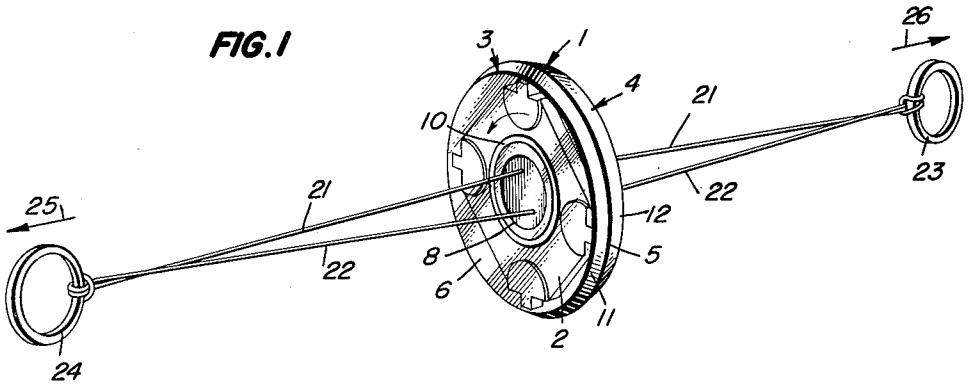


FIG. 2

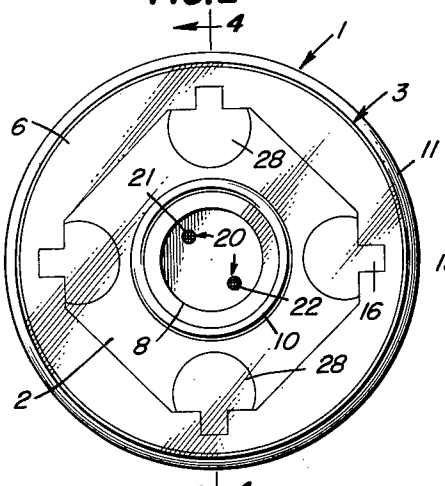


FIG. 3

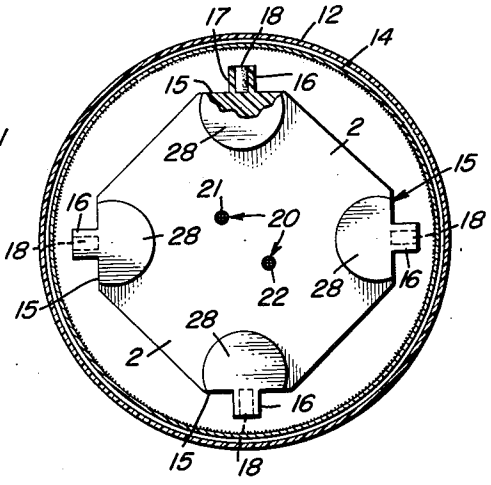


FIG. 4

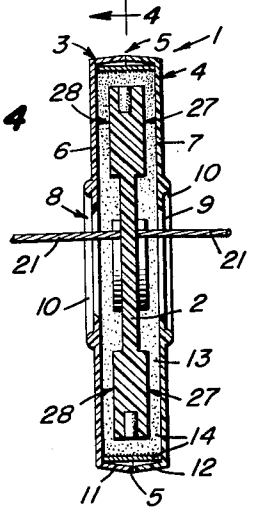
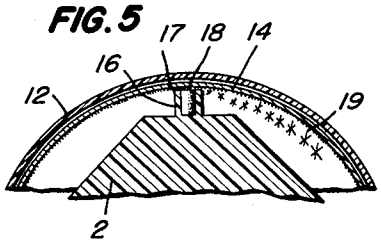


FIG. 5



INVENTOR

Robert C. Wohlstrom

BY B. P. Fishburn, Jr.

ATTORNEY

United States Patent Office

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SPARKING TOY

Robert C. Wohlstrom, 2305 S. Olive, Santa Ana, Calif.

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4 Claims. (Cl. 46—48)

This invention relates broadly to sparking toys and more particularly to sparking toys of the type having a rotatable center disc.

One of the objects of my invention is to provide a sparking toy which is simple in construction and adapted to be inexpensive in manufacture.

Another object of my invention is to provide a construction of sparking toy in which the center rotor provides wearing adjustment for the sparking elements.

Still another object of my invention is to provide a construction of sparking toy in which portions of the member carrying the sparking element simultaneously wear with the sparking elements as the member is rotated.

A further object of my invention is to provide a construction of rotatable rotor for sparking toy which prolongs the effective use of the sparking elements.

Other and further objects of my invention reside in the construction of the case enclosing the rotatable rotor, and the construction of the rotatable rotor which prevents the scratching of the entire interior surface of the case as set forth more fully in the specification by reference to the accompanying drawing, in which:

FIG. 1 is a perspective view of the sparking toy of my invention showing the rotatable rotor enclosed in a transparent case and controlled by a pull string coupled to said rotor and extending from either side thereof;

FIG. 2 is a front elevational view of the sparking toy of my invention showing the rotatable rotor loosely enclosed in the annular outer casing, the rotor control cord being shown in cross-section;

FIG. 3 is a vertical sectional view through the annular outer casing of the sparking toy and particularly showing the manner in which a lining of abrasive material is mounted in the annular casing, and the manner in which the sparking elements are mounted in the central rotor disc;

FIG. 4 is a cross-sectional view taken substantially on line 4—4 of FIG. 2 and particularly showing the portions carried by the rotor disc to prevent scratching of the entire interior surface of the annular casing and the manner in which the sparking elements are embedded in the rotor disc; and

FIG. 5 is a fragmentary vertical sectional view substantially similar to FIG. 3, and particularly showing the manner in which the rotor disc and the sparking elements contact the abrasive lining as the rotor disc is rotated.

Referring to the drawing in more detail, reference character 1 designates the transparent, or partly transparent, annular casing of the sparking toy of my invention which encloses the rotor disc 2 which is loosely disposed interiorly of said casing. Annular casing 1 is comprised of two sections designated at 3 and 4, bonded together at 5 to form the closed annular casing. The end walls 6 and 7 of the casing 1 are provided with central openings shown at 8 and 9 disposed in substantial alignment with each other. Raised ridge portions, shown at 10, may be provided on the end walls 6 and 7 of the annular casing sections 3 and 4, respectively, disposed about the central openings 8 and 9 to provide reinforcement for the periphery of the central openings and to provide ornamentation for the side walls 6 and 7.

The casing sections 3 and 4 are provided with inwardly depending annular peripheral walls 11 and 12, respectively, to form an enclosed interior cavity, designated at 13,

between the end walls 6 and 7 for housing the rotatable rotor disc 2. An abrasive strip or lining of abrasive material, designated at 14, is disposed adjacent the interior peripheral surface formed by the walls 11 and 12 and is secured thereto by adhesive or some other suitable bonding means. Thus an annular lining of abrasive material is provided about the interior peripheral wall of the annular case, as shown more clearly in FIG. 3. In lieu of a separate lining of abrasive material the interior surfaces of the peripheral walls 11 and 12 may be provided with a coating of abrasive material.

As shown more clearly in FIGS. 3 and 4, the rotor disc 2 is loosely disposed within the annular casing 1 so that, as it is rotated by the control cord extending from either side thereof, it is free to move up and down in a vertical plane and back and forth in the horizontal plane in random rotatable movement confined by the annular lining of abrasive material 14 and the annular casing wall formed by the peripheral walls 11 and 12. The rotor 2 is preferably polygonal in shape, being substantially a square with the corners removed as shown at 15. A projection or corner portion, as shown at 16, integral with said rotor extends outwardly from each surface 15 to form a plurality of circumferentially spaced corner portions or outwardly extending projections about the periphery of the rotor. Each corner portion 16 is substantially square in cross-section and is provided with an axial bore 17 in which a spark-producing element 18 is securely embedded, so that the end of the spark-producing element 18 is flush with the exterior end of the corner portion 16. These spark-producing elements may be flint material or other type materials which produce sparks when they come into moving contact with an abrasive material.

The rotatable rotor disc 2 is formed of a material which is relatively resistant to abrasive wear, although subject to slight wear by abrasion, such as plastic. Therefore, since the exterior ends of the sparking elements 18 are flush with the exterior ends of the corner portions 16, as the rotor disc is rotated by action of the control cord, the exterior ends of the spark-producing elements and the corner portions are simultaneously moved into random contact with the lining of abrasive material 14 so that both members are simultaneously subjected to the abrasive wear, as shown in FIG. 5. With this construction the corner portions and the spark-producing elements wear down simultaneously, but since the corner portions are constructed of a material which is relatively resistant to abrasive wear it retards the wearing-down of the spark-producing elements, thereby insuring effective, longer use of the sparking toy without substantially reducing the display of sparks produced by the sparking elements, as indicated at 19, when they move into contact with the abrasive lining 14. Thus the rotor provides a multiplicity of projections about its outer periphery which house spark-producing elements, such as flints, and retard abrasive wear of the flints.

The central portion of the rotor is provided with a pair of spaced central openings, shown at 20, which are disposed in substantial alignment with the central openings 8 and 9 in the end walls 6 and 7 of the annular casing 1. Strands 21 and 22 of the control cord extend through the central openings 20 of the rotor disc as shown more particularly in FIGS. 2 and 3. The control cord strands 21 and 22 are secured to a gripping ring 23 at one end thereof and after passing through central opening 9, central rotor openings 20 and central opening 8, as shown more particularly in FIGS. 1 and 4, are secured to gripping ring 24 at the opposite ends thereof.

To operate the toy, the gripping rings 23 and 24 are grasped by the hands of the operator and a twirling motion is imparted to the entire sparking toy, including the

rotor 2 and casing 1, such that the strands 21 and 22 adjacent each of the gripping rings are twisted upon themselves. The operator then applies a tension force to the strands 21 and 22 by pulling outwardly on gripping rings 23 and 24 as indicated by arrows 25 and 26 in FIG. 1. This tension force causes the strands 21 and 22 to untwist themselves and since they are threaded through central openings 20 of the rotor 2 they impart a rotative movement to rotor disc 2 as the strands untwist. This movement causes the rotor 2 to accelerate rapidly within the annular casing 1, causing the corner portions 16 carrying the sparking elements 18 to come into random movable contact with the lining of abrasive material 14 as indicated more clearly in FIG. 5. Each time a corner portion 16 and sparking element 18 carried thereby moves into contact with the abrasive lining 14 a stream of sparks, shown at 19 in FIG. 5, issues therefrom as long as the sparking element and abrasive lining are in contact with each other. Thus, as the rotor disc is rapidly rotated within the annular casing 1, each of the sparking elements in rapid random succession issues a stream of sparks, thereby presenting to the operator and the observer an annular ring of sparks about the interior periphery of an annular casing 1. The annular casing 1 is constructed of a transparent, or nearly transparent material, so that the ring of sparks is visible through the casing.

As the strands 21 and 22 unwind, the operator must then relax the tension applied to the strands so that the rapidly rotating rotor disc 2 by its inertia will twist together the strands 21 and 22, adjacent the gripping rings 23 and 24, in the opposite direction. The operator then again applies tension to the strands by means of the gripping rings, thus causing the rotating rotor 2 to abruptly stop and then rapidly accelerate in the opposite direction. This operation is rapidly and successively repeated by the operator to produce a brilliant annular ring of sparks about the interior periphery of the transparent case.

Since the rotor is moving rapidly the abrasion to the sparking elements as they move into contact with the abrasive lining would be extremely severe if it were not for the retarding force to abrasive wear supplied by the corner portions holding the sparking elements. Previous constructions of sparking toys have not provided means for preventing rapid wearing-out of the sparking elements, while my rotor construction insures longer sparking element life, thus enabling the sparking toy to have a longer period of usefulness and enjoyment than provided by previous constructions.

Since the strands 21 and 22 are loosely coupled to the rotor disc 2 through central openings 20 the rotor is free to move back and forth upon the control cord strands within the space 13 between the casing end walls 6 and 7. In order to prevent the entire side surfaces of the rotor from moving into contact with the end walls 6 and 7, thereby scratching the entire interior surfaces of the end walls 6 and 7, I provide the projections indicated at 27 and 28 on opposite side walls of the rotor 2 adjacent each corner portion 16, so that the side surface areas presented by the projections 27 and 28 are the only portions of the rotor which come into contact with the interior surfaces of end walls 6 and 7, while the rotor is rotated; allowing only a portion of the interior surfaces of the end walls 6 and 7 to become scratched. This prevents the transparent casing 1 from becoming too scratched or dirty-looking after substantial use of the toy. The spacing projections 27 and 28 are preferably molded integrally with the rotor 2 as shown more particularly in FIG. 4, but these projections could also be separate members bonded to the sides of the rotor.

While I have described my invention in certain preferred embodiments, I realize that modifications may be made, and I desire that it be understood that no limitations upon my invention are intended other than may be imposed by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States, is as follows:

1. A toy of the character described comprising an annular casing formed of material which is at least partly transparent and including a peripheral wall and end walls having substantially aligned central openings, a lining of abrasive material for said peripheral wall, a rotor disc loosely mounted within said annular casing and retained therein by said peripheral wall and end walls, said rotor disc formed of material which is relatively resistant to abrasive wear and having a plurality of circumferentially spaced corner portions having peripheral faces and a pair of spaced central openings formed therethrough in substantial alignment with the first-named openings, spark-producing elements bodily embedded within said spaced corner portions and fastened rigidly therein to become an integral part thereof and having their outer surfaces normally flush with the peripheral faces of the corner portions and engageable with said lining when the rotor disc is revolved inside of said casing, whereby the elements and said corner portions of the rotor disc are subjected to abrasive wear as composite units and abrasive wear on said elements is therefore greatly retarded, and flexible elements extending through said openings of the rotor disc and end walls and adapted to be first twisted together and then tensioned for imparting rotation to the rotor disc inside of said casing.

2. A toy of the character described as set forth in claim 1 in which said rotor disc is formed of plastic.

3. A toy of the character described in claim 1 in which said rotor disc is polygonal in shape and carries four corner portions about the periphery thereof.

4. A sparking toy comprising an annular casing formed of material which is at least partly transparent and including a peripheral wall and end walls having substantially aligned central openings, abrasive material interiorly disposed about said peripheral wall, a rotor disc loosely mounted within said annular casing and retained therein by said peripheral wall and end walls, said rotor disc formed of material which is relatively resistant to abrasive wear and having a plurality of circumferentially spaced corner portions and a pair of spaced central openings formed therethrough in substantial alignment with the first mentioned openings, spark-producing elements embedded within said corner portions and fastened rigidly therein to become an integral part thereof and having their outer surfaces normally flush with the outer ends of the corner portions and engageable with said abrasive material when the rotor disc is rotated inside said casing, whereby the elements and said corner portions of the rotor disc are subjected to simultaneous abrasive wear as composite units and abrasive wear on said elements is thereby greatly retarded, flexible elements extending through said openings of the rotor disc and end walls and adapted to be first twisted together and then tensioned for imparting rotation to said rotor disc inside said casing, and side projections extending from both sides of said rotor disc adjacent the corner portions for spacing said rotor disc from said casing end walls to reduce scratching of the end walls as the rotor disc is rotated.

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