The present invention provides a flying disc toy, which includes a disc body having a circular and flat shape, the disc body defining a plurality of cutouts, and a cord attached to a center of the disc body. The cord is attached via a bearing, and the bearing has a hollow interior to hide a knot in the cord. A cover may be provided on the underside to enclose the bearing. A bouncing ball may be provided on the underside of the disc body. The flying disc toy has an outer ring made of a soft material for enhanced safety. The flying disc toy may be used in a variety of ways, including being tossed, swung, bounced on the ground, etc.
FLYING DISC TOY WITH CORD

[0001] This application claims priority under 35 USC §119 (e) from U.S. Provisional Patent Application No. 61/215,068, filed May 4, 2009, which is herein incorporated by reference in its entirety.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention
[0003] This invention relates to a flying disc toy, and in particular, it relates to a flying disc toy with an elastic cord attached at the center of the disc.
[0004] 2. Description of the Related Art
[0005] Flying disc toys have been widely available. U.S. Pat. Nos. 6,585,552 and 6,595,823 describe a flying disc toy having an elastic or non-elastic cord attached at its center.

SUMMARY OF THE INVENTION

[0006] The present invention is directed to an improved flying disc toy.
[0007] An object of the present invention is to provide a flying disc toy that has improved aerodynamic properties, is easy to handle, and can be played in more ways.
[0008] Additional features and advantages of the invention will be set forth in the descriptions that follow and in part will be apparent from the description, or may be learned by practice of the invention. The objectives and other advantages of the invention will be realized and attained by the structure particularly pointed out in the written description and claims thereof as well as the appended drawings.
[0009] To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described, the present invention provides a flying disc toy which includes: a disc body having a circular and flat shape, the disc body defining a plurality of cutouts; and a cord attached to a center of the disc body. Additional features may be provided for the flying disc toy, including a cover or a bouncing ball or other center weight attached to a center area on the underside of the disc body, a rim portion with an outer ring made of a soft material, and air holes provided in the rim portion.
[0010] In another aspect, the present invention provides a flying disc toy which includes: a disc body having a circular and flat shape; a cord attached to a center of the disc body; and a bouncing ball attached to a center area on the underside of the disc body, the bouncing ball having a rounded portion at its bottom. Additional features may be provided for the flying disc toy, including cutouts in the disc body, a rim portion with an outer ring made of a soft material, and air holes provided in the rim portion.
[0011] In yet another aspect, the present invention provides a flying disc toy which includes: a disc body having a circular and flat shape and defining a center hole; a bearing having a through hole; and a cord, wherein a first end of the cord passes through the center hole of the disc body and the through hole of the bearing, wherein a knot is formed in the first end of the cord, wherein the bearing is disposed between the knot and the disc body, the bearing defines a recess or a hollow interior, and the knot is disposed within the recess or the hollow interior of the bearing. The disc body is raised in a center portion and the bearing is disposed on an underside of the disc body below the raised center portion.

[0012] It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIGS. 1a and 1b are top view and side cross-sectional view, respectively, of a flying disc toy according to an embodiment of the present invention.
[0014] FIGS. 2 and 3 are top views of flying discs toys according to alternative embodiments of the present invention.
[0015] FIGS. 4-6 are cross-sectional views of flying disc toys according to alternative embodiments of the present invention, illustrating alternative structures by which the soft ring is joined to the body of the disc.
[0016] FIGS. 7-9 are cross-sectional views of flying disc toys according to embodiments of the present invention, illustrating alternative structures for attaching the cord to the body of the disc.
[0017] FIG. 10 illustrates a flying disc toy according to an embodiment of the present invention, where a bounce ball is attached to the underside of the disc.
[0018] FIG. 11 illustrates a flying disc toy according to an embodiment of the present invention, where a bounce ball is attached to the cord and located on the underside of the disc.
[0019] FIG. 12 illustrates a flying disc toy according to an embodiment of the present invention, where a set of air holes are provided along the rim of the disc.
[0020] FIG. 13 is a perspective view of a flying disc toy according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] Embodiments of the present invention provide an improved flying disc toy 10 with an elastic cord 16 attached at its center, as shown in FIG. 13. The elastic cord 16, preferably about 3 to 5 ft long, extends from an upper side of the flying disc, with a handle 21 or wrist band 21 provided at the other end to allow the user to control the flying disc toy with the cord.

[0022] The flying disc toy may be used in a variety of ways. Tossing the disc in an outward motion will cause the disc to spin in a circular motion. The user can use the cord to control the flying direction or other motion of the disc. When the disc is tossed outwardly, the elastic cord will stretch and then contract, causing the disc to return to the user. The user can also toss the disc gently to create a spin in it, and then hold the spinning disc by the cord and make it move in a variety of ways, such as swinging left and right like a pendulum, or moving up and down like a yo-yo, or circling overhead, or combinations of such motions, etc. The spinning action of the disc helps to maintain the direction of the rotational axis as it spins or flies.

[0023] A bouncing ball may be additionally provided on the underside of the center of the flying disc toy to allow the disc to be bounced like a ball or spun like a top on the ground. The user can use the cord to control the disc toy as it is bounced or spun on the ground.

[0024] Various embodiments of the present invention are described below with reference to the drawings. In the descriptions below, dimensions (sizes) are given for some of
the embodiments, but it should be understood that other suitable sizes may be used and the invention is not limited to the particular sizes.

FIG. 1a is a top view of a flying disc toy according to an embodiment of the present invention. FIG. 1b is a side cross-sectional view of the flying disc toy along the direction B-B' of FIG. 1a. The flying disc toy 10 has a circular shape in the top view. In a preferred embodiment, the disc is approximately 12 to 13 inches in diameter. A circular interior portion 11 (also referred to as the disc body for convenience) of the disc 10, preferably about 10 to 11 inches in diameter, has a generally flat shape. In the illustrated embodiment (see FIG. 1b), the cross-section of the interior portion 11 has a gently raised profile that is higher in the center, with the center portion 11c (having a diameter of about 2.5 inches) raised more steeply. A rim portion 13 of the disc 10, preferably about 1 inch wide, is curved upwards and then downwards to form a rim having a height of about 0.8 to 0.9 inches.

FIG. 2. It should be noted that the cross-sectional shape illustrated in FIG. 1b is merely exemplary; other shapes may be used. For example, the interior portion 11 may be planar rather than having a raised profile; the rim portion 13 may curve downwards from the disc body without first curving upwards; etc.

FIG. 3 In the disc body 11, a set of large cutouts (openings) 14 are formed as shown in FIG. 1a. Note that the cutouts are not shown in the cross-sectional view FIG. 1b (in other words, FIG. 1b is drawn as if there were no cutouts). The number of cutouts may be three, five, etc. The cutouts 14 are arranged symmetrically around the rotation axis of the disc 10, and may have any suitable shape. Additional (smaller) cutouts may be formed and should also be arranged symmetrically around the rotation axis.

FIG. 2 and FIG. 3 are top views of two flying disc toys 10a and 10b according to alternative embodiments of the present invention. The discs 10a and 10b are similar to the disc 10 shown in FIGS. 1a and 1b, except that the cutouts 14a and 14b on the discs 10a and 10b have different shapes than those shown in FIG. 1a. The shapes of the cutouts 14a, 14b, 14c and 14d shown in FIGS. 1a, 2 and 3 are merely exemplary and any suitable shapes can be used. Preferably, the cutouts 14 (14a, or 14b) collectively occupy a half or more of the area of the interior portion 11 of the disc 10 (10a or 10b). Providing cutouts on the disc toy changes the aerodynamics of the disc as it is tossed and flies in the air. The cutouts may also give the disc a desired appearance as it spins.

Referring back to FIGS. 1a and 1b, the disc body 11 may be made of any suitable materials, preferably a rigid plastic material. Preferably, the disc body 11 has a smooth surface. Optionally, some parts 11c of the disc body may have a textured or rough surface, which may enhance the aerodynamics and/or the appearance of the disc.

The outermost part 15 of the disc 10 (a part of the rim portion 13) may be made of a material that is softer than the material of the disc body, such as molded foam, soft plastic or rubber, forming a soft ring. The soft ring 15 enhances safety as the disc is tossed. In addition, an outer ring made of rubber will enable the disc to roll on the ground more smoothly.

In the embodiment illustrated in FIG. 1b, the soft ring 15 is secured to the rest of the disc by providing a circular groove in the soft ring which, fits over a flange formed of the hard plastic material. FIGS. 4-6 are cross-sectional views of alternative embodiments of the present invention, showing alternative structures by which the soft ring is joined to the body of the disc. In the structure shown in FIG. 4, the same hard plastic material that forms the disc body 11 is extended upwards at the rim to form a sidewall 13a, and the soft ring 15c wraps around both inside and outside of the sidewall 13c.

In the structure shown in FIG. 5, the same hard plastic material that forms the disc body 11 is curved upwardly and then downwardly to form a rim 13d, and a thin layer of soft material is formed over the downward curving portion of the rim to form the soft ring 15d. Preferably, the soft ring 15d is a rubber material co-molded with the rim 13d. In the structure shown in FIG. 6, the same hard plastic material that forms the disc body 11 is curved upwardly and then downwardly to form a rim 13e, where the downward curving part of the rim has a series of holes. A ring 15e made of a soft material is provided with a series of inward protrusions that fit into the holes along the rim 13e to secure the ring 15e to the disc. Of course, other structures may be employed to secure the soft ring to the rest of the disc.

As mentioned earlier, a cord is attached at the center of the flying disc toy to allow a user to control the disc toy. The cord may be an elastic cord or non-elastic cord and may have any suitable thickness (diameters) and length. The cord may be made of any suitable materials, such as yarn, rubber, cotton, polyester, nylon, polypropylene, etc. If an elastic cord is used, it may be a straight cord or a coiled elastic twist cord.

FIGS. 7, 8 and 9 illustrates alternative structures for attaching a cord 16 to the body of the disc. As shown in FIGS. 7-9 (see also FIGS. 1a and 1b), a hole 12 is provided on the disc body 11 at its geometric center. In one embodiment, the hole is approximately 0.12 inches in diameter, but other sizes may also be used, depending on the thickness of the cord. The cord 6 passes through the hole 12, and a knot 16a is tied in the cord on the underside of the disc 10. As mentioned earlier, the other end of the cord 16 is provided with a handle, a wristband, or other attachments (not shown in FIGS. 7-9) for easy handling by the user.

In the embodiments of FIGS. 7 and 8, a bearing 17a or 17b with a through hole is located between the knot 16a and the center hole 12 of the disc, where the cord 16 passes through the through hole of the bearing. The bearing may have a ball shape (FIG. 7), a bell shape (FIG. 8), or other shapes as long as it has a smooth and rounded top portion for contacting the disc 10. As the disc spins, the bearing 17a/17b can rotate freely with respect to the disc.

The bearing 17a/17b preferably has a recessed portion or has a hollow interior as shown in FIGS. 7 and 8, so that the knot 16a is disposed within the recess or hollow interior of the bearing 17a/17b. The knot may be secured to the bearing by an adhesive material. Having the knot contained inside the bearing gives the disc more stability as it is tossed, and keeps the cord from getting twisted and tangled as the disc spins.

In the embodiment of FIGS. 7 and 8, the disc body has a small downward protrusion 12a around the center hole 12, such that only the bottom portion of the protrusion contacts the bearing 17a/17b. This feature reduces the contact area between the bearing and the disc body to minimize friction.

In some embodiments, the center portion 11a of the disc has a raised profile, which provides a space under the disc for the bearing 17a/17b. A cover 18 may be provided to enclose the bearing, as shown in FIG. 8. In this embodiment, the cover 18 is located on the underside of the disc 10 below
the raised center portion 11a, and has a flat bottom that is located approximately in the same plane as the lower-most part 11b of the disc body. The cover 18 may be snapped or glued or screwed to the body of the disc. A small drain hole may be provided on the cover or between the cover 18 and the body of the disc to allow any liquid or dust that entered the enclosed space to be removed. The cover 18 serves several functions. First, it protects the bearing by keeping dirt and moisture away so that they do not affect the performance of the disc toy. Second, it conceals the bearing to give the disc toy a clean finished look. Third, it helps to keep the bearing in place during flight when the cord is not tensioned. For example, a user may toss the disc toy by completely letting go of the cord. In such a case, the cord is not tensioned, and the bearing may move freely with respect to the disc. Without the cover 18, the bearing might move too far away from the disc body.

[0038] In the embodiment of FIG. 9, a bearing is not provided, and the knot 16a directly contacts the disc body. A cover 18 is provided on the underside of the disc in the center area to keep the knot 16a enclosed in a space formed by the cover 18 and the body of the disc.

[0039] It should be noted that in the above description, although the cord 16 is said to be "attached" to the disc body, it is not fixedly attached to the disc body; in fact the end of the cord can move freely in the center hole 12, especially when the cord is not under tension. Therefore, the meaning of the term "attached" should be understood broadly in this context.

[0040] FIG. 10 illustrates another embodiment of the flying disc toy 10 having a bouncing ball 19 attached to the underside of the disc toy at the center. The ball 19 may be solid or hollow, and may be made of any suitable materials that allow it to bounce, such as plastic, rubber, foam, etc. It may have any suitable shape and size. In the embodiment shown in FIG. 10, the ball 19 is a slightly elongated half-sphere attached to the underside of the disc body, with the round portion of the half-sphere facing downwards for bouncing. The bouncing ball 19 also functions as a cover to cover the bearing and the knot of the cord (not shown in FIG. 10). Alternatively, both a cover and a ball may be provided, with the ball sitting over the cover. As another alternative, the ball may have an internal partition located close to the disc body to serve the function of keeping the bearing in place as discussed earlier.

[0041] In an alternative embodiment shown in FIG. 11, a spherical bouncing ball 19a is located on the underside of the disc 10 and attached to the bearing 17c. In this embodiment, the bouncing ball 19a is not attached to the body 11 of the disc.

[0042] The bouncing ball 19/19a allows the user to bounce the disc toy 10 on the ground. The bouncing ball 19 of FIG. 10 also allows the user to spin the disc like a top on the ground.

[0043] In some embodiments, as shown in FIG. 12, a series of air holes 20 are provided along the rim portion 13 of the disc 10. In the illustrated embodiment, the rim portion 13 has an upside-down U shape in the cross-sectional view, and the air holes 20 are preferably located near the top of the rim 13. When the disc 10 spins in one direction as indicated by the arrow labeled S, air can flow upwards through the air holes 20 and laterally in an opposite direction relative to the spin direction, as indicated by the arrows labeled A. The airflow may help to stabilize the disc when it is flying.

[0044] As pointed out earlier, the cutouts 14 on the disc body 11 provide desirable aerodynamic effects for the disc as it is tossed and flies in the air. This effect is especially significant when the disc toy is used with a bouncing ball and spins on the ground as a top, and helps the disc toy to spin in a more balanced manner.

[0045] In preferred embodiments of the present invention, the disc body 11 is raised in the center in the cross-sectional view. This may enhance the balance and stability of the disc as it is tossed in the air. This cross-sectional shape also allows the elastic cord to move more freely as the disc is spinning, and gives the user more control of the disc.

[0046] As described above, the soft ring 15, the cover 18 and the bouncing ball 19 have their respective functions. In addition, these features may contribute to achieving a desired weight distribution to help stabilize and balance the disc toy as it flies. The cover 18 or the bouncing ball 19, or other structures, may function as a center weight; the soft ring 15 may add weight to the rim portion of the disc. These features, combined with other features such as the cutouts 14 and air holes 20, can accomplish an overall design that has good aerodynamic properties. Not all of these features are required in the flying disc toy.

[0047] It will be apparent to those skilled in the art that various modifications and variations can be made in the flying disc toy of the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover modifications and variations that come within the scope of the appended claims and their equivalents.

What is claimed is:
1. A flying disc toy comprising:
   a disc body having a circular and flat shape, the disc body defining a plurality of cutouts; and
   a cord attached to a center of the disc body.
2. The flying disc toy of claim 1, wherein the cutouts collectively occupy a half or more of an area of the disc body.
3. The flying disc toy of claim 1, wherein the disc body defines a center hole through which a first end of the cord passes, wherein the flying disc toy further comprises a bearing having a through hole through which the first end of the cord passes, wherein a knot is formed in the first end of the cord, wherein the bearing is disposed on an underside of the disc body and located between the knot and the disc body, wherein the bearing has a recess or a hollow interior, and wherein the knot is disposed within the recess or the hollow interior of the bearing.
4. The flying disc toy of claim 3, wherein the disc body has a protrusion around the center hole that protrudes toward the bearing.
5. The flying disc toy of claim 3, further comprising a cover attached to a center area on the underside of the disc body, the cover having a flat bottom, wherein the bearing and the knot are disposed in a spaced enclosed by the cover and the disc body.
6. The flying disc toy of claim 3, further comprising a bouncing ball attached to a center area on the underside of the disc body, the bouncing ball having a rounded portion at its bottom, wherein the bearing and the knot are disposed in a spaced enclosed by the cover and the disc body.
7. The flying disc toy of claim 1, further comprising a bouncing ball disposed on an underside of the disc body.
8. The flying disc toy of claim 1, further comprising a center weight attached to a center area of the disc body.
9. The flying disc toy of claim 1, wherein the disc body is raised toward the center.
10. The flying disc toy of claim 1, further comprising a rim portion extending from the disc body, wherein the disc body is formed of a first material, and wherein the rim portion includes an outer ring formed of a second material which is softer than the first material.

11. The flying disc toy of claim 1, further comprising a rim portion extending from the disc body, wherein the rim portion defines a plurality of air holes located near a top of the rim portion.

12. A flying disc toy comprising:
   a disc body having a circular and flat shape;
   a cord attached to a center of the disc body; and
   a bouncing ball attached to a center area on an underside of the disc body, the bouncing ball having a rounded portion at its bottom.

13. The flying disc toy of claim 12, wherein the disc body defines a plurality of cutouts.

14. The flying disc toy of claim 12, wherein the disc body is raised toward the center.

15. The flying disc toy of claim 12, further comprising a rim portion extending from the disc body, wherein the disc body is formed of a first material, and wherein the rim portion includes an outer ring formed of a second material which is softer than the first material.

16. The flying disc toy of claim 12, further comprising a rim portion extending from the disc body, wherein the rim portion defines a plurality of air holes located near a top of the rim portion.

17. A flying disc toy comprising:
   a disc body having a circular and flat shape and defining a center hole;
   a cord having a through hole; and
   a cord, wherein a first end of the cord passes through the center hole of the disc body and the through hole of the bearing, wherein a knot is formed in the first end of the cord,
   wherein the bearing is disposed between the knot and the disc body, the bearing defines a recess or a hollow interior, and the knot is disposed within the recess or the hollow interior of the bearing.

18. The flying disc toy of claim 17, wherein the disc body has a protrusion around the center hole that protrudes toward the bearing.

19. The flying disc toy of claim 17, wherein the disc body is raised in a center portion and the bearing is disposed on an underside of the disc body below the raised center portion.

20. The flying disc toy of claim 19, further comprising a cover attached to the center portion on the underside of the disc body, the cover having a flat bottom, wherein the bearing and the knot are disposed in a spaced enclosed by the cover and the disc body.

21. A flying disc toy comprising:
   a disc body having a circular and flat shape and defining a center hole;
   a bearing having a through hole;
   a cord, wherein a first end of the cord passes through the center hole of the disc body and the through hole of the bearing, wherein a knot is formed in the first end of the cord; and
   a cover attached to a center area on an underside of the disc body, wherein the bearing and the knot of the cord are disposed within a spaced defined between the cover and the disc body.

22. The flying disc toy of claim 21, wherein the disc body is raised toward the center area.

23. The flying disc toy of claim 21, wherein the cover is a bouncing ball.

24. The flying disc toy of claim 21, wherein the cover has a flat bottom.

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