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[54] **BATON**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 638,032, May 12, 1967, abandoned.

[52] **U.S. Cl.** ..... **84/477 B**
[51] **Int. Cl.** **G09b 15/02**
[58] **Field of Search** ..... 84/477 B

[56] **References Cited**

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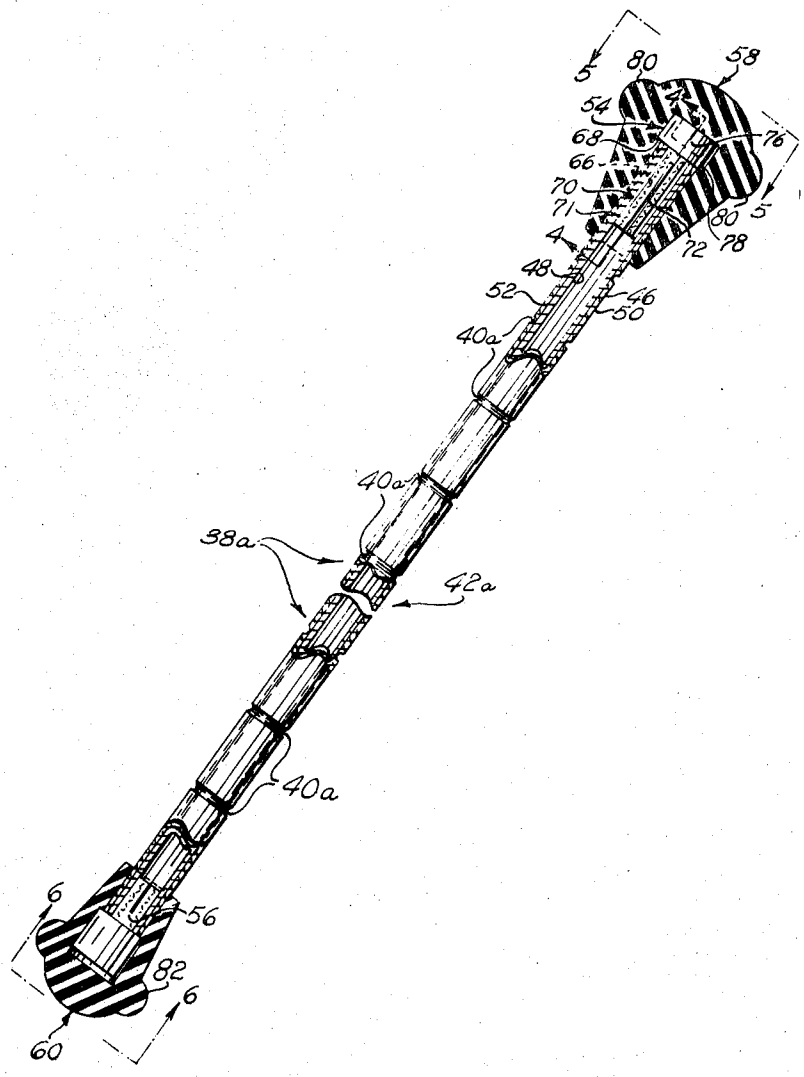
[57] **ABSTRACT**

A baton shaft is constructed from aluminum tubing which is anodized and dyed a desired color. Portions of the dyed surface are then removed to expose the aluminum which contrasts with the dyed surface portion and forms a design. A steel member is inserted inside the aluminum tube to provide for additional strength of the baton shaft. Balancing weights are secured to each end of the baton shaft. A ball is then positioned on one end of the baton shaft and a tip is positioned on the other. The ball and tip have a number of lobes thereon to reduce rolling of the baton on a surface.

7 Claims, 6 Drawing Figures



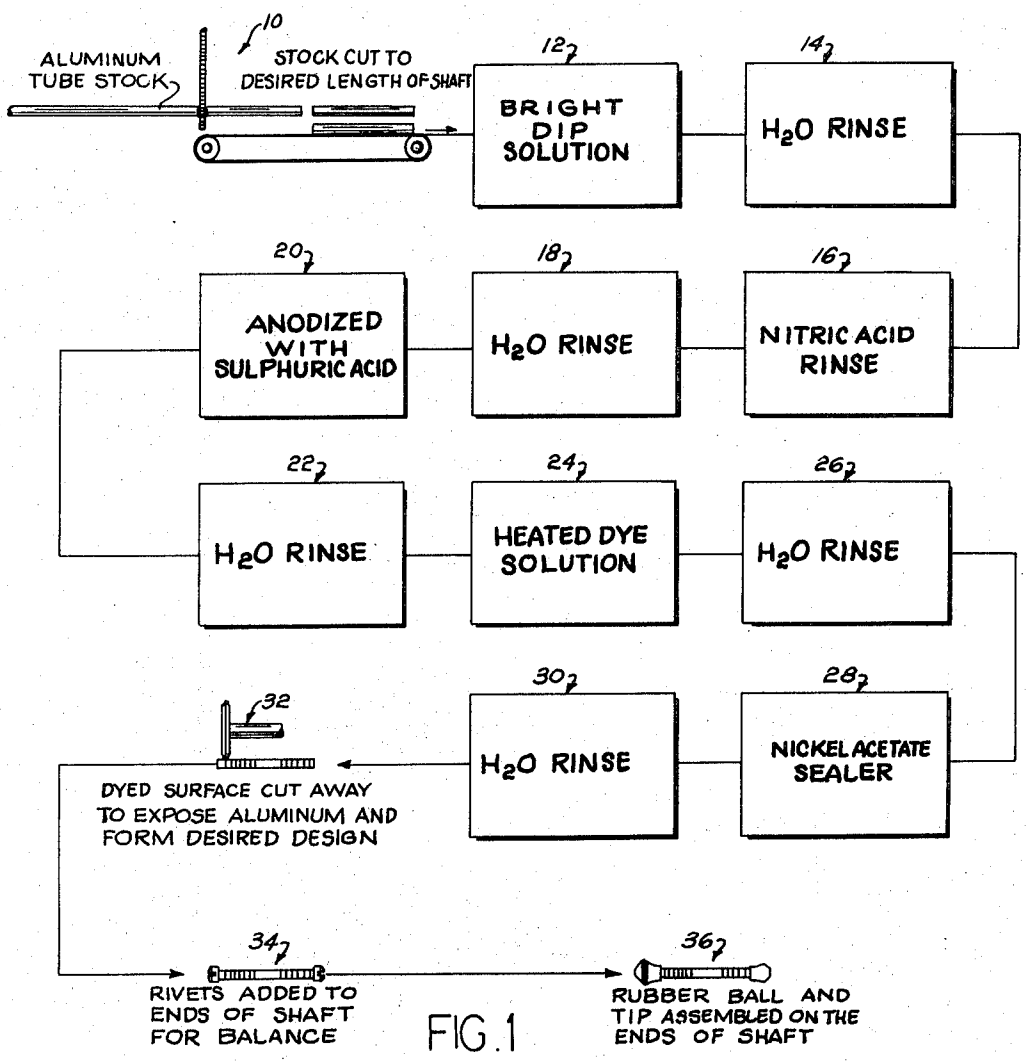


FIG. 1

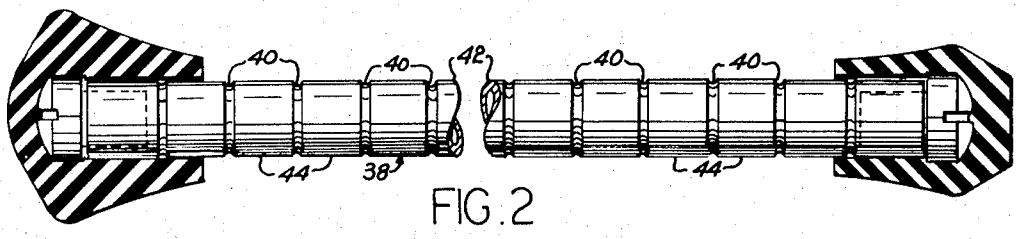


FIG. 2

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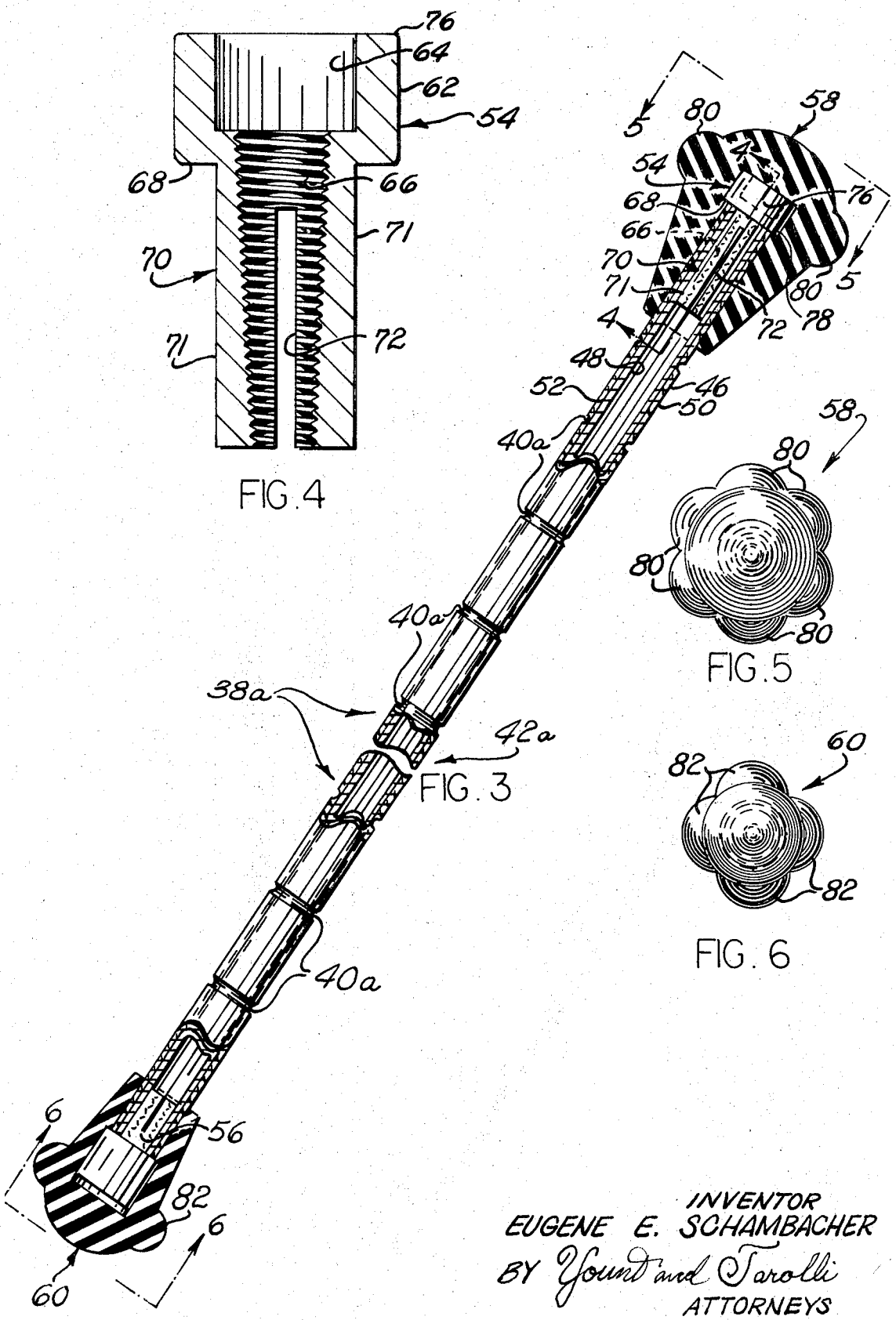

FIG. 4

FIG. 5

FIG. 3

FIG. 6

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BATON

The present application is a continuation-in-part of copending application Ser. No. 638,032, filed May 12, 1967, entitled "Baton" and now abandoned.

The present invention relates to a baton and more particularly to a decorative baton shaft.

It is an important object of the present invention to provide a new and improved baton which is relatively light in weight, making it easy to twirl, since it requires less force to move it through the fingers, but yet has sufficient strength to resist permanent deformation when subjected to the forces encountered during normal use, and is highly resistant to corrosion, easily cleaned, and is extremely decorative.

Another object of the present invention is to provide a new and improved baton having a tubular anodized aluminum shaft with the anodized surface thereof dyed a particular color and portions of the dyed surface removed to expose the aluminum which contrasts with the colored surface portions and forms a design thereon.

A further object of the present invention is to provide a new and improved baton having a tubular anodized aluminum shaft with the anodized surface dyed a particular color and portions thereof removed to expose the aluminum which contrasts with the colored surface and having a steel member which engages the inside of the tubular aluminum shaft to thereby provide additional strength.

A still further object of the present invention is to provide a new and improved baton having a tubular anodized aluminum shaft with the anodized surface thereof dyed a particular color and portions of the dyed surface removed to expose the aluminum which contrasts with the colored surface portions and a ball positioned on one end of the shaft and a tip positioned on the other end of the shaft, which ball and tip have lobes thereon to reduce rolling of the baton when supported by a surface.

Yet a further object of the present invention is to provide a new and improved baton having a tubular anodized aluminum shaft with anodized surface thereof dyed a particular color and portions of the dyed surface removed to expose the aluminum which contrasts with the colored portions and which baton includes weights on each of the ends of the shaft to balance the baton when it is twirled.

A still further object of the present invention is to provide a new and improved baton having a tubular anodized aluminum shaft with the anodized surface thereof dyed a particular color and portions of the dyed surface removed to expose the aluminum which contrasts with the colored surface portion and forms a design thereon so that a reminder grip is provided by the circles of light created by the exposed aluminum portions which contrast with the colored circles created by the colored surface when the baton is twirled.

These and other objects will become apparent from the following description of a preferred embodiment of the present invention made in conjunction with the attached drawings forming a part thereof and in which:

FIG. 1 is a schematic representation of the method of making a baton according to the present invention;

FIG. 2 is an elevational view of a baton shaft with portions shown in section and embodying the present invention;

FIG. 3 is an elevational view of a second embodiment of a baton shaft of the present invention with portions thereof shown in section and a weighted member on each end of the shaft;

FIG. 4 is a sectional view of one weighted member shown in FIG. 3;

FIG. 5 is an end view of the baton shown in FIG. 3 taken along lines 5—5 thereof; and

FIG. 6 is an end view of the baton shown in FIG. 3 and taken along lines 6—6 thereof.

The present invention provides a novel baton shaft of the type which is adapted to be twirled and a novel method of making the baton shaft. The baton shaft is constructed from aluminum tubing which, it has been discovered, possesses many favorable attributes for use as the shaft of a baton. One of the important attributes of aluminum is that it is comparatively light in weight and when used as a baton shaft it has been found that it can be readily and economically balanced to provide good twirling characteristics. Furthermore, aluminum possesses the requisite flexibility and strength making it capable of withstanding permanent deformation when subjected to the usual bending and other types of stresses to which a baton is subjected in the course of normal use. It has also been discovered that additional forces and stresses on the baton shaft may be withstood by providing a steel member which engages the inside of the aluminum tube. Another advantage found in the use of aluminum as a baton shaft is that it can be anodized to make the shaft highly resistant to corrosion and other deleterious effects which would weaken the shaft and detract from its appearance. Also it has been found that such a shaft can be decorated in any variety of patterns by applying a selected color dye to the anodized surface and sealed. The shaft is then finally decorated by removing portions of its surface by cutting, grinding, or other machining which removes the surface in certain areas along the shaft to a depth to expose the aluminum color of the tubing. The color contrast between the exposed aluminum portions and the dyed portions of the shaft can be so arranged to present a number of different designs along the shaft. Moreover, the anodizing insulates the aluminum surface against the passage of electricity.

When the baton is twirled a series of concentric circles alternating between the colors of the exposed aluminum portions and the dyed portions of the shaft. These circles are not provided in the central portion of the shaft to provide the person twirling the baton with a visible reminder grip. This reminder grip shows the person where to catch the baton after throwing it with an upward twirling motion. The alternate concentric circles of bright exposed aluminum and colored dyed portion of the shaft also give the viewer the illusion of a twirling speed greater than the actual speed of the baton.

Weights are also provided at both ends of the shaft to provide for better balance of the baton as it is twirled. Each of the ends also has a ball or a tip thereon having lobes about the periphery thereof to minimize rolling of the baton on a surface.

Referring to the drawings, FIG. 1 discloses schematically the preferred operations employed in making the baton and FIG. 2 discloses a baton made in accordance with the method illustrated in FIG. 1.

To make the baton shaft, aluminum stock of the proper gauge and diameter is cut to the desired length

at an initial station indicated generally as **10** in FIG. **1.** Tubular aluminum stock is available in various gauges and diameters and the appropriate stock is selected according to the type of baton desired. Any suitable cutting mechanism such as a saw or the like may be employed to cut the tubular stock into the desired length. The shafts are then cleaned, and burrs and nicks removed therefrom.

The baton shafts are prepared for anodizing by first immersing them into a bright dip solution at station **12.** Any suitable commercially available brightener solution may be employed which cleans and brightens the aluminum shaft. From the station **12,** the shafts are rinsed in water at rinse station **14** to remove any of the remaining bright dip solution therefrom. The shafts are then subsequently rinsed in a nitric acid rinse at station **16** and in another water rinse at station **18.**

At this stage the shaft has been properly prepared for anodizing. The shaft is anodized in the usual manner in a sulphuric acid bath at station **20.** The anodizing deposits a protective oxide film on the aluminum which provides a good surface for receiving a dye to be subsequently applied thereto and protecting the aluminum shaft.

After the shaft has been anodized the required extent, it is rinsed in water at station **22** and immersed in a heated dye solution at station **24.** The bath of the dye solution is provided in accordance with the desired coloring of the shaft and the shafts can be colored red, blue, black, etc., for example, to match or contrast with band majorettes' uniforms with which the batons will be used.

After the shaft has been dyed in the heated dye solution, it is subjected to a water rinse at station **26** and a nickel acetate sealer is applied to the shaft at station **28** to seal the surface. When the shaft is sealed, it is rinsed in a water rinse at station **30.**

The steps described heretofore provide a hard surface, colored aluminum anodized shaft which has been appropriately sealed to prevent corrosion or other deleterious effects. These shafts have an extremely smooth surface with a high luster, and may be readily cleaned.

The shafts are further decorated by forming designs on the shaft at station **32.** The designs are formed by removing portions of the shaft surface to a depth which removes all the dye so that the aluminum shows. The surface can be removed by milling, drilling, routing, or grinding with the use of special jigs, fixtures, and equipment. The design is formed by removing the dyed surface in a pre-arranged pattern so that the resulting exposed aluminum contrasts with the dyed surface of the shaft and forms the design. More specifically, the dyed aluminum shaft is supported adjacent a tool, such as a grinding, milling, drilling, or cutting tool, and the shaft and tool are relatively moved to remove the portions of the surface of the shaft necessary to form the desired design. Various types of designs can be applied to the surface.

The decorated shaft is then moved to an assembly station **34** where weighted members such as rivets, screws, plugs, etc. are staked in the ends of the shaft. The weighted members function to provide abutments for holding the rubber ball and tip in assembled relation on the ends of the shaft. Also, by selecting the particular weight of rivet the shaft can be readily balanced for better twirling capability. The final step in making the baton is assembling the rubber ball and tip on the ends of the shaft at station **36.**

A baton formed in accordance with the described method can take the form of the baton **38** shown in FIG. **2.** The baton **38** has a design formed by cutting or grinding circular grooves **40** or rings along each end of the shaft in a symmetrical pattern. The central portion **42** of the shaft has no grooves cut therein and is of sufficient length to be readily gripped for twirling purposes.

The grooves **40** are cut to a depth sufficient to remove all the dye and protective oxide film formed on the shaft by the anodizing process. The grooves **40** are of an aluminum color which contrasts with the adjacent surface portion **44** which is colored in accordance with the color of the dye solution at station **24** and has a high luster and glitter. The high luster surface portion and the contrasting aluminum rings provide a highly decorative effect.

By selecting different colors of dyes, and forming different shapes of grooves, various design effects can be achieved. The grooves **40** and contrasting colored surface portion **44** have different light reflecting characteristics so that when the baton is twirled the illusion of a series of concentric rings is achieved giving the baton an illusion of being twirled at high speeds. Other designs may give other illusions but because of the glitter of the aluminum surface portions and the high luster of the contrasting dyed portions the baton when twirled gives the illusion of great speed.

The illusion of a series of concentric rings also provides a reminder grip for the person using the baton. When the baton is twirled and thrown upwardly it is important that the person twirling the baton grasp the baton as close to the rotational center of the baton as possible so that he may continue to twirl the baton. By providing an illusion of a series of concentric rings, the person using the baton may attempt to grasp the baton in the center of the rings and thereby grasp the baton about its center of rotation and continue to rotate the baton. This center where concentric rings do not exist is commonly known as the reminder grip.

A second embodiment of the baton of the present invention is shown in FIGS. **3–6.** For ease of description, common reference numerals will be used for common parts with the suffix *a* appended thereto.

The baton **38***a* shown in FIG. **3** has a design on the aluminum shaft **46** formed by cutting or grinding circular grooves **40***a* or rings along each end of the shaft in a symmetrical pattern. A central portion **42***a* of the shaft has no grooves cut therein and is adapted to be readily gripped for twirling purposes. The aluminum shaft **46** has a uniform internal diameter through its length.

To provide for additional strength of the aluminum shaft **46,** a steel tube **50** is provided having a substantially uniform external diameter **52.** The external diameter **52** and internal diameter **48** have corresponding magnitudes so that the steel tube **50** reinforces the aluminum shaft **46.**

In order for the steel member **50** to provide for support of the aluminum tube **46,** the outside diameter **52** is substantially the same as the diameter **48** of the aluminum tube **46.** A suitable epoxy (not shown) is located between the outer diameter **52** of the member **50** and the inner diameter **48** of the tube **46** to prevent relative rotation therebetween.

As mentioned hereinabove, the steel member **50** inside of the aluminum tube **46** provides the additional strength which is sometimes desirable in the baton **38***a* when extreme forces are exerted thereon. It should be understood that the internal steel member **50** does not change the advantageous features of the dyed aluminum shaft but rather adds to the strength of the shaft. It should also be understood that when a shaft is required having greater strength, the thickness of the steel member **50** may be increased until it is a solid rod having no internal diameter.

On each of the ends of the baton **38***a*, the weighted members **54, 56** are provided. As will be hereinafter described, these weighted members **54, 56** are of different magnitudes and serve to balance the baton **38***a* so that it rotates about its geometric center. The weighted member **54** is positioned on one end of the shaft while the weighted member **56** is positioned on the other end of the shaft. The rubber ball **58** is positioned on the one end of the shaft while the tip **60** is positioned on the corresponding other end of the shaft.

For ease of description, only the weighted member **54** will be hereinafter described. It should be understood that the weighted member **56** on the other end of the shaft is similar in construction.

As seen in FIG. **4**, the weighted member **54** has a head portion **62** having an opening **64** therein. The opening **64** extends to the treaded opening **66** so that a treaded fastener **76** may be received in the treaded opening through the opening **64**. The head **62** extends downwardly to a supporting surface **68** as seen in FIG. **3**. The ends of the aluminum tube **46** and steel member **50** receive the side portions **70** of the expanding portion **71** until they contact the surface **68**. The surface **70** is in contact with the internal diameter of the steel tube **50**. It should be understood that if the steel member **50** is designed to terminate short of the end of the shaft, the surface **70** is received by the internal diameter **48** of the aluminum tube **46**.

The treaded opening **66** has a tapered configuration so as to allow for expanding of the portion **71** against the shaft as will be hereinafter described. Slot **72** is provided in the expanding portion **71** of the weighted member **54**. The slot **72** allows the surface **70** to expand as the treaded member **76** as shown in FIG. **3** is treaded into the treaded opening **66**. As the surface **70** expands, it grips the inside of the steel member **50** and thereby secures the weighted member **54** to the shaft. The slot **72** also allows air to escape from the center of the shaft.

To secure the ball **58** to the shaft, the surface **68** extends from the end of the shaft. When the rubber ball **58** is forced over the rounded corners **76** and consequently onto the one end of the shaft, the surface **78** of the ball member **58** engages a portion of the surface **68**. The ball **58** is retained on the weighted member **54** by the locking action of the surface **68** and **78**.

It should be understood that the weighted member **56** is secured to the other end of the shaft in a manner similar to that hereinabove described. It should also be understood that the weighted member **56** is heavier than the weighted member **54** to compensate in the difference between the weight of the ball **58** and the weight of the tip **60**. Thus, each end of the shaft is equally weighted. By so compensating for the weights of the ball and tip **58, 60** respectively the baton is balanced about the geometric center of the baton and may be twirled about the geometric center. Since the baton rotates about its geometric center a series of concentric rings are visible by rotation of the grooves **40***a* and dyed portion **44***a* of the baton about a common axis.

By providing a balanced shaft with the weighted members **54, 56** the baton **38***a* not eccentric and may easily be rotated about the geometric center. This allows the user of the baton to twirl it with greater ease since the center is not consequently changing as it would be if the baton were eccentrically weighted.

To decrease the tendency of the baton to roll, the ball **58** has a plurality of lobes **80** as seen in FIG. **5** positioned about the outer periphery and the tip **60** has a plurality of lobes **82** positioned about its periphery, as seen in FIG. **6**. The number of lobes **80** on the ball **58** are sufficient to reduce the tendency of the baton to roll, yet not so numerous as to act as a circular surface. As seen in FIG. **5**, the ball **58** has a greater diameter and therefore needs more lobes **80** than the tip **60** which has a smaller diameter. Thus, the number of lobes on the ball **58** or tip **60** is directly dependent on the size of the ball **58** or tip **60**.

When the baton is twirled and accidently dropped, it is imporant that the user of the baton to pick up the baton quickly if he should drop the baton. The lobes **80, 82** reduce the tendency of the baton to roll and allows the user of the baton to quickly find the baton and begin to use it again.

The present invention provides a baton shaft constructed from aluminum tubing which is anodized and dyed a desired color. Portions of the dyed surface are then removed to expose the aluminum which contrasts with the dyed surface portion and forms a design of the shaft. Weights **54, 56** are provided to balance the shaft and a ball **58** and a tip **60** with lobes **80, 82** respectively, are provided to reduce rolling of the baton when dropped. To provide further reinforcement of the aluminum tubing, a steel member **50** is engaged by the internal surface **48** of the aluminum tube **46**.

What is claimed is:

1. A baton comprising a lightweight corrosion-resistant tubular shaft, a ball carried on one end of said shaft, two weighting members, one of which is secured in each open end of said tubular shaft, each of said members having a predetermined weight to balance said shaft for twirling, a tip carried on the other end of said shaft, said tubular shaft having a central portion providing an area to be gripped for twirling and first and second end portions extending integrally from said central portion and carrying said ball and tip respectively, said portions being made of dyed anodized aluminum material and having a smooth easily cleaned high luster outer surface, said first and second end portions having grooves therein symmetrically arranged relative to said central portion, said central portion being free of grooves, each of said grooves extending to a depth greater than that of the dyeing and anodizing and exposing the bare aluminum material of the shaft which contrasts with the dyed anodized surface area of high luster, each of said grooves having a bottom surface of non-anodized aluminum material located diametrically inwardly relative to the outer anodized dyed surface of the baton shaft, whereby upon twirling, the baton exhibits circular paths of travel of the grooves that indicate the location of the center of the baton, and wherein said lightweight corrosion-resistant tubular shaft includes an outer aluminum tubular member

defining the outer surface of said shaft and a steel member received by said outer aluminum tubular member to reinforce said outer aluminum tubular member, said aluminum member having a uniform internal diameter throughout the length of said aluminum member, said steel member having an outer diameter corresponding to the internal diameter of said aluminum tubular member and being coextensive with said aluminum member to reinforce said aluminum member throughout the entire length thereof including said central portion.

2. A baton comprising a shaft, a ball carried on one end of said shaft, a tip carried on the other end of said shaft, said shaft having a central portion providing an area to be gripped for twirling and first and second end portions extending from said central portion and carrying said ball and tip respectively, said shaft having an outer aluminum tubular member defining the outer surface of said shaft and a steel member inside of said outer aluminum tubular member, said first and second portions of said outer surface of said outer aluminum tubular member having a dyed anodized finish defining a smooth easily cleaned high luster outer surface, said first and second portions having grooves therein symmetrically arranged relative to said central portion and extending to a depth greater than that of the dyeing and anodizing and exposing the glittering aluminum material of the shaft which contrasts with the dyed anodized surface areas of high luster, said central portion being free of grooves, said aluminum tubular member having a uniform internal diameter throughout the length of said aluminum member, said steel member having an outer diameter corresponding to the internal diameter of said aluminum member and being coextensive with said aluminum member to reinforce said aluminum member not only at said end portions but throughout said central portion also.

3. A baton as defined in claim **2** and further comprising members having preselected weights secured to the opposite ends of said shaft to balance said shaft for twirling, each of said weighted members including a retaining surface and each of said ball and said tip including a complementary retaining surface corresponding to and engaging the retaining surfaces of said weighted members so that said ball and said tip are retained on said shaft by said retaining surfaces.

4. A baton as defined in claim **3** and wherein said steel member is tubular and includes an opening at each end thereof, said weighted members including an expanding section received by the openings in the ends of said steel member, said expanding section being expandable to secure said weighted member to said steel member.

5. A baton as defined in claim **2** and wherein each of said ball and said tip have a plurality of lobes distributed about the periphery thereof to reduce the tendency of said baton to roll on a surface, each of said lobes being of rounded shape at its outer extremity to preclude erratic bouncing in unpredictable directions upon dropping of the baton on a surface.

6. A baton comprising a lightweight shaft made of material having a smooth high luster outer surface and having a central portion providing an area to be gripped for twirling and first and second end portions extending from said central portion, said first and second portions having grooves therein symmetrically arranged relative to said central portion for describing circular paths of travel which visually indicate the location of the center of the baton during twirling, said central portion being free of grooves, a ball formed from rubber and carried on one end of said shaft, and a tip formed from rubber and carried on the other end of said shaft, said ball and said tip having six lobes and four lobes respectively distributed about the peripheries thereof to reduce the tendency of the baton to roll on a surface, each of said lobes having a spherical end.

7. A baton comprising a lightweight corrosion-resistant shaft made of dyed anodized aluminum material and having a smooth high luster outer surface and having a central portion providing an area to be gripped for twirling and first and second end portions extending from said central portion, said first and second portions having grooves therein symmetrically arranged relative to said central portion for describing circular paths of travel which visually indicate the location of the center of the baton during twirling, said grooves extending to a depth greater than that of the dyeing and anodizing and exposing a bottom surface in the grooves of non-anodized aluminum material, said central portion being free of grooves, a ball formed from an elastomeric material and carried on one end of said shaft, and a tip formed from elastomeric material and carried on the other end of said shaft, said ball and said tip each having a plurality of lobes distributed about the periphery thereof to reduce the tendency of the baton to roll on a surface, each of said lobes having a rounded unpointed end, and wherein said lightweight corrosion-resistant shaft includes an outer aluminum tubular member defining the outer surface of said shaft and a steel member inside of said outer aluminum tubular member to reinforce said outer aluminum tubular member, said aluminum tubular member having a uniform internal diameter throughout the length of said aluminum member, said steel member having an outer diameter corresponding to the internal diameter of said aluminum member and reinforcing said aluminum member throughout the length of said aluminum member including the central portion thereof.

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