**Chalkless Pool Cue Tip**

**Field of Invention**

1. This disclosure relates to a pool cue tip and a pool cue comprising the same.

**Background**

1. A pool cue stick, or cue, typically comprises a shaft, a ferrule, and a tip. The tips are conventionally felt or leather. Such tips require chalk in order to optimally grip the cue ball upon impact. However, chalk can create dust which can cause a buildup on pool tables. Further, conventional pool cue tips (e.g., leather) can wear out and become misshaped over time requiring maintenance. These and other shortcomings are overcome by the disclosure herein.

**Summary**

1. Described herein are a pool cue tip and a pool cue comprising the same. According to a first aspect, a pool cue tip can include a generally cylindrical portion having a first end, a second end, a diameter, and an axis. A spherical cap portion can extend from the second end of the generally cylindrical portion. The spherical cap portion can be axially centered about the axis of the generally cylindrical portion and meet the generally cylindrical portion at a base. The base can have a diameter that is less than the diameter of the generally cylindrical portion so that the second end of the generally cylindrical portion defines a generally planar annular lip having a major diameter and a minor diameter.
2. According to a second aspect, a pool cue can include a shaft, a ferrule coupled to the shaft at a first end, and a cue tip coupled to the ferrule and an end of the ferrule opposite the shaft. The pool cue tip can include a generally cylindrical portion having a first end, a second end, a diameter, and an axis. A spherical cap portion can extend from the second end of the generally cylindrical portion. The spherical cap portion can be axially centered about the axis of the generally cylindrical portion and meet the generally cylindrical portion at a base. The base can have a diameter that is less than the diameter of the generally cylindrical portion so that the second end of the generally cylindrical portion defines a generally planar annular lip having a major diameter and a minor diameter.
3. According to a third aspect, a pool cue tip can comprise a generally cylindrical portion having a first end, a second end, a diameter, and an axis. A spherical cap portion can extend from the second end of the generally cylindrical portion. The spherical cap portion can be axially centered about the axis of the generally cylindrical portion and meet the generally cylindrical portion at a base. The cue tip can comprise a polymeric material that has a tackiness that is greater without a chalk coating than with a chalk coating so that chalk is not require for using the cue tip.
4. Additional advantages of the invention will be set forth in part in the description which follows, and in part, will be obvious from the description or may be learned by practice of the invention. The advantages of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims. It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

**Detailed Description of Figures**

1. These and other features of the preferred embodiments of the invention will become more apparent in the detailed description in which reference is made to the appended drawings wherein:
2. FIG. 1 a pool cue comprising a pool cue tip in accordance with disclosed embodiments;
3. FIG. 2 is a perspective view of the pool cue tip as in Figure 1;
4. FIG. 3 is a side view of the pool cue tip as in Figure 2; and
5. FIG. 4 is a top view of the pool cue tip as in Figure 2.

**Detailed Description**

1. The present disclosure can be understood more readily by reference to the following detailed description, examples, drawings, and claims, and their previous and following description. However, before the present devices, systems, and/or methods are disclosed and described, it is to be understood that this disclosure is not limited to the specific devices, systems, and/or methods disclosed unless otherwise specified as such can, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular aspects only and is not intended to be limiting.
2. The following description is provided as an enabling teaching of the disclosed articles, systems, and methods in their best, currently known embodiments. To this end, those skilled in the relevant art will recognize and appreciate that many changes can be made to the various aspects of the articles, systems, and methods described herein, while still obtaining the beneficial results of the disclosure. It will also be apparent that some of the desired benefits of the present disclosure can be obtained by selecting some of the features of the present disclosure without utilizing other features or combining some features of one embodiment with features of another embodiment. Accordingly, those who work in the art will recognize that many modifications and adaptations to the present disclosure are possible and can even be desirable in certain circumstances and are a part of the present disclosure. Thus, the following description is provided as illustrative of the principles of the present disclosure and not in limitation thereof.
3. As used throughout, the singular forms “a,” “an” and “the” include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to “a surface” can include two or more such surfaces unless the context indicates otherwise.
4. Ranges can be expressed herein as from “about” one particular value, and/or to “about” another particular value. When such a range is expressed, another aspect includes from the one particular value and/or to the other particular value. Similarly, when values are expressed as approximations, by use of the antecedent “about,” it will be understood that the particular value forms another aspect. It will be further understood that the endpoints of each of the ranges are significant both in relation to the other endpoint, and independently of the other endpoint.
5. As used herein, the terms “optional” or “optionally” mean that the subsequently described event or circumstance may or may not occur, and that the description includes instances where said event or circumstance occurs and instances where it does not.
6. The word “or” as used herein means any one member of a particular list and also includes any combination of members of that list.
7. **FIG. 1** illustrates a pool cue 100. The pool cue **100** can comprise a generally frustoconical shaft **102** that is tapered from a butt end **104** to a tip end **106**. In some embodiments, the shaft **102** can comprise a first segment and a second segment. For example, the shaft 102 can be broken down into the first segment and second segment to make travelling with the pool cue 100 easier. The shaft **102** can couple to a ferrule **110** via adhesive or screw coupling. The adhesive can be any type of adhesive such as glue, super glue, rubber cement, etc. The ferrule **110** can comprise any material such as plastic, carbon fiber, wood, etc. The ferrule **110** can comprise a cylindrical or frustoconical recess that receives the tip end **106** of the shaft **102**. The ferrule **110** can have female threads that receive a threaded rod comprising male screw threads extending from the shaft **102**. A cue tip **200** can couple at an end of the ferrule **110** opposite the shaft **102**. The cue tip **200** can couple to the ferrule 110 via adhesive. The adhesive can be any type of adhesive such as glue, super glue, rubber cement, etc. In further embodiments, the cue tip **200** can comprise a threaded rod comprising male screw threads extending therefrom that is received into female threads in the ferrule **110**.
8. **FIG. 2** illustrates a perspective view of the cue tip 200. As shown, the cue tip 200 can have a spherical cap 220 that extends from a cylindrical portion 210. The cue tip 200 also has an annular lip 230. Pool cue tips can come in various sizes. Typical sizes are a thirteen millimeter diameter cue tip, a 12.5 millimeter diameter cue tip, a 12.75 millimeter and a 11.75 millimeter diameter cue tip and a 9 millimeter tip. As will be appreciated by one skilled in the art, the cue tip 200 can comprise any of these diameters, as well as additional diameters. The cylindrical portion **210** can have an axial height of about six millimeters. In further embodiments, the cylindrical portion **210** can have an axial height of about four millimeters, about six millimeters, or about 8 millimeters.
9. **FIG. 3** illustrates side view of the cue tip **200**. The cue tip **200** can include a generally cylindrical portion **210** having a first end **212**, a second end **214**, a central axis **216**, and a diameter **218**. The cue tip **200** can further comprise a spherical cap **220** axially centered at the second end **214** of the cylindrical portion **210**. The spherical cap **220** can have a base **222** (e.g., a circular area at which the spherical cap **220** meets the cylindrical portion **210**) with a diameter **224** that is less than the diameter **218** of the generally cylindrical portion **210** so that the second end **214** of the cylindrical portion **210** defines an annular lip **230**. The annular lip **230** can be generally planar in a plane perpendicular to the central axis **216** of the cylindrical portion **210**.
10. Pool cue tips can come in various sizes. Typical sizes are a thirteen millimeter diameter cue tip, a 12.5 millimeter diameter cue tip, and a 11.75 millimeter diameter cue tip. For one embodiment of a thirteen millimeter diameter cue tip 200, the diameter 218 of the cylindrical portion 210 can be about thirteen millimeters. The diameter 224 of the spherical cap’s base 222 can be approximately twelve millimeters. Accordingly, the annular lip 230 can extend radially one half millimeter from the spherical cap 220.
11. For various pool cue tip diameters (i.e., the diameter 218 of the cylindrical portion 210), the diameter 224 of the base 222 can be selected in order to provide a lip having a major diameter (i.e. the diameter 218 of the cylindrical portion 210) and a minor diameter (i.e. the diameter 224 of the base 222). In some embodiments, the annular lip 230 can have a major diameter and a minor diameter that differ by between 0.8 millimeters and 1.2 millimeters. In further embodiments, the difference between the major diameter and the minor diameter can be between one millimeter and two millimeters. Accordingly, the annular lip 230 can extend radially up to one millimeter from the spherical cap 220. In yet further embodiments, the difference the major diameter and the minor diameter can be between two millimeters and three millimeters. Accordingly, the annular lip 230 can extend radially up to 1.5 millimeters from the spherical cap 220.
12. The surface of the spherical cap 220 can have a radius 226 of about 8.95 millimeters. The spherical cap 220 can, therefore, extend axially about 2.28 millimeters from the cylindrical portion 210. In further embodiments, the radius 226 of the spherical cap 220 can be about seven millimeters, about eight millimeters, about nine millimeters, about ten millimeters, or about twelve millimeters. The spherical cap 220 can, therefore, extend axially about 1.8 millimeters, about two millimeters, about 2.2 millimeters, about 2.4 millimeters, or about 2.6 millimeters from the cylindrical portion 210. Further, the spherical cap 220 can have a height of about 8 millimeters. The spherical cap 220 can have a height from about 2 millimeters to 20 millimeters.
13. It should be understood that edges of the cue tip 200 can include radii (e.g., a radius of 0.1 millimeters) and need not have sharp corners. Therefore, for example, the cylindrical portion 210 can have rounded edges at its first and second ends 212, 214.
14. The annular lip 230 can reduce the negative impacts of accidentally miscues. That is, as the cue tip impacts the cue ball, if the cue tip is unintentionally misaligned with the cue ball, the annular lip 230 can catch the cue ball and propel the cue ball in a direction that is closer to a desired direction than a cue tip without the annular lip. Therefore, the lip enables the cue tip to be more forgiving than a cue tip without such an annular lip and improves the quality of the miscues.
15. The cue tip 200 can be unitarily formed via injection molding. The cue tip can comprise a polymeric material. A suitable polymeric material can include COVESTRO DESMOPAN 5377A, COVESTRO TEXIN 1209, COVESTRO DP 07-1199, or COVESTRO DO 6064.  According to one aspect, the polymeric material can be resilient. In some embodiments, the material can have a rebound resilience of 45% according to ISO 4662. The material can have a shore D hardness of about twenty-seven to about twenty-eight. According to one aspect, the material can have a shore A hardness of about sixty-seven to about seventy-seven.
16. One benefit of providing a polymeric cue tip with these characteristics is that the cue tip does not wear in the way traditional leather cue tips wear. Traditional cue tips wear down under repeated use and plastically deform to become flattened and uneven. Leather tips must, therefore, be periodically reshaped in order to provide the desired rounded surface curvature. According to one aspect, cue tip 200 can be configured for a greater lifetime than traditional cue tips. The combination of hardness and resiliency allow the cue tip 200 to retain its original shape, thereby improving the lifetime of the cue tip 200 and eliminating the requirement for such routine reshaping.
17. According to another aspect, the polymeric material can have a tacky surface that grips the cue ball upon impact. Conventional cue tips require a chalk coating in order to have sufficient grip on the cue ball upon impact. Grip is necessary to prevent miscues when striking a pool ball. Further, grip allows for consistency between shots because even if the pool cue does not hit in the exact same area on the pool ball, the ball will behave in a predictable manner upon being struck. Additionally, grip is particularly important for putting “English” (e.g., a desired amount of spin) on the cue ball. In some embodiments, the un-chalked surface of the cue tip 200 can naturally (e.g., without chalk or another grip enhancing coating) have a tackiness that is at least as tacky as a chalked traditional leather pool cue tip. In this way, without chalk, the surface of the cue tip 200 can grip the surface of the ball to prevent slippage that would otherwise result in a miscue. Further, the cue tip 200 may have a surface that is tackier than a traditional leather pool cue tip when chalked to improve the grip that the cue tip 200 has upon impact with a pool ball. Accordingly, the cue tip 200 can be configured to be used without chalk while playing pool.
18. Although several embodiments of the invention have been disclosed in the foregoing specification, it is understood by those skilled in the art that many modifications and other embodiments of the invention will come to mind to which the invention pertains, having the benefit of the teaching presented in the foregoing description and associated drawings. It is thus understood that the invention is not limited to the specific embodiments disclosed hereinabove, and that many modifications and other embodiments are intended to be included within the scope of the appended claims. Moreover, although specific terms are employed herein, as well as in the claims which follow, they are used only in a generic and descriptive sense, and not for the purposes of limiting the described invention, nor the claims which follow.

## **Claims:**

What is claimed is:

1. A pool cue tip comprising:

 a generally cylindrical portion having a first end, a second end, a diameter, and an axis; and

 a spherical cap portion extending from the second end of the generally cylindrical portion, wherein the spherical cap portion is axially centered about the axis of the generally cylindrical portion and meets the generally cylindrical portion at a base,

 wherein the base has a diameter that is less than the diameter of the generally cylindrical portion so that the second end of the generally cylindrical portion defines a generally planar annular lip, having a major diameter and a minor diameter, that is configured to mitigate negative effects of a miscue.

2. The pool cue tip of claim 1, wherein the difference between the major diameter and the minor diameter of the annular lip is between 0.8 and 1.2 millimeters.

3. The pool cue tip of claim 2, wherein the difference between the major diameter and the minor diameter is about one millimeter.

4. The pool cue tip of claim 1, wherein the difference between the major diameter and the minor diameter of the annular lip is between one millimeter and two millimeters.

5. The pool cue tip of claim 1, wherein the spherical cap defines a spherical surface having a radius of about 9 millimeters.

6. The pool cue of claim 1, wherein the pool cue tip comprises a polymeric material.

7. The pool cue of claim 6, wherein the polymeric material is selected from the group consisting of: COVESTRO DESMOPAN 5377A, COVESTRO TEXIN 1209, COVESTRO DP 07-1199, or COVESTRO DO 6064.

8. The pool cue of claim 6, wherein the polymeric material has a shore A durometer of between sixty-seven and seventy-seven.

9. The pool cue of claim 6, wherein the polymeric material has a shore D durometer of between twenty-six and twenty-seven.

10. The pool cue of claim 6, wherein the polymeric material has a rebound resistance of about 45% according to the ISO standard 4662.

11. A pool cue comprising:

 a shaft;

 a ferrule coupled to the shaft at a first end; and

 a cue tip coupled to the ferrule and an end of the ferrule opposite the shaft, the cue tip comprising:

 a generally cylindrical portion having a first end, a second end, a diameter, and an axis, and

 a spherical cap portion extending from the second end of the generally cylindrical portion, wherein the spherical cap portion is axially centered about the axis of the generally cylindrical portion and meets the generally cylindrical portion at a base,

 wherein the base has a diameter that is less than the diameter of the generally cylindrical portion so that the second end of the generally cylindrical portion defines a generally planar annular lip, having a major diameter and a minor diameter, that is configured to mitigate negative effects of a miscue.

12. The pool cue tip of claim 11, wherein the difference between the major diameter and the minor diameter of the annular lip is between 0.8 and 1.2 millimeters.

13. The pool cue of claim 11, wherein the pool cue tip comprises a polymeric material.

 14. The pool cue of claim 13, wherein the polymeric material has a shore A durometer of between sixty-seven and seventy-seven.

15. The pool cue of claim 13, wherein the polymeric material has a shore D durometer of between twenty-six and twenty-seven.

16. The pool cue of claim 13, wherein the polymeric material has a rebound resistance of about 45% according to the ISO standard 4662.
17. A cue tip for a pool cue, the cue tip comprising:

 a generally cylindrical portion having a first end, a second end, a diameter, and an axis; and

 a spherical cap portion extending from the second end of the generally cylindrical portion, wherein the spherical cap portion is axially centered about the axis of the generally cylindrical portion and meets the generally cylindrical portion at a base,

 wherein the cue tip comprises a polymeric material that has a sufficient tackiness to provide grip to a pool ball.

18. The cue tip of claim 17, wherein the polymeric material is selected from the group consisting of: COVESTRO DESMOPAN 5377A, COVESTRO TEXIN 1209, COVESTRO DP 07-1199, or COVESTRO DO 6064.

19. The cue tip of claim 17, wherein the base has a diameter that is less than the diameter of the generally cylindrical portion so that the second end of the generally cylindrical portion defines a generally planar annular lip, having a major diameter and a minor diameter, that is configured to mitigate negative effects of a miscue.

20. The cue tip of claim 17, wherein the wherein the cue tip has a tackiness that is greater without a chalk coating than with a chalk coating.

**Abstract**

A pool cue tip comprises a generally cylindrical portion and a spherical cap portion that meets the generally cylindrical portion at a base. The base has a diameter that is less than a diameter of the generally cylindrical portion so that the generally cylindrical portion defines an annular lip. The pool cue tip can comprise a polymeric material. The polymeric material can have a tackiness that is greater without a layer of chalk than with a layer of chalk so that the pool cue tip can be used without chalk. A pool cue can comprise a pool cue tip including one or more of such aspects.