INTEGRAL BILLIARD CUE TIP AND BACKING MEMBER
6 Claims, 9 Drawing Figs.

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ABSTRACT: An integral billiard cue tip and backing member wherein the backing member is provided with one or more locking studs which are respectively fixed within one or more cavities in the tip. In forming the integral cue tip and backing member, at least one cavity is formed in the tip and a molten plastic is then injected into said cavity simultaneously while forming the backing member.
INTEGRAL BILLIARD CUE TIP AND BACKING MEMBER

BACKGROUND AND DESCRIPTION OF THE INVENTION

The present invention generally relates to an improved billiard cue tip and backing member and method of making the same. More particularly, this invention is concerned with a billiard cue tip and integral backing member securely fixed to each other without the use of adhesive bonding. Specifically, this invention is directed to an integral cue tip and backing member having one or more locking studs which cooperate with recesses formed in the cue tip to securely hold the backing member and cue tip in fixed abutting relationship to each other.

Numerous efforts have been made in the prior art to provide a billiard cue tip which is securely fixed to a ferrule or shaft and which can be easily replaced when worn. Until the present invention, none of these proposed solutions has met with complete success. For example, one technique for securing a cue tip to a shaft has involved the use of a pronged steel member which is split at its outer end with the prongs being received, presumably by a pressure fit, to the leather cue tip member. One serious disadvantage in this type of device is that as the leather of the cue tip wears out, the prong members will become exposed and come into contact with billiard balls, causing damage to them. Other solutions to the problem have involved the use of adhesives which are applied to the cue tip and ferrule or shaft. Where adhesives are used, it has been found that the cue tips on occasion become detached from the ferrule or shaft and that during replacement thereof the cue is out of service for a prolonged period of time, thereby necessitating, particularly in commercial establishments, the need for supplying a supply of extra cues on hand.

It is, therefore, an important object of the present invention to provide a new and improved billiard cue tip which is securely fixed to an integral backing member in a manner whereby accidental detachment of the cue tip from the backing member is virtually eliminated.

Another object of the present invention is to provide an improved integral cue tip and backing member which can be easily replaced on a ferrule adapted to receive the same.

Another object of the present invention is to provide a new and improved integral billiard cue tip and backing member wherein the cue tip preferably has at least three cavities formed therein which are angularly disposed to the longitudinal axis of the tip and in which a molten plastic material has been injected during the formation of the backing member so that the backing member is securely fixed to the cue tip in abutting relationship therewith.

Other and further objects of the present invention will be apparent from the following detailed description thereof taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a side elevational view of an integral cue tip and backing member made in accordance with the present invention;

FIG. 2 is a top plan view of the integral cue tip and backing member shown in FIG. 1 with portions thereof shown in section;

FIG. 3 is a sectional view of the integral cue tip and backing member shown in FIG. 2 taken along the line 3-3;

FIG. 4 is a sectional view of the stem of the integral cue tip and backing member shown in FIG. 1 taken along the line 4-4;

FIGS. 5-8 diagrammatically illustrate the various steps involved in making the integral cue tip and backing member 11 of the present invention. In particular, a cue tip blank 120 is first externally shaped through conventional techniques to provide said blank with a domed or rounded outer end face 18, a generally cylindrical body 17 and a bottom inner face 18. This process is diagrammatically illustrated in the sequence from FIG. 5 to FIG. 6.

Following external shaping, a plurality of cavities are formed in the cylindrical body portion 17 of the cue tip 12 by any suitable means, such as, for example, by driving a plurality of prongs (not illustrated) into bottom face 18 while a resisting force is applied to the end face 16 to prevent dislodging of tip 12 and enable the prong members to penetrate the body portion 17 to a predetermined depth. Each of the cavities 27, 28 and 29 are inclined with respect to the longitudinal axis of the cylindrical body portion 17 and terminate a predetermined distance below the outer surface 16a of domed portion 16 to provide sufficient material between the ends of the cavities and the outer surface so that a desirable amount of wear to said cue tip will occur before exposure of the locking studs is encountered.

In the molding operation, diagrammatically shown in FIG. 8, the apparatus generally includes a bottom steel die 33 having a cavity 34 formed therein. As is shown, the lower portion of die cavity 34 is provided with a curvilinear surface 34a generally corresponding to rounded surface 16a of cue tip 12. Likewise, the diameter of die cavity 34 is sized to accommodate cylindrical body portion 17 of the cue tip 12 with a snug fit such that upon the injection of molten material into the die cavity, extrusion or forming of a plastic material around the peripheral walls of body section 17 will be substantially avoided.
Following insertion of tip 12 into die cavity 34, a top die member 36 is placed over bottom die member 33. As is shown, top die member 36 is provided with a cavity 37 which is shaped in accordance with the configuration of stem 14 and preferably includes an inwardly extending annular shoulder 36a which produces a slight bevel or chamfer on bottom face 21 of backing member 13. Injection of molten plastic into the combined die cavities 34–37 is provided by means of a suitable inlet 38.

Preferably, each of the die members 33 and 36 is cooled by water or equivalent means to provide temperature control in the combined die cavities 34–37. In forming the backing member, the temperature in the die cavities should be sufficiently high to permit the plastic material injected into the die cavity to remain in a molten state for a sufficient period of time to penetrate completely the full depth of the cavities 27, 28 and 29 of tip 12. Likewise, the temperature maintained in the die cavity should be sufficiently cool to prevent any damage to the tip member by reason of the relatively hot molten plastic material.

Following injection of the molten plastic material and simultaneous forming of the backing member 12 and locking studs 30, 31 and 32, integral cue tip and backing member 11 can be removed from the combined die cavities 34–37. Suitable trimming and finishing to remove flashings or unwanted portions of plastic material can then be accomplished by known techniques.

As is best shown in FIG. 9, integral cue tip and backing member 11 is mounted onto a plastic ferrule 24. As is illustrated, stem 14 is received within a first bore 23 sized to snugly receive the serrations or fins 22. Downwardly disposed from first bore 23 is a coaxially disposed larger diameter bore 39 which, in the illustrated embodiment, is provided with a pair of beads or bands 40 and 21 that serve to secure the ferrule 24 to a reduced in diameter section 42 of cue shaft 43. In this regard, bands or beads 40 and 41 exert a greater binding or retaining force on wooden shaft 43 than ferrule 24 exerts on stem 14 of the backing member 13 to enable ready replacement of integral cue tip and backing member 11 when desired.

Other modifications and variations from the above-described preferred embodiment will be apparent to those skilled in this art without departing from the spirit and scope of this invention. Accordingly, the present invention is to be limited only by the scope of the appended claims.

1. An integral cue tip and backing member assembly comprising: a relatively resilient tip composed of leather and having a generally cylindrical body, an outer end face, an inner end face opposite said outer end face and at least one cavity formed in said tip body and opening onto said inner end face, said cavity extending into the body of said relatively resilient tip a predetermined distance and terminating a sufficient distance below the outer end face thereof so that a substantial amount of wear will occur to said relatively resilient tip before the terminal portion of said cavity is exposed; and, a relatively rigid plastic backing member having a generally cylindrical body with an outer circumferential dimension which is substantially equal to the outer circumferential dimension of said generally cylindrical tip body, said backing member including means at one end for detachably securing said tip and backing member assembly to the end of a billiard cue tip and an end surface at the other end which abuts said inner end face of said tip, at least one integral locking stud projecting from said end surface into said cavity, said integral locking stud having been molded within said cavity simultaneously with the molding of said backing member by injection of molten plastic which is maintained in a molten state for a sufficient period of time so as to penetrate the full depth of said cavity; whereby, said molten plastic has penetrated said cavity to form said backing member locking stud and conform to any irregularities and porous interstices in said cavity and tip end face so that, when cured, said plastic backing member is securely fixed to said tip with the inner end face of said tip and said end surface of said backing member in abutting relationship to each other.

2. The integral billiard cue tip and backing member assembly of claim 1 wherein said tip has at least three cavities formed therein, each of which opens onto said inner end face, and said plastic backing member has at least three locking studs projecting therefrom, each of said locking studs respectively being fixed in one of said cavities in cooperative relationship therewith for securely holding said inner end face of said tip and said backing member end surface in abutting relationship to each other.

3. The integral billiard cue tip and backing member assembly of claim 2 wherein said cavities are angularly disposed to the longitudinal axis of said generally cylindrical tip body.

4. A billiard cue comprising: a shaft, a ferrule secured at one end to said shaft by retaining means which provides a given retention force thereto, and an integral billiard cue tip and backing member assembly, said integral billiard cue tip and backing member assembly including a relatively resilient tip composed of leather and having a generally cylindrical body, an outer end face, an inner end face opposite said outer end face, at least one cavity formed in said tip body and opening onto said inner end face, said cavity extending into the body of said relatively resilient tip a predetermined distance and terminating a sufficient distance below the outer end face thereof so that a substantial amount of wear will occur to said relatively resilient tip before the terminal portion of said cavity is exposed, and a relatively rigid plastic backing member having a generally cylindrical body with an outer circumferential dimension of said generally cylindrical tip body, said backing member including means at one end for detachably securing said tip and backing member assembly to the opposite end of said ferrule, said means providing a retention force between said backing member and ferrule which is less than the retention force between said ferrule and shaft, and an end face which includes at least one integral locking stud projecting therefrom into said cavity in said tip, said integral locking stud having been molded within said cavity simultaneously with the molding of said backing member by the injection of molten plastic which is maintained in a molten state for a sufficient period of time so as to penetrate the full depth of said cavity; whereby, said molten plastic has penetrated said cavity to form said backing member locking stud and conform to any irregularities and porous interstices in said cavity and tip end face so that, when cured, said plastic backing member is securely fixed to said tip with the inner end face of said tip and said end surface of said backing member in abutting relationship to each other.

5. The billiard cue of claim 4 wherein said tip of said integral tip and backing member assembly has at least three cavities formed therein which each open onto said inner end face, and said plastic backing member has at least three integral locking studs projecting from said backing member end surface, each of said integral locking studs being respectively fixed in one of said cavities and cooperating therewith for securely holding said inner end face of said tip and said backing member end surface in abutting relationship to each other.

6. The cue of claim 5 wherein said cavities are angularly disposed with respect to the longitudinal axis of said tip body.