



US005518455A

# United States Patent [19]

[11] **Patent Number:** 5,518,455

**Costain et al.**

[45] **Date of Patent:** May 21, 1996

## [54] QUICK COUPLING CUE STICK

## FOREIGN PATENT DOCUMENTS

[75] Inventors: **Paul Costain**, 21 Wellesley Rd., Beverly, Mass. 01915; **Gary Fumarola**, Beverly, Mass.

8899	7/1885	United Kingdom .....	473/44
2191707	12/1987	United Kingdom .	
2219946	12/1989	United Kingdom .	
2226251	6/1990	United Kingdom .	
2246302	1/1992	United Kingdom .....	473/44

[73] Assignee: **Paul Costain**, Beverly, Mass.

## OTHER PUBLICATIONS

[21] Appl. No.: **260,588**

Drawing of coupling rod manufactured by Bender Cues for securing to one stick portion of a cue stick (Jul. 13, 1992).  
Drawing of a prior art cue stick portion having a coupling rod and joint collar (at least by 1985).

[22] Filed: **Jun. 16, 1994**

## Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 79,448, Jun. 18, 1993, abandoned.

*Primary Examiner*—Mark S. Graham  
*Attorney, Agent, or Firm*—Hamilton, Brook, Smith & Reynolds

[51] **Int. Cl.<sup>6</sup>** ..... **A63D 15/08**

[52] **U.S. Cl.** ..... **473/44**

[58] **Field of Search** ..... 473/44, 45

## [57] ABSTRACT

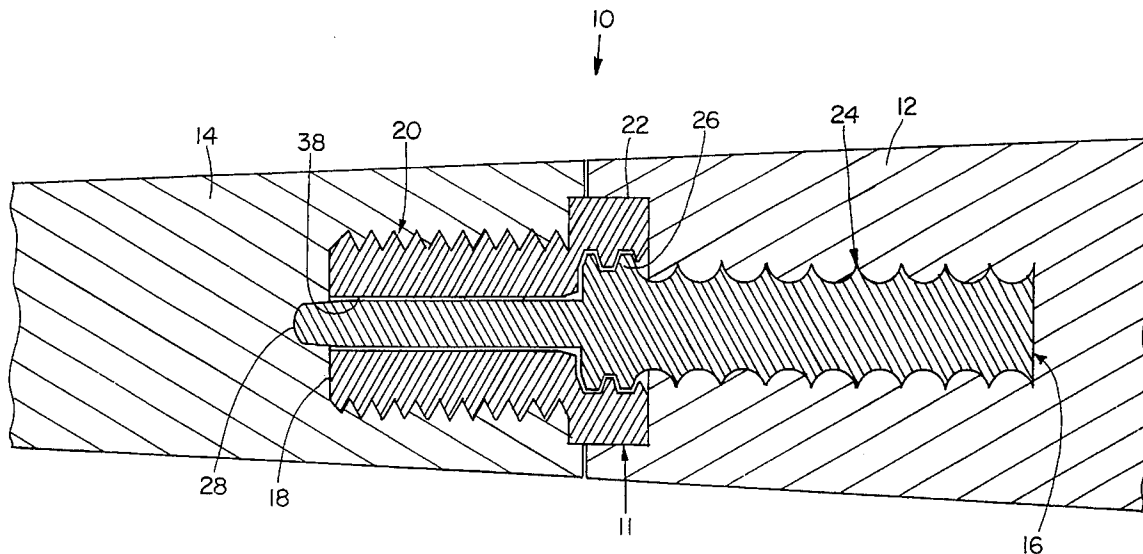
## [56] References Cited

### U.S. PATENT DOCUMENTS

248,681	10/1881	Walter .	
682,677	9/1901	Ferchland .	
970,172	9/1910	Bloom et al. .	
4,231,574	11/1980	Williams .....	273/68

A multiple piece cue stick includes multiple stick portions which are coupled together by a sleeve bushing secured to one stick portion and a coupling rod secured to another stick portion. The coupling rod has an elongate shaft which fits within a smooth bore of the sleeve bushing and is coupled to the sleeve bushing by engaging male threads of the coupling rod with female threads of the sleeve bushing.

**23 Claims, 5 Drawing Sheets**



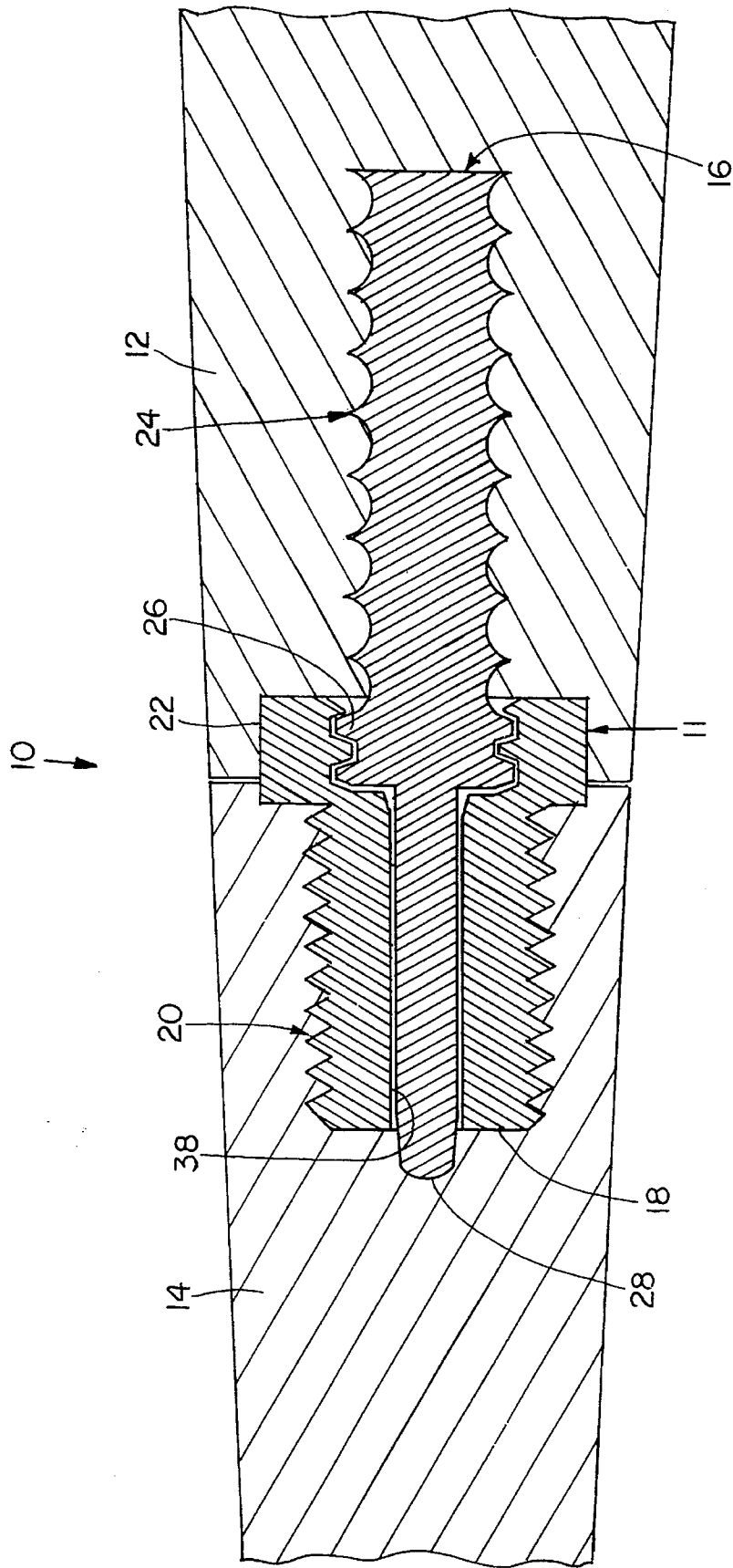


FIGURE 1

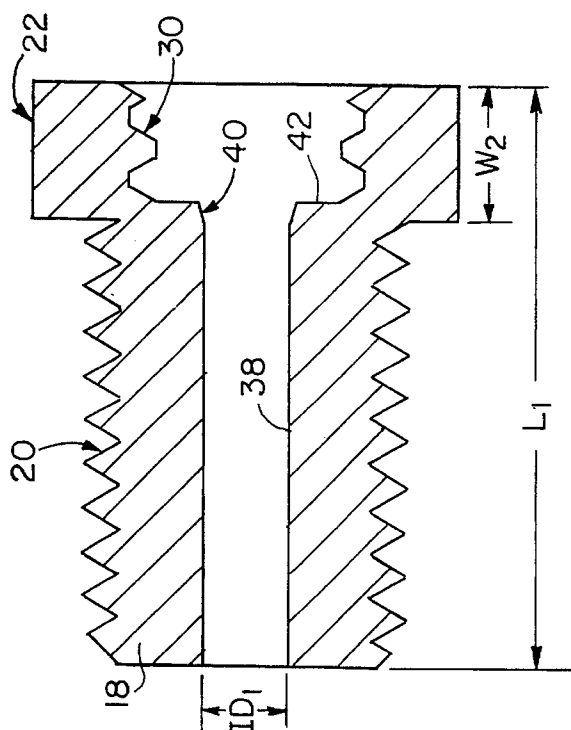


FIGURE 2

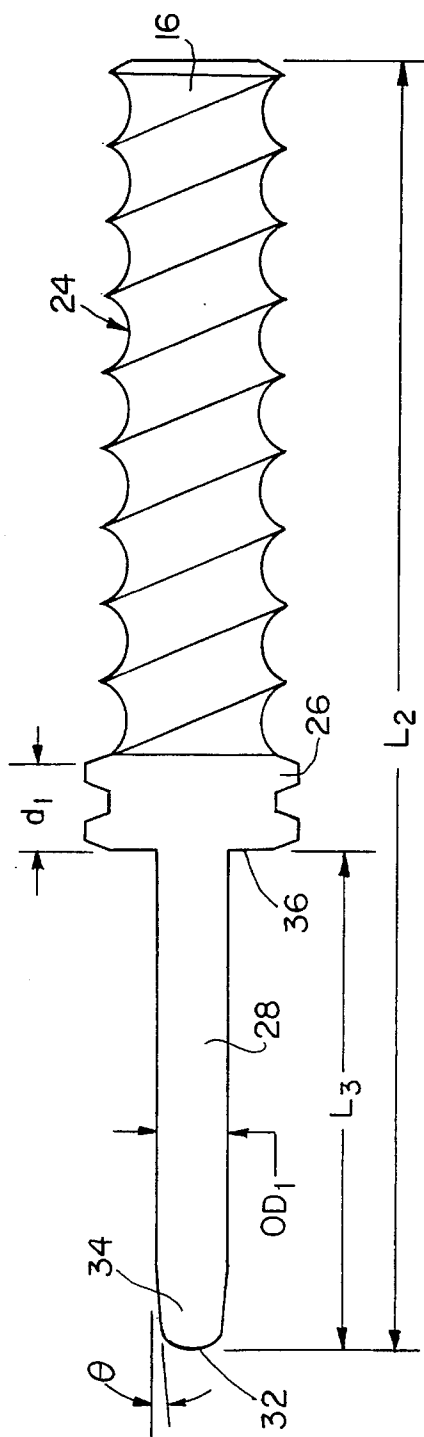
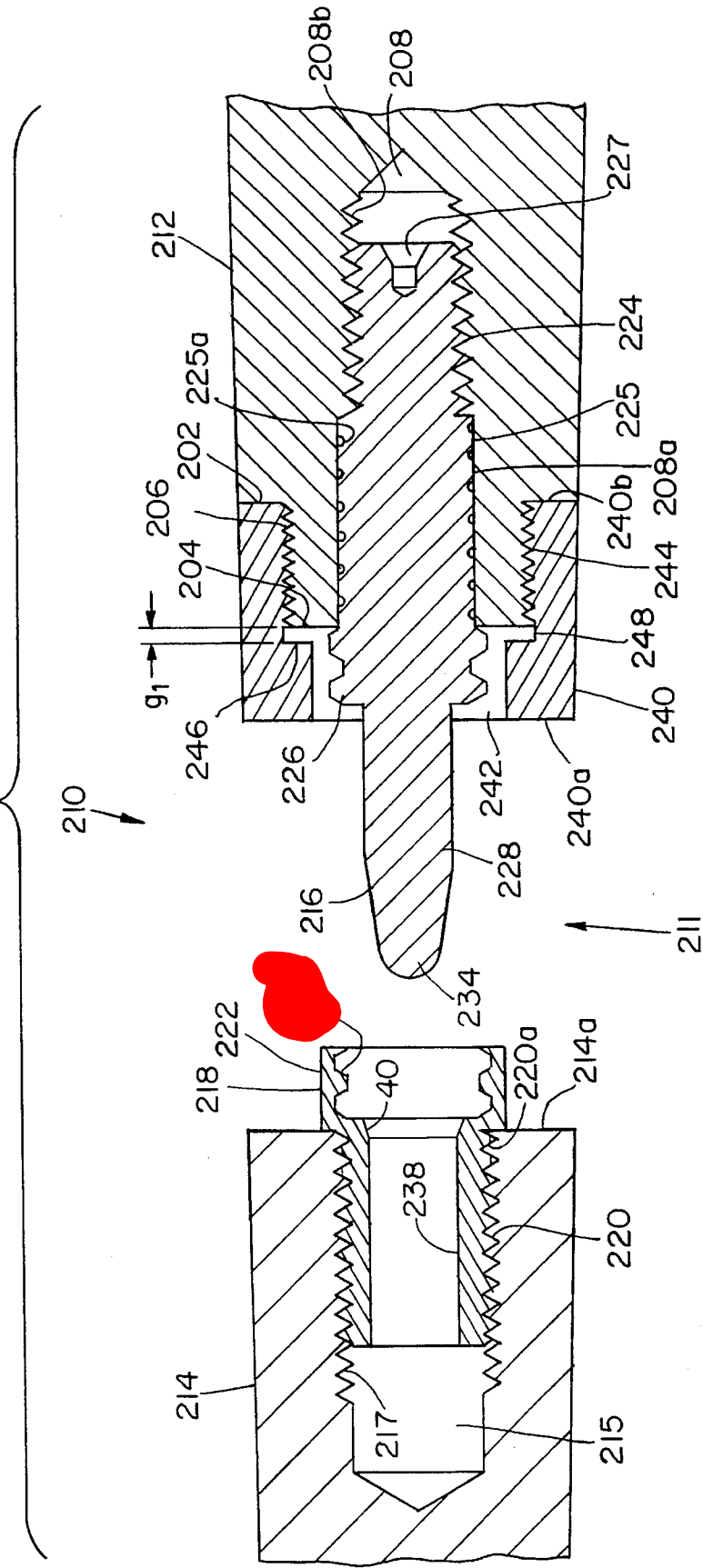


FIGURE 3



FIGURE 5



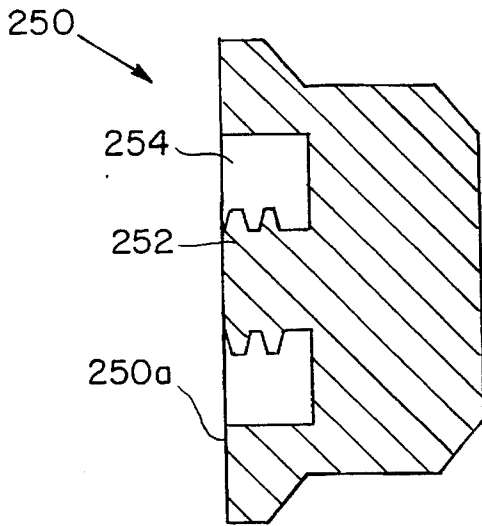


FIGURE 6

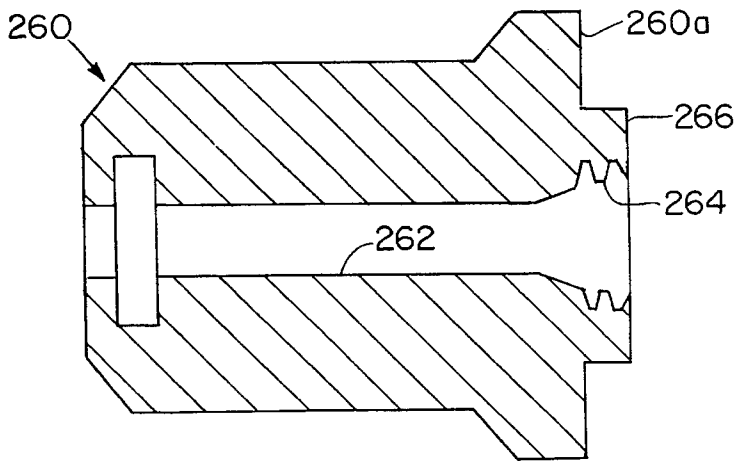


FIGURE 7

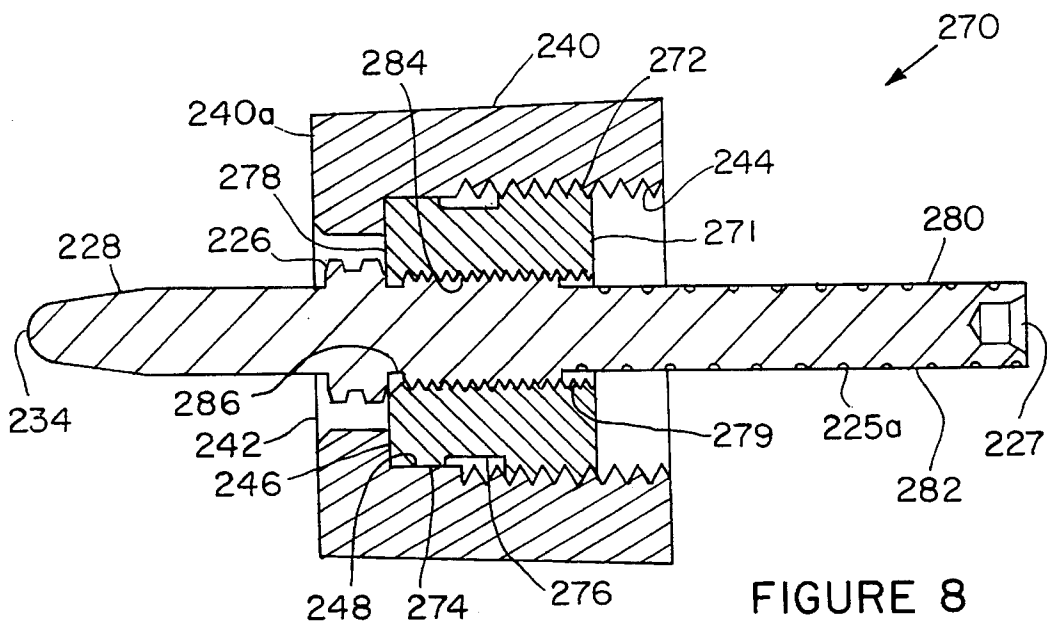


FIGURE 8

## QUICK COUPLING CUE STICK

### RELATED APPLICATION

This application is a continuation-in-part of U.S. patent application Ser. No. 08/079,488 filed on Jun. 18, 1993, now abandoned which is incorporated herein by reference.

### BACKGROUND

Multi-piece cue sticks for playing pool are generally two piece sticks which consist of a lower shaft portion and an upper butt portion which can be assembled together for use or disassembled for transportation. Traditionally, the shaft and the butt are joined together with a two-piece coupling. The coupling usually includes a bushing having a standard female thread secured within the lower shaft portion of the cue stick and a rod having a mating male thread secured within the upper butt portion of the cue stick. The two portions of the cue stick are joined together by screwing the male thread of the rod into the mating female thread of the bushing until the end of the shaft portion of the cue stick contacts the end of the butt portion of the cue stick.

### SUMMARY OF THE INVENTION

A problem with this type of coupling is that the two portions of the cue stick may not become concentric with each other when joined together. A non-concentric cue stick is undesirable because a non-concentric cue stick does not transfer energy to a pool ball as efficiently as a concentric stick and therefore, the pool ball is not hit as sharply. Additionally, assembling the cue stick together by screwing the threaded rod into the bushing is time consuming, therefore, making it unsuitable to disassemble the cue stick during a game for using only the shaft portion as a cue stick when there are space constraints or for jumping the cue ball.

Accordingly, there is a need for a multi-piece cue stick in which the various portions of the cue stick can be assembled together so that the pieces are concentric with each other. Furthermore, there is a need for the coupling of the multiple piece cue stick to be quickly engaged and disengaged so that the user can assemble and disassemble the cue stick quickly during a game.

The present invention provides a cue stick which includes a first stick portion coupled to a sleeve. The sleeve has a smooth inner diameter portion and a female coupling region. A second stick portion is coupled to a coupling rod. The coupling rod has a smooth, elongate tip which has a close fit with the smooth inner diameter of the sleeve and a male coupling region which engages the female coupling region of the sleeve for coupling the coupling rod to the sleeve.

In preferred embodiments, the female coupling region of the sleeve is an internal threaded region and the male coupling region of the coupling rod is a first external threaded region. The sleeve has an external threaded region for coupling the sleeve to the first stick portion. The coupling rod has a second external threaded region for coupling the coupling rod to the second stick portion.

In one preferred embodiment, the internal threaded region of the sleeve and the first external threaded region of the coupling rod are acme-type threads which are capable of being coupled together by twisting the sleeve and the coupling rod relative to each other.

The present invention provides a multi-piece cue stick which can be rapidly assembled and disassembled by twisting the various pieces relative to each other in one revolution

or less. Additionally, the two pieces are joined together concentric with each other which enables the pieces to transfer energy more efficiently, thereby, allowing the user to hit a pool ball more sharply. Furthermore, the quick assembly and disassembly feature of the present invention cue stick allows cue sticks of two or more pieces to be assembled and disassembled during a game.

### BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, features and advantages of the invention will be apparent from the following more particular description of preferred embodiments of the drawings in which like reference characters refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating the principles of the invention.

FIG. 1 is a sectional view of the present invention cue stick at the region where two portions of the cue stick are coupled together.

FIG. 2 is a sectional view of the sleeve bushing.

FIG. 3 is a side view of the coupling rod.

FIG. 4 is a sectional view of a sleeve bushing and a coupling rod of a preferred embodiment.

FIG. 5 is a side sectional view of another preferred embodiment of the present invention.

FIG. 6 is a side sectional view of a joint protector for protecting the sleeve bushing.

FIG. 7 is a side sectional view of a joint protector for protecting the coupling rod.

FIG. 8 is a side sectional view of a coupling rod/collar assembly.

### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1, 2 and 3, multi-piece cue stick **10** has a lower stick portion **14** and an upper stick portion **12** joined together by coupling **11**. Coupling **11** includes a sleeve bushing **18** and a coupling rod **16** which are coupled to stick portions **14** and **12** respectively.

Sleeve bushing **18** has a threaded region **20** and a smooth bore **38**. Sleeve bushing **18** is coupled to stick portion **14** by screwing and gluing the sleeve bushing **18** into stick portion **14**. Alternatively, sleeve bushing **18** and lower portion **14** can be coupled together by other suitable means. Coupling rod **16** has a smooth shaft region **28**, a threaded region **26** and a threaded region **24**. Coupling rod **16** is secured to stick portion **12** by screwing and gluing threaded region **24** into stick portion **12**.

Stick portions **14** and **12** are coupled together by inserting shaft **28** of coupling rod **16** into bore **38** of sleeve bushing **18** and twisting coupling rod **16** so that threaded regions **26** and **30** engage each other. Shaft **28** and bore **38** are in a close slip fit with each other and locate stick portions **14** and **12** concentric with each other within 0.0005 inches when threaded regions **26** and **30** are engaged. This allows energy to be transferred from upper stick portion **12** to lower stick portion **14** efficiently so that a pool ball can be hit sharply with cue stick **10**. Threaded regions **26** and **30** have a large lead angle and allow stick portions **14** and **12** to be coupled to each other between approximately ¼ to one revolution relative to each other. This permits the user of cue stick **10** to quickly assemble and disassemble cue stick **10** during a game. Furthermore, this makes it feasible to use cue sticks having more than two pieces in a game.

In a preferred embodiment, the external threaded region 20 of sleeve bushing 18 is a M12x1.75 3E4E type thread (FIG. 2). This provides sleeve bushing 18 with a large enough wall thickness to allow threaded region 30 to be a 0.360-11x0.160 inches deep stub acme thread. Inner diameter ID<sub>1</sub> of bore 38 is dimensioned to be in a slip fit with shaft 28 with a diameter of 0.2751 inches +0.0002/-0.0000. A chamfer 40 between threaded region 30 and bore 38 provides a smooth transition between threaded region 30 and bore 38. Chamfer 40 is 15°x0.060 inch chamfer. The length L<sub>1</sub> of sleeve bushing 18 is one inch. Additionally, the width W<sub>2</sub> of bushing head 22 is 0.130 inches wide while the diameter of bushing head 22 is 0.500 inches.

In a preferred embodiment, shaft 28 has an outer diameter OD<sub>1</sub> of 0.275 inches +0.000/-0.0002 (FIG. 3). The tip 34 of shaft 28 is angled at 5° for 0.250 inches and terminates at a radius 32. This allows shaft 28 to easily engage bore 38 of sleeve bushing 18 without damaging the parts. When coupling rod 16 engages sleeve bushing 18, shoulder 36 is tightened against shoulder 42. Shaft 28 has a length L<sub>3</sub> of one inch. Thread region 26 is a 0.360-11 stub acme-4G type thread which has a length d<sub>1</sub> of 0.180 inches. The stub acme thread allows up to ¼ to one full turn of engagement to tighten lower portion 14 to upper portion 12. Threaded region 24 has a diameter of 0.3125 inches +0.0005/-0.0005 with a 0.156 full radius between the threads and a lead to a sharp point. The total length L<sub>2</sub> of coupling rod 16 is preferably four inches long.

The slip fit between shaft 28 and bore 38 is shown to be -0.0001 loose to 0.0005 loose which achieves a maximum concentricity of 0.0005 between lower portion 14 and upper portion 12. However, the diameter OD<sub>1</sub> of shaft 28 and the inner diameter ID<sub>1</sub> of bore 38 can be dimensioned to be within only 0.001 inches of concentricity.

FIG. 4 depicts another preferred embodiment of the present invention in which a sleeve bushing 118 and a coupling rod 116 are used to couple stick portion 14 to stick portion 12. Sleeve bushing 118 is fastened to lower portion 14 by screwing threaded portion 120 into lower stick portion 14. Coupling rod 116 is secured to upper stick portion 12 by screwing and gluing threaded region 124 to upper stick portion 12.

In order to engage coupling rod 116 with sleeve bushing 118, shaft 128 is inserted into bore 138 and rotated to engage threaded region 144 with threaded region 130. The inner diameter ID<sub>2</sub> and outer diameter OD<sub>2</sub> are dimensioned relative to each other to provide a close slip fit so that lower portion 14 and upper portion 12 are concentric with each other.

In a preferred embodiment, bushing head 122 has a width W<sub>2</sub> of 0.110/0.115 inches and a radiused edge 148 of 0.020/0.025 inches. The inner diameter ID<sub>2</sub> of bore 138 is 0.1800/0.1803 inches. A 45° chamfer 150 allows threaded portion 144 to easily engage threaded region 130. Neck 146 is 0.373+/-0.002 inches in diameter by 0.110 inches wide. Threaded region 120 is a 7/16-14x0.780 long thread which has an outer diameter of 0.436/0.430 inches and a pitch diameter of 0.389/0.384 inches. The gap "g" between the threads is 0.018/0.021 inches wide. The total length L<sub>10</sub> of sleeve bushing 118 is one inch. The threaded region 130 has a 0.310-12.3x0.800 inches deep thread with a pitch diameter of 0.2557/0.2562 inches and an inner diameter of 0.241/0.237 inches. The outer diameter of bushing head 122 is 0.481+0.000/-0.001 inches.

In a preferred embodiment, the outer diameter OD<sub>2</sub> of shaft 128 is 0.1800/0.1798 inches. Radius 142 allows the

easy engagement of shaft 128 with bore 138. The length L12 of shaft 128 is 0.240/0.250 inches. Threaded region 144 is a 0.310-12.3 threadx0.750+/-0.005 inches long with a pitch diameter of 0.2555/0.2558 inches. Smooth portion 140 is a transition region separating threaded regions 124 and 144. Transition region 140 has a width W<sub>3</sub> of 0.250 inches. Threaded region 124 is a 5/16-14 thread having a outer diameter of 0.310/0.306 inches and a pitch diameter of 0.264/0.261 inches.

FIG. 5 depicts another preferred embodiment of the present invention. Multi-piece cue stick 210 has a lower stick portion 214 and an upper stick portion 212 which are capable of being joined together by a coupling 211. Coupling 211 includes a sleeve bushing 218 and coupling rod 216 which are attached to stick portions 214 and 212 respectively. Coupling rod 216 has a shaft 228 and a threaded region 226 for engaging an internal smooth bore 238 and an internal threaded region 230 within sleeve bushing 218. Coupling 211 also includes a tapered collar 240 fastened to the end of upper stick portion 212 for surrounding and protecting the threads 226 of coupling rod 216.

Stick portions 212 and 214 are coupled together by inserting shaft 228 of coupling rod 216 into bore 238 of sleeve bushing 218 until threaded region 226 reaches bushing head 222 of sleeve bushing 218. Stick portions 212 and 214 are then rotated relative to each other so that threaded region 226 engages threaded region 230. The stick portions 212 and 214 are rotated for about one revolution until end 240a of collar 240 is tightened against end 214a of stick portion 214. Shaft 228 locates stick portions 212 and 214 concentric with each other so that any runout in the threaded regions 226 and 230 does not affect the concentricity of stick portions 212 and 214.

Sleeve bushing 218 has an external threaded region 220 which allows sleeve bushing 218 to be secured to lower stick portion 214 by screwing and gluing sleeve bushing 218 into threaded hole 217 until bushing head 222 abuts end 214a of lower stick portion 214. Hole 217 is drilled deeper than the length of threaded region 220 in order to form a cavity 215 beyond sleeve bushing 218. Cavity 215 receives air displaced by shaft 228 of coupling rod 216 when stick portions 212 and 214 are coupled together. It is of sufficient volume to prevent excessive pressure buildup which would interfere with coupling of the stick portion.

Sleeve bushing 218 is similar to sleeve bushing 18 but differs mainly in that the dimensions are slightly different. Sleeve bushing 218 is 0.985 inches long. Threaded region 220 has an M-12x1.75 modified thread in which the major diameter is preferably 0.463 inches and the pitch diameter is 0.419/0.420 inches. Bushing head 222 is 0.130 inches wide and is 0.490+0.001/-0.000 inches in diameter.

Alternatively, other suitable pitches can be used such as a 9 pitch or a 10 pitch. Bore 238 is preferably 0.2797 0.0002/-0.0000 inches in diameter. Neck 220a is 0.125 inches wide and is 0.426 inches in diameter. Sleeve bushing 218 is preferably made of brass.

Coupling rod 216 is secured to upper stick portion 212 by screwing and gluing threaded region 224 into the threaded region 208b of hole 208. Diameter 225 fits within and is glued to the smooth region 208a of hole 208 which centers coupling rod 216 concentrically within upper stick portion 212. Coupling rod 216 is screwed into hole 208 until threaded region 226 abuts against end 204 of upper stick portion 212.

Coupling rod **216** is similar to coupling rod **16** but differs mainly in that coupling rod **216** has a smooth diameter **225** between threaded regions **226** and **224**. Additionally, the dimensions of coupling rod **216** are slightly different than those of coupling rod **16**. The length of coupling rod **216** is preferably 3.3750 inches. Diameter **225** has a spiral groove **225a** into which glue can seep. This forms a strong bond between diameter **225** and the smooth region **208a** of hole **208**. Groove **225a** has ten threads per inch and is 0.005 to 0.008 inches deep. Diameter **225** preferably has a 125 micro-inch finish, is 1.125 inches long and has a diameter of 0.313+0.0000/-0.0005 inches. Threaded region **224** is 1.410 inches long and has a  $\frac{5}{16}$ -14 modified thread with a major diameter of 0.304/0.300 inches and a pitch diameter of 0.257/0.254 inches. Tapered hole **227** provides a center for turning coupling rod **216** as well as a starter hole for drilling out the interior of coupling rod **216** to lighten the weight of coupling rod **216**.

Threaded region **226** is preferably 0.218 inches long with a single lead thread. Threaded region **226** is an 11 pitch thread with a major diameter of 0.369+000/-0.002 inches and a minor diameter of 0.311+0.000/-0.002 inches. The short length of threaded region **226** provides a quick lead thread which ends in about  $1\frac{3}{4}$  revolutions. Alternatively, the length of the single thread in threaded region **226** can range from  $\frac{1}{4}$  to no more than 2 revolutions. Threaded region **226** is dimensioned such that there is limited clearance between threaded region **226** of coupling rod **216** and threaded region **230** of sleeve bushing **218**. The minor diameter of the threaded region **226** preferably rides on the major diameter of threaded region **230**. This helps keep the coupling rod **216** and the sleeve bushing **218** to be concentric with each other. Threaded region **226** preferably has a thread form which does not easily cross thread such as a thread with a truncated root and crest. This includes stub acme-type threads or buttress threads. Alternatively, threaded region **226** can have a sharp vee thread or can have other suitable pitches such as a 9 pitch or a 10 pitch.

Shaft **228** is 0.970 inches long and is 0.2789+0.0000/-0.0002 inches in diameter. The length of shaft **228** is at least about three times its diameter. This provides a clearance between shaft **228** and bore **238** of sleeve bushing **218** ranging from 0.0012 inches loose to 0.0008 inches loose. However, alternatively, the clearance between shaft **228** and bore **238** can be made to be as little as about 0.0005 inches or as large as about 0.002 inches. Additionally, for low cost sticks, the clearance can be made to be as large as 0.010 inches when the concentricity between stick portions **212** and **214** does not need to be precise. Tip **234** has a  $5^\circ$  angle which is  $\frac{1}{4}$  inches long and ends in a 0.125 inch radius. The  $5^\circ$  angle on tip **234** allows an assembled upper stick portion **212** to be turned between centers with a reverse center holding tip **234** so that upper stick portion can be sanded or subjected to other operations. The  $5^\circ$  angle and 0.125 inch radius on tip **234** also allows tip **234** to sustain damaged on those surfaces (such as if upper stick portion **212** is dropped) without affecting the fit between shaft **228** and bore **238** of sleeve bushing **218**. This is due to the fact that the surfaces of the  $5^\circ$  angle and 0.125 inch radius are not in a sliding fit with bore **238**. In the preferred embodiment, coupling rod **216** is made of stainless steel and shaft **228** is given a hard coat which allows shaft **228** to slide easily within bore **238** of sleeve bushing **218**. Alternatively, shaft **228** can be given a textured finish by cutting shaft **228** at a high feed rate or other suitable means such as grinding, rolling or sandblasting.

Tapered collar **240** is secured to upper stick portion **212** concentric with coupling rod **216** by respective threaded

regions **244** and **206** of collar **240** and upper stick portion **212**. Collar **240** is screwed onto upper stick portion **212** until collar **240** abuts against shoulder **202**. Glue is applied to threaded regions **244** and **206** to prevent collar **240** from loosening. Collar **240** extends beyond and surrounds threaded region **226** of coupling rod **216** to protect threaded region **226**. The short length of threaded region **226** allows threaded region **226** to be completely inside cavity **242** of collar **240**.

The number of revolutions required to engage and disengage stick portions **212** and **214** can be controlled by controlling the gap  $g_1$  between shoulder **246** of collar **240** and end **204** of upper stick portion **212**. Gap  $g_1$  can be varied by varying the distance between shoulder **202** and end **204**. Controlling the gap  $g_1$  allows end **240a** to be axially positioned relative to threaded region **226** so that sleeve bushing **218** does not engage the full length of threaded region **226**. In this manner, the number of turns required to engage and disengage stick portions **212** and **214** can be controlled or varied. Typically, gap  $g_1$  is set so that stick portions **212** and **214** engage and disengage in about one revolution. However, gap  $g_1$  can be set so that stick portions **212** and **214** engage and disengage in less than one revolution such as  $\frac{1}{4}$  of a revolution. Additionally, if the length of threaded regions **226** and **230** are sized accordingly, stick portions **212** and **214** can be made to engage and disengage in two revolutions, however, having two revolutions is considered unnecessary and undesirable. The preferable number of revolutions is no more than about one revolution.

The outer diameter of collar **240** preferably tapers from 0.852+0.000/-0.001 inches at end **240b** to 0.842+000/-0.001 inches at end **240a**. The length of collar **240** is 0.995+0.002/-0.000 inches. Collar **240** has a threaded region **244** having a  $\frac{5}{8}$ -18 modified thread 0.58 inches deep. The pitch diameter of threaded region **244** is 0.6225/-0.6255 inches and the minor diameter is 0.596/0.599 inches. Internal Diameter **248** is 0.5952+0.0002/-0.0000 inches. Shoulder **246** is 0.775+0.002/-0.000 inches away from surface **240b**. Cavity **242** is 0.495+0.002/-0.000 inches in diameter. Collar **240** is preferably made from stainless steel.

Referring to FIG. 6, joint protector **250** can be coupled to sleeve bushing **218** to protect sleeve bushing **218** against damage when multi-piece cue stick **210** is disassembled. Joint protector **250** has a threaded region **252** which mates with threaded region **230** on sleeve bushing **218** so that joint protector **250** can be screwed to sleeve bushing **218**. Bushing head **222** fits within recess **254** and is completely protected. Joint protector **250** is tightened until surface **250a** abuts against end **214a** of stick portion **214**.

Referring to FIG. 7, joint protector **260** can be coupled to coupling rod **216** to protect shaft **228**. Joint protector **260** has a threaded region **264** which mates with threaded region **226** of coupling rod **216** and has a bore **262** for accepting shaft **228**. Hub **266** extends within cavity **242** so that surface **260a** can be tightened against end **240a** of collar **240**. Joint protectors **250** and **260** are preferably made out of delrin but alternatively, can be made of other suitable materials such as nylon, aluminum, brass, wood, etc.

FIG. 8 depicts another preferred embodiment of the present invention. Coupling rod/collar assembly **270** is preassembled before being secured to upper stick portion **212**. Coupling rod/collar assembly **270** includes a coupling rod **280**, a collar **240** and an adapter **271**. Coupling rod **280** and adapter **271** are coupled together via respective threaded regions **284** and **279**. Glue is applied to threaded regions **284** and **279** to prevent disassembly. Adapter **271** and collar **240**

are coupled together via respective threaded regions **272** and **244**. Glue is also applied to threaded regions **272** and **244**. Adapter **271** is screwed within collar **240** until end **278** abuts shoulder **246**. Diameter **274** of adapter **271** mates with diameter **248** of collar **240** to align adapter **271** concentrically within collar **240**. In the preferred embodiment, adapter **271** is preferably made of phenolic but alternatively, can be made of other suitable plastics such as nylon, aluminum, brass, wood, steel, etc.

Coupling rod **280** differs from coupling rod **216** mainly in that threaded region **284** is located between threaded region **226** and smooth diameter **282**. Threaded region **284** is a 0.350-142A thread that is 0.375 inches long. A neck **286** separates threaded region **284** from threaded region **226**. Diameter **282** is 0.272+0.0005/-0.0000 inches in diameter and is 2.160 inches long.

Coupling rod/collar assembly **270** is secured to upper stick portion **212** by inserting and gluing diameter **282** into a hole within upper stick portion **212**. Collar **240** is screwed and glued onto a threaded diameter located at the end of upper stick portion **212**. Coupling rod/collar assembly **270** reduces the amount of labor required for assembling upper stick portion **212** and, therefore, increases production.

Although specific dimensions have been given for collar **240**, sleeve bushings **18**, **118** and **218**, and coupling rods **16**, **116**, **216** and **280**, those dimensions are merely examples and can be varied accordingly to accommodate different applications. Additionally, the specified tolerances and thread types can be varied. The materials for collar **240**, sleeve bushings **18**, **118** and **218** and coupling rods **16**, **116**, **216** and **280**, joint protectors **250** and **260**, and adapter **271** can be made from any suitable materials such as brass, aluminum, titanium, bronze, plastic, silver and gold as well as iron, steel or stainless steel. Sleeve bushings **18**, **118** and **218** can be coated with Teflon™ while the coupling rods **16**, **116**, **216** and **280** are coated with a hard coat or a metallic plating. This insures that the sleeve bushings **18**, **118** and **218** and the coupling rods **16**, **116**, **216** and **280** do not wear out quickly or become easily scratched. Sleeve bushings **18**, **118** and **218** and coupling rods **16**, **116**, **216** and **280** can be machined between centers on a lathe. Furthermore, stick portions **12** and **14** can have a flat machined on them so that a logo can be put on the flat. A laser can be used to mark stick portions **12** and **14**.

#### Equivalents

While this invention has been particularly shown and described with references to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

For example, a prior art coupling having a coupling rod with a long threaded portion can be modified to provide a coupling similar to that depicted in the figures. This is accomplished by turning down the threaded portion of the male coupling rod leaving a length of thread having only 1 or 2 turns of thread. The turned down portion of the coupling rod serves as a guide into the threaded sleeve. Such a coupling would have quick coupling capabilities but would not hold two cue stick portions together in as precise concentricity as when the sleeve has a smooth bore to accept a smooth elongate tip of the coupling rod. Other methods of modifying the prior art coupling includes cutting the male coupling rod to leave only 1 or 2 turns of thread or drilling

out the threads in the threaded sleeve to leave 1 or 2 turns of thread.

What is claimed is:

1. A cue stick comprising:

a first stick portion coupled to a sleeve, the sleeve having a smooth inner diameter portion and an internal threaded region having an uninterrupted thread, the sleeve having an external threaded region for coupling the sleeve to the first stick portion; and

a second stick portion coupled to a coupling rod, the coupling rod having a smooth elongate tip which has a close fit with the smooth inner diameter of the sleeve and a first external threaded region having an uninterrupted thread, the first external threaded region engages the internal threaded region of the sleeve for coupling the coupling rod to the sleeve, the coupling rod having a second external threaded region for coupling the coupling rod to the second stick portion, a smooth diameter region having a groove being adjacent to the second external threaded region.

2. The cue stick of claim 1 in which the internal threaded region of the sleeve and the first external threaded region of the coupling rod have truncated threads.

3. The cue stick of claim 1 in which the sleeve and the coupling rod are capable of being coupled within one revolution of the coupling rod.

4. The cue stick of claim 1 in which the tip of the coupling rod has a 5° angle for about 0.250 inches.

5. The cue stick of claim 1 in which the tip of the coupling rod terminates at a radius.

6. The cue stick of claim 1 in which the clearance between the smooth inner diameter portion of the sleeve and the smooth elongate tip of the coupling rod is less than about 0.002 inches.

7. A cue stick comprising:

a first stick portion coupled to a sleeve, the sleeve having a smooth inner diameter portion and an internal threaded region having an uninterrupted thread;

a second stick portion coupled to a coupling rod, the coupling rod having a smooth elongate tip which has a close fit with the smooth inner diameter of the sleeve and a first external threaded region having an uninterrupted thread, the first external threaded region engages the internal threaded region of the sleeve for coupling the coupling rod to the sleeve; and

a collar coupled to the second stick portion concentric with the coupling rod for surrounding and protecting the first external threaded region of the coupling rod.

8. The cue stick of claim 7 in which the position of the collar relative to the first external threaded region of the coupling rod determines the number of revolutions in which the coupling rod and sleeve can be coupled together.

9. The cue stick of claim 7 further comprising an adapter for positioning the coupling rod concentrically within the collar.

10. A cue stick comprising:

a first stick portion coupled to a sleeve, the sleeve having a smooth inner diameter portion and an internal threaded region having an uninterrupted thread with a quick lead; and

a second stick portion coupled to a coupling rod, the coupling rod having a smooth elongate tip which has a close fit with the inner diameter of the sleeve and a first external threaded region having an uninterrupted thread with a quick lead, the first external threaded region engages the internal threaded region of the sleeve for

9

coupling the coupling rod to the sleeve, the sleeve and the coupling rod being capable of being coupled within approximately one revolution of the coupling rod, the coupling rod having a second external threaded region for coupling the coupling rod to the second stick portion, a smooth diameter region having grooves being adjacent to the second external threaded region.

11. The cue stick of claim 10 in which the sleeve has an external threaded region for coupling the sleeve to the first stick portion.

12. The cue stick of claim 10 in which the internal threaded region of the sleeve and the first external threaded region of the coupling rod have truncated threads.

13. The cue stick of claim 10 in which the tip of the coupling rod has a 5° angle for about 0.250 inches.

14. The cue stick of claim 10 in which the tip of the coupling rod terminates at a radius.

15. The cue stick of claim 10 in which the clearance between the smooth inner diameter portion of the sleeve and the smooth elongate tip of the coupling rod is less than about 0.002 inches.

16. A cue stick comprising:

a first stick portion coupled to a sleeve, the sleeve having a smooth inner diameter portion and an internal threaded region having an uninterrupted thread with a quick lead;

a second stick portion coupled to a coupling rod, the coupling rod having a smooth elongate tip which has a close fit with the inner diameter of the sleeve and a first external threaded region having an uninterrupted thread with a quick lead, the first external threaded region engages the internal threaded region of the sleeve for coupling the coupling rod to the sleeve, the sleeve and the coupling rod being capable of being coupled within approximately one revolution of the coupling rod; and

a collar coupled to the second stick portion concentric with the coupling rod for surrounding and protecting the first external threaded region of the coupling rod.

17. The cue stick of claim 16 in which the position of the collar relative to the first external threaded region of the coupling rod determines the number of revolutions in which the coupling rod and sleeve can be coupled together.

18. The cue stick of claim 16 further comprising an adapter for positioning the coupling rod concentrically within the collar.

19. A coupler for a cue stick comprising:

a sleeve for coupling to a first stick portion, the sleeve having a smooth inner diameter portion and an internal threaded region having an uninterrupted thread, the

10

sleeve having an external threaded region for coupling the sleeve to the first stick portion; and

a coupling rod for coupling to a second stick portion, the coupling rod having a smooth elongate tip which has a close fit with the smooth inner diameter of the sleeve and a first external threaded region having an uninterrupted thread, the first external threaded region engages the internal threaded region of the sleeve for coupling the coupling rod to the sleeve, the coupling rod having a second external threaded region for coupling the coupling rod to the second stick portion, a smooth diameter region having a groove being adjacent to the second external threaded region.

20. The coupler of claim 19 in which the sleeve and the coupling rod are capable of being coupled within one revolution of the coupling rod.

21. The coupler of claim 19 in which the clearance between the smooth inner diameter portion of the sleeve and the smooth elongate tip of the coupling rod is less than about 0.002 inches.

22. A cue stick comprising:

a first stick portion coupled to a sleeve, the sleeve having an internal threaded region having an uninterrupted thread, the sleeve having an external threaded region for coupling the sleeve to the first stick portion; and

a second stick portion coupled to a coupling rod, the coupling rod having a first external threaded region having an uninterrupted thread such that the first external threaded region engages the internal threaded region of the sleeve for coupling of the coupling rod to the sleeve, the coupling rod having a second external threaded region for coupling the coupling rod to the second stick portion, a smooth diameter region having a groove being adjacent to the second external threaded region.

23. A cue stick comprising:

a first stick portion coupled to a sleeve, the sleeve having an internal threaded region having an uninterrupted thread;

a second stick portion coupled to a coupling rod, the coupling rod having a first external threaded region having an uninterrupted thread, the first external threaded region engages the internal threaded region of the sleeve for coupling the coupling rod to the sleeve; and

a collar coupled to the second stick portion concentric with the coupling rod for surrounding and protecting the first external threaded region of the coupling rod.

\* \* \* \* \*