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(54) POOL CUE WITH CHANGEABLE CENTER OF GRAVITY

(57) Disclosed in the present invention is a pool cue with changeable center of gravity comprises a front end hand rack rod (1) and a rear end hand-held rod (2). A connecting rod (3) is connected with the end of the front end hand rack rod (1). A plurality of ring counterweight pieces (4) run through the connecting rod (3). Each ring counterweight piece (4) has the same external diameter and thickness. Every ring counterweight pieces (4) has the same external diameter such that they can be arrayed at random order. The ring counterweight pieces(4) are made of various materials with different density and different weight, such that the gravity center of the pool cue can be adjusted by arraying the ring counterweight pieces (4) even though the ring counterweight pieces (4) have the same quantity and the same total weight.

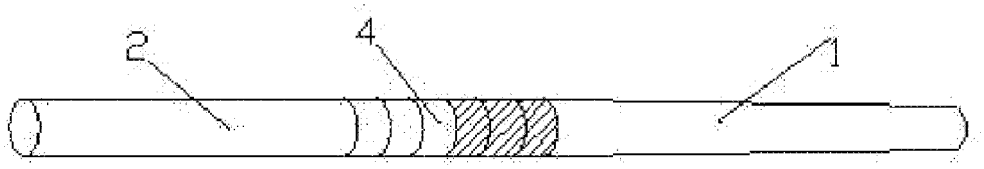


Fig. 1

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Description

TECHNICAL FIELD

[0001] The present application relates to the technical field of sports apparatus, and in particular to a billiard cue with variable center of gravity.

BACKGROUND

[0002] A billiard cue with adjustable weight, center of gravity and length is disclosed in Patent No. ZL201020544266.X, a middle part thereof is a cylindrical connecting rod, and several circular ring counterweights are mounted on the cylindrical connecting rod. Weight, position of center of gravity and length of the billiard cue may be adjusted by arranging circular rings having the same shape and different weights at the same position. However, the circular ring counterweights at different positions have different outer diameters, thus in use the circular ring counterweights have to be arranged in order which can not be disrupted randomly, thereby causing inconvenience.

SUMMARY

[0003] In order to overcome the above defect, an object of the present application is to provide a billiard cue with variable center of gravity which has circular ring counterweights made of various materials having different densities and different weights.

[0004] For realizing the above object, the present application provides the following technical solution. A billiard cue with variable center of gravity includes a front end hand supporting rod, a rear end hand gripping rod, and a connecting rod connected to a rear end of the front end hand supporting rod, and a plurality of circular ring counterweights are mounted on the connecting rod, and each of the circular ring counterweights has the same outer diameter and thickness.

[0005] Compared to the prior art, the present application has the following advantages.

[0006] 1. Each circular ring counterweight in the present application has the same outer diameter, thus can be arranged in a random order.

[0007] 2. The circular ring counterweights in the present application are made of various materials having different densities and different weights, and the position of center of gravity of the billiard cue can be adjusted by arranging the circular ring counterweights in different orders even though the total numbers and total weights of the circular ring counterweights are constant.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

Figure 1 is a schematic view showing the structure of a first embodiment of the present application;

Figure 2 is a schematic view showing the structure of a second embodiment of the present application;

Figure 3 is a schematic view showing the structure of a third embodiment of the present application; and

Figure 4 is a schematic view showing the structure of a connecting rod of the present application.

DETAILED DESCRIPTION

First Embodiment

[0009] Referring to Figures 1 and 4, the billiard cue according to the first embodiment has a front portion provided with a circular ring counterweight made of material with larger density and larger weight, and a rear portion provided with a circular ring counterweight made of material with smaller density and smaller weight. The billiard cue includes a front end hand supporting rod 1, a rear end hand gripping rod 2, and a connecting rod 3 connected to a rear portion of the front end hand supporting rod 1, and a plurality of circular ring counterweights 4 are mounted on the connecting rod 3, and each of the circular ring counterweights 4 has the same outer diameter and thickness. A center of gravity of the billiard cue having the circular ring counterweights arranged in the above order is located at a position near the front portion.

Second Embodiment

[0010] Referring to Figures 2 and 4, the billiard cue according to the second embodiment has a front portion provided with a circular ring counterweight made of material with smaller density and smaller weight, and a rear portion provided with a circular ring counterweight made of material with larger density and larger weight. The billiard cue includes a front end hand supporting rod 1, a rear end hand gripping rod 2, and a connecting rod 3 connected to a rear portion of the front end hand supporting rod 1, and a plurality of circular ring counterweights 4 are mounted on the connecting rod 3, and each of the circular ring counterweights 4 has the same outer diameter and thickness. A center of gravity of the billiard cue having the circular ring counterweights arranged in the above order is located at a position near the rear portion.

Third Embodiment

[0011] Referring to Figures 3 and 4, the billiard cue according to the third embodiment has circular ring counterweights made of various materials with different densities and different weights and arranged alternately. The billiard cue includes a front end hand supporting rod 1, a rear end hand gripping rod 2, and a connecting rod 3

connected to a rear portion of the front end hand supporting rod 1, and a plurality of circular ring counterweights 4 are mounted on the connecting rod 3, and each of the circular ring counterweights 4 has the same outer diameter and thickness. A center of gravity of the billiard cue having the circular ring counterweights arranged in the above order is located between the center of gravity in the first embodiment and the center of gravity in the second embodiment.

[0012] Three embodiments are illustrated herein in the present application. The function of the present device may be realized by many embodiments, which will not be described herein. Many similar embodiments also fall into the protection scope of the present application.

Claims

1. A billiard cue with variable center of gravity, comprising a front end hand supporting rod (1), a rear end hand gripping rod (2), and a connecting rod (3) connected to a rear portion of the front end hand supporting rod (1), wherein a plurality of circular ring counterweights (4) are mounted on the connecting rod (3), and each of the circular ring counterweights (4) has the same outer diameter and thickness; and the circular ring counterweights (4) are made of various materials with different densities and different weights, and a position of center of gravity of the billiard cue is variable by arranging the circular ring counterweights (4) in different orders in a case that a total number and a total weight of the circular ring counterweights (4) are constant.

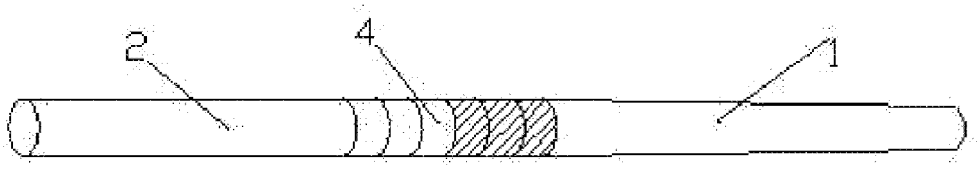


Fig. 1

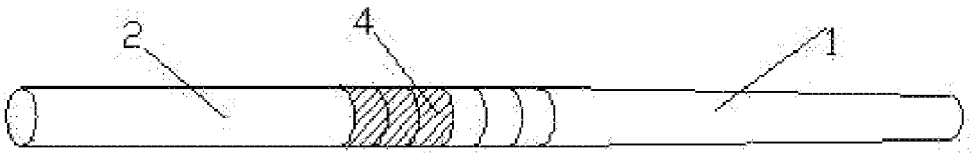


Fig. 2

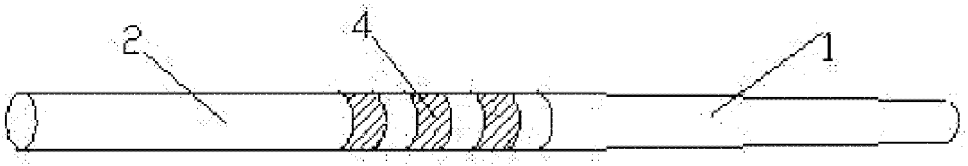


Fig. 3

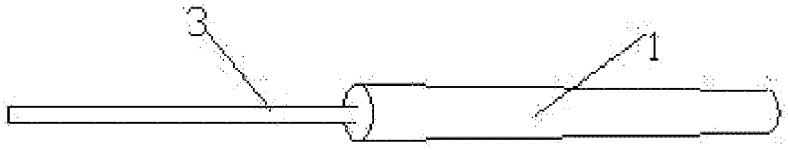


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2012/073713

A. CLASSIFICATION OF SUBJECT MATTER

A63D 15/08 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A63D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNKI, CNPAT, EPODOC, WPI: cue, barycenter/(center 2w gravity), counter weight

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 201791351 U (RAO, Tao), 13 April 2011 (13.04.2011), description, page 1, paragraphs 4 to page 2, paragraph 11, and figures 1-2	1
X	US 6939237 B1 (VODEN, J.L.), 06 September 2005 (06.09.2005), description, column 2, line 44 to column 3, line 34, and figures 1-4	1
X	CN 101934138 A (RAO, Tao), 05 January 2011 (05.01.2011), description, page 1, paragraph 4 to page 2, paragraph 11, and figures 1-2	1
X	WO 2008037961 A1 (BCE DISTRIBUTORS LTD.), 03 April 2008 (03.04.2008), description, page 3, paragraph 1 to page 5, paragraph 2, and figures 1-7	1
PX	CN 102179042 A (RAO, Tao), 14 September 2011 (14.09.2011), description, paragraphs 10-12	1
A	CN 2633377 Y (TAIQUAN INTERNATIONAL CO., LTD.), 18 August 2004 (18.08.2004), the whole document	1

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 June 2012 (27.06.2012)	**02 August 2012 (02.08.2012)**
Name and mailing address of the ISA/CN: State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No.: (86-10) 62019451	Authorized officer **MA, Tianqi** Telephone No.: (86-10) **62085407**

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2012/073713

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 201791351 U	13.04.2011	None	
US 6939237 B1	06.09.2005	None	
CN 101934138 A	05.01.2011	WO 2012040991 A	05.04.2012
WO 2008037961 A1	03.04.2008	GB 2443801 A	21.05.2008
		EP 2077906 A1	15.07.2009
		AT 543544 T	15.02.2012
CN 102179042 A	14.09.2011	None	
CN 2633377 Y	18.08.2004	None	

Form PCT/ISA/210 (patent family annex) (July 2009)