June 3, 1969 F. C. BALEY, JR., ET AL 3,447,805

SPRING-POWERED CUE

Filed Jan. 6, 1966

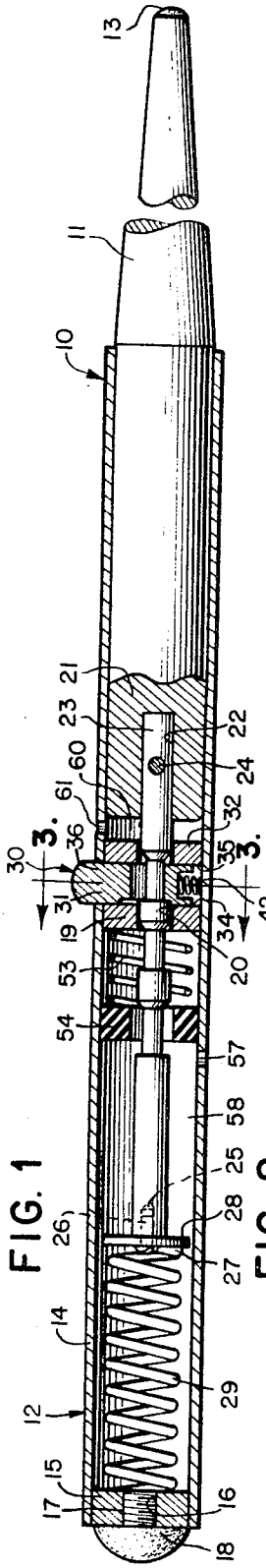


FIG. 1

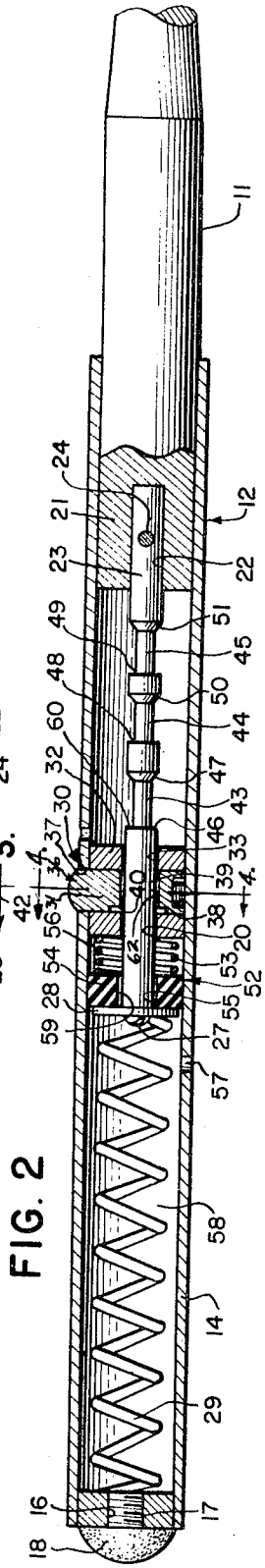


FIG. 2

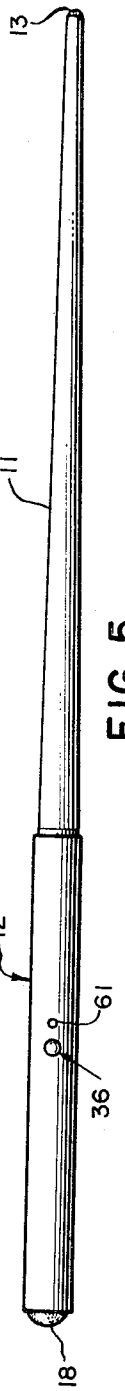


FIG. 5

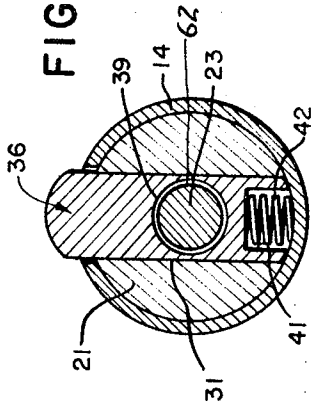


FIG. 4

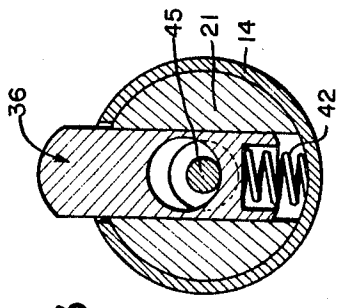


FIG. 3

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SPRING-POWERED CUE

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ABSTRACT OF THE DISCLOSURE

A spring powered cue including a shock absorber comprised a coil spring and a pneumatic spring. The pneumatic spring includes an annulus slideable in the handle section through which an extension of the relatively movable foresection passes. A member disposed on the extension cooperates with the annulus to form an air cushion between the annulus and the trigger assembly of the cue.

This invention relates to a spring-powered cue, and more particularly, to a new and improved construction for a cue of the type utilized for playing pool, billiards and other like games wherein spring means are employed for supplying a uniform and even stroke force and wherein readily adjustable means are incorporated therein for varying the magnitude of such uniform and even stroke force.

An important object of the present invention is to provide a cue construction in such a manner that an even stroke may be imparted to the cue ball substantially automatically without the usual cue stroking action required of the player so as to relieve the player of manually regulating the length and intensity of the stroke and permits him to concentrate on the aiming of the cue with the result that greater accuracy in making shots is achieved with a minimum of effort and cue-handling skill on the part of the player.

More specifically, the invention contemplates a cue construction wherein the force of the stroke may be readily varied and the adjustable means for varying the force of the stroke is simple in design so as to be relatively inexpensive to manufacture but yet is sturdy and durable in construction.

Another object is to incorporate shock absorber means in the spring-powered mecanism of a cue of the aforementioned type so as to mitigate the transfer of shocks and strains between the relatively movable parts of the cue with the result that the trouble-free operational life of the cue is prolonged indefinitely.

The foregoing and other important objects and desirable features inherent in and encompassed by the invention, together with many of the purposes and uses thereof, will become readily apparent from a reading of the ensuring description in conjunction with the annexed drawing, in which:

FIGURE 1 is a longitudinal sectional view, partly in elevation and partly broken away, of a cue embodying the invention, the spring mechanism illustrated in its loaded or cocked condition;

FIGURE 2 is a view similar to FIGURE 1 with the exception that the spring mechanism is illustrated in its unloaded or released condition;

FIGURE 3 is a transverse sectional view taken substantially along line 3—3 of FIGURE 1;

FIGURE 4 is a transverse sectional view taken substantially along line 4—4 of FIGURE 2; and

FIGURE 5 is an enlarged plan view of a section of the cue.

Referring to the drawing in detail, wherein like reference characters represent like elements throughout the various views, the invention is embodied in a cue, designated generally by reference character **10**. The cue **10** in general, comprises an elongated body portion **11** preferably made of hard wood, and a generally tubular stock or handle member **12**. The body portion **12** generally cylindrical tube **14**, preferably made of metal, which outer or forward end is provided with the usual ball-engaging tip **13**.

The tubular handle member **12** includes a generally cylindrical tube **14**, preferably made of metal, which has one end closed by plug **15** suitably fixed thereto. The plug **15** is provided with a central threaded aperture **16** for receiving a threaded bolt-like portion **17** secured to and extending from the flat side of a semi-spherical rubber bumper **18**. The purpose of the bumper **18** will be pointed out hereinafter. The tubular handle member **12** also includes a second plug **19** which is disposed within and spaced intermediate the ends of the tube **14**. The plug **19** is fixedly secured to the tube **14** in a suitable manner and has a central cylindrical bore **20** extending longitudinally therethrough.

As shown in FIGURES 1 and 2, the end section **21** of the wooden body portion **11** opposite the ball-engaging tip **13** is slidably mounted within the open end of the tube **14**. The end of the wooden body portion **11** disposed within the tube **14** is provided with a central recess **22** into which one end of an elongated rod **23** extends. The rod **23** is fixedly secured to the body portion **11** by means of a transversely extending pin **24**. The rod **23** extends longitudinally freely through the bore **20** of the plug **19** and end thereof opposite the secured end is provided with a threaded recess **25** for receiving the shank portion **26** of a cap screw **27**. The cap screw **27** is employed for securing a disk **28** to the innermost end of the rod **23**. A helically wound compression spring **29** has one end bearing against the disk **28** and its opposite end reacting against the end plug **15**. From the foregoing, it will be appreciated that the body portion **11** is yieldably urged longitudinally outwardly from the handle member **12**.

The trigger or latch means **30** of the present invention includes a transversely movable, generally cylindrical latch element **31**. The latch element **31** is incapable of moving longitudinally with respect to the handle member **12** since it is sandwiched between the fixed plug **19** and a plug **32** similar to plug **19**, also fixedly secured to the interior of the tube **14**. The plug **32** is provided with a bore **33** therethrough which is coaxial with the bore **20** of the plug **19** for accommodating the rod **23** freely therethrough. The longitudinal spacing between the facing surfaces **34** and **35** of the plugs **19** and **32**, respectively is slightly larger than the diameter of the latch element **31**, and, consequently, the latch element **31** is free to slide transversely with respect to the tube **14** but is prevented from moving longitudinally with respect thereto. A finger button portion **36** projects outwardly transversely from the tube **14** through an opening **37** therethrough. The latch element **31** is provided with a generally circular shallow recess **38** which has a diameter greater than the diameter of the rod **23**, as clearly illustrated in FIGURE 2. One end of a longitudinal bore **39** opens into the recess **38** and its opposite end extends to the plug surface **35**. The diameter of the bore **39** is slightly larger than the diameter of the rod **23** but considerably smaller than the diameter of the recess **38** and, as a result, a generally annular shoulder **40** is provided at the juncture of the recess **38** and the bore **39**. The purpose of the shoulder **40** will be pointed out hereinafter. It will also be noted that the end of the latch element **31** opposite the finger button portion **36** is recessed to provide a pocket **41** for receiving and retaining one end of a helically wound compression spring **42** which also bears against the interior surface of the tube **14**. It will be appreciated that the spring **42** biases the latch element **31**

transversely outwardly. When assembled, the rod **23** extends through the coaxially aligned recess **38** and bore **39**.

As clearly shown in FIGURES 1 and 2, the rod **23** is provided with three longitudinally spaced, reduced diameter sections **43**, **44** and **45**. It is to be understood that the rod **23** could be provided with a greater number of reduced diameter sections without departing from the spirit and scope of the invention. One end of the reduced diameter section **43** is defined by a flat annular surface **46** and the opposite end by a tapered annular surface **47**. In a similar manner the opposite ends of the reduced diameter sections **44** and **45** are defined by flat annular surfaces **48**, **49**, respectively, and tapered annular surfaces **50**, **51**, respectively. It is to be noted that the reduced diameter sections **43**, **44**, **45** have the same length which is slightly larger than the length of the bore **39** formed in the latch element **31**.

In use, the rubber bumper **18** is placed against the floor or other stationary object or structure and thereafter the body portion **19** is pressed into the handle **12** from the position shown in FIGURE 2. The rubber bumper **18** prevents slipping of the bottom end of the cue **10** during the cocking or loading operation and reduced the possibility of scratching or otherwise marring the floor or other stationary surface used in the operation. Obviously such relative movement of the body portion **11** of the cue **10** with respect to the handle **12** effects compression of the coil spring **29**. Relative movement of the handle **12** and body portion **11** continues until the reduced diameter section **43** is completely disposed within the bore **39** at which moment the latch element **31** moves transversely outwardly with a snap action by virtue of the spring **42**. When the latch element **31** is in this position which corresponds to its locked position if pressure on the body portion **11** is relaxed, the relative position of the handle **12** and body portion **11** is maintained since a portion of the flat annular surface **46** is in abutting engagement with a portion of the flat annular shoulder **40** of the latch element **31**. When in this condition the cue **10** is ready for actuation. By simply depressing the finger button portion **36** sufficiently to cause the portions of the flat annular shoulder **40** and the flat annular surface **46** to move out of engagement with each other, the rod **23** and the body portion **11** fixedly attached thereto are impelled outwardly from the handle **12** by the resilient action of the compression spring **29**. If it is desired to increase the magnitude of the force of the stroke it is only necessary to continue applying pressure to the cue body portion **11** after the reduced diameter section **43** is disposed within the bore **39**. Such continued pressure application and longitudinal movement of the rod **23** with respect to the handle **12** causes the latch element **31** to move transversely inwardly against the resilient action of the latch spring **42** since the tapered annular surface **46** which engages the latch element surface adjacent the bore **39** acts as a cam. Relative longitudinal movement of the body portion **11** and handle **12** and further compression of the spring **29** continues until the reduced diameter section **44** is disposed within the bore **39** and the latch element shoulder **40** is snapped into abutting engagement with the flat annular surface **48**. The latch button portion **36** may be then depressed in the aforementioned manner to actuate the cue body portion **11**. However, if a still greater magnitude of stroke is desired, additional pressure is applied to the body portion **11** when the reduced diameter section **44** is disposed in the bore **39** to effect relative longitudinal movement of the rod **23** and handle **12** and simultaneously transverse movement of the latch element **31**, the latter movement being effected by the camming action afforded by the tapered annular surface **50** on the latch element **31**. When the reduced diameter section **45** is disposed in the bore **39** and the flat annular surface **49** is in abutting engagement with the annular shoulder **40**, the cue **10** is conditioned to provide the maximum magnitude of stroke force. From the foregoing, it will be appreciated that the magnitude of the stroke force may be accurately and uniformly regulated with a minimum of effort.

As pointed out hereinbefore, one of the important objects of the present invention is to incorporate shock absorber means in the cue **10** so at to mitigate the transfer of shocks and strains between the relatively movable parts and thus substantially reduce the possibility of breakage and malfunction of the parts. The shock absorber means which is designated generally by reference character **52**, includes a helically wound compression spring **53** of considerably shorter length and weight than the compression spring **29** encircling the rod **23** and having one end bearing against the fixed plug **19**. The opposite end of the spring **53** reacts against a rubber disk **54** which is slidably mounted within the tube **14**. The rubber disk **54** is provided with a circular opening **55** therethrough for freely accommodating the rod **23**, the diameter of the opening **55** being slightly larger than the diameter of the rod **23**. The shock absorber means **52** of the present invention is preferably of the mechanical-pneumatic type wherein the shock force of the rod **23** and cue body portion **11** is absorbed by simultaneously compressing the spring **53** and a body of air contained within a chamber **56** partially defined by the rubber disk **54**, plug **19** and the tube **14**. The shock absorber means **52** comes into action only during the extremely latter part of the power stroke of the cue body portion **11**. When the cue **10** is cocked or spring-loaded, as shown in FIGURE 1, and ready for use, the disk **28** is longitudinally spaced from the rubber disk **54**. Thus, with the resilient action of the heavy spring **29** removed therefrom, the lighter spring **53** is permitted to expand to its fully expanded condition, as shown in FIGURE 1, moving the rubber disk **54** longitudinally away from the fixed plug **19** during the process. A small aperture **57** is provided in the tube **14** to allow some of the air contained within the space **58** between the rubber disk **54** and the closed end of the tube **14** to exhaust so as not to hamper complete expansion of the spring **53** and movement of the rubber disk **54**. Once the rod **23** is unlocked by depression of the latch finger button portion **36**, the disk **28** fixed to the rod end is propelled toward the rubber disk **54** and until it engages the rubber disk **54**, the air chamber **56** is in fluid communication with space **58** between the closed end of the tube **14** and the rubber disk **54**, which, as stated hereinbefore, is in fluid communication with the atmosphere by virtue of the aperture **57**. However, the instant the disk **28** engages the rubber disk **54**, fluid communication between the air chamber **56** and the space **58** is precluded. Thereafter, the air in the chamber **56** can not escape therefrom by flowing through the annular passage **59** provided between the rod **23** and the central opening **55** in the rubber disk **54** and can only be exhausted through the passageway **62** between the rod **23** and the bore **39** of the latch element **31**. The velocity of the air flowing from the air chamber **56** is controlled or metered by the area of the passageway **62**. The enclosed space **60** between the plug **32** and the innermost end of the cue body portion **11**, into which air flowing from the chamber **56** is exhausted, is in fluid communication with the atmosphere by means of an aperture **61**. The aperture **61** eliminates the possibility of a vacuum being developed in the space **60** during the power stroke of the body portion **11** which could adversely influence the operation thereof. It will be appreciated that the disk **28** is prevented from striking the fixed plug **19** at the termination of the power stroke of the body portion **11**, which if repeated for a short time would ultimately result in damage to various parts of the cue **10**, by the joint cushioning action afforded by the mechanical spring **53** and the air spring means described hereinbefore.

The embodiment of the invention chosen for the purposes of illustration and description herein is that preferred for achieving the objects of the invention and developing the utility thereof in the most desirable manner, due regard being had to existing factors of economy, sim-

plicity of design and construction, and the improvements sought to be effected. It will be appreciated, therefore, that the particular structural and functional aspects emphasized herein are not intended to exclude, but rather to suggest, such other adaptations and modifications of the invention as fall within the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A cue comprising, a tubular handle having a closed end and an open end; an elongated body portion having an end section extending into said open end of said handle, said end section being supported for relative longitudinal sliding movement in said handle, said body portion being longitudinally slidable between an extended position and a plurality of longitudinaly spaced retracted positions; an elongated rod having one end fixed to the end of said body portion extending into said open end of said handle and extending coaxially and longitudinally in said handle, the closed end of said handle being provided with a generally circular disk; spring means disposed within said handle operatively engaging said handle and said body portion for yieldably urging said body portion toward its extended position the magnitude of the force exerted by said spring means on said body portion being different in each of said retracted positions of said body portion, said spring means including a helically wound compression spring having one end bearing against one side of said disk and its opposite end bearing against the closed end of said handle; manually releasable latch means operably engageable with said elongated body for selectively locking said body portion in each of said retracted positions; and shock absorber means operable near the end of the relative sliding movement of said handle and body portion as said body portion approaches its extended position from said retracted positions, said shock absorber means being effective to progressively retard and stop relative sliding movement between said handle and body portion and dissipate the momentum of said body portion, said shock absorber means including a second helically wound compression spring and a pneumatic spring, said second compression and pneumatic springs acting in unison, said pneumatic spring including an air chamber having an air inlet opening, and means responsive to the position of said rod as said body portion moves from its retracted positions toward its extended position for closing said inlet opening, and means longitudinally spaced from said

air inlet opening for simultaneously controlling the exhaust of air from said air chamber.

2. A cue at set forth in claim 1, wherein said pneumatic spring includes a rubber disk mounted in said handle for relative longitudinal sliding movement and partially defining said air chamber, said rubber disk having its peripheral edge in seating engagement with the interior surface of said handle, said rubber disk having a central opening serving as said air inlet opening for said air chamber, said second compression spring being disposed within said air chamber and having one end fixed with respect to said handle and its opposite end bearing against one side of said rubber disk, said rod extending loosely through said central opening in said rubber disk, and wherein said means responsive to the position of said rod for closing said inlet includes a metal disk, said metal disk moving into abutting engagement with one side of said rubber disk to close said air inlet opening during movement of said body portion from its retracted positions toward its extended position.

3. A cue as set forth in claim 2, wherein said means for simultaneously controlling the exhaust of air from said air chamber includes a restricted passageway for providing air communication between said air chamber and the atmosphere partially defined by said rod.

4. A cue as set forth in claim 3, wherein said manually releasable latch means includes a latch element mounted in said handle having a bore therethrough for accommodating said rod therethrough, said latch element being longitudinally fixed with respect to said handle, and said restricted passageway for controlling the exhaust of air from said air chamber being partially defined by said bore of said latch element.

References Cited

UNITED STATES PATENTS

1,062,816	5/1913	Burwell	273—69
1,473,507	11/1923	Obermaier	124—38 X
2,719,716	10/1955	Sawtelle	124—38 X
3,246,895	4/1966	Traill	273—69

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