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Miami, FL (US)(72) Inventor: **Erick Navarro,** Miami, FL (US)(21) Appl. No.: **15/804,540**(22) Filed: **Nov. 6, 2017****Publication Classification**(51) **Int. Cl.**

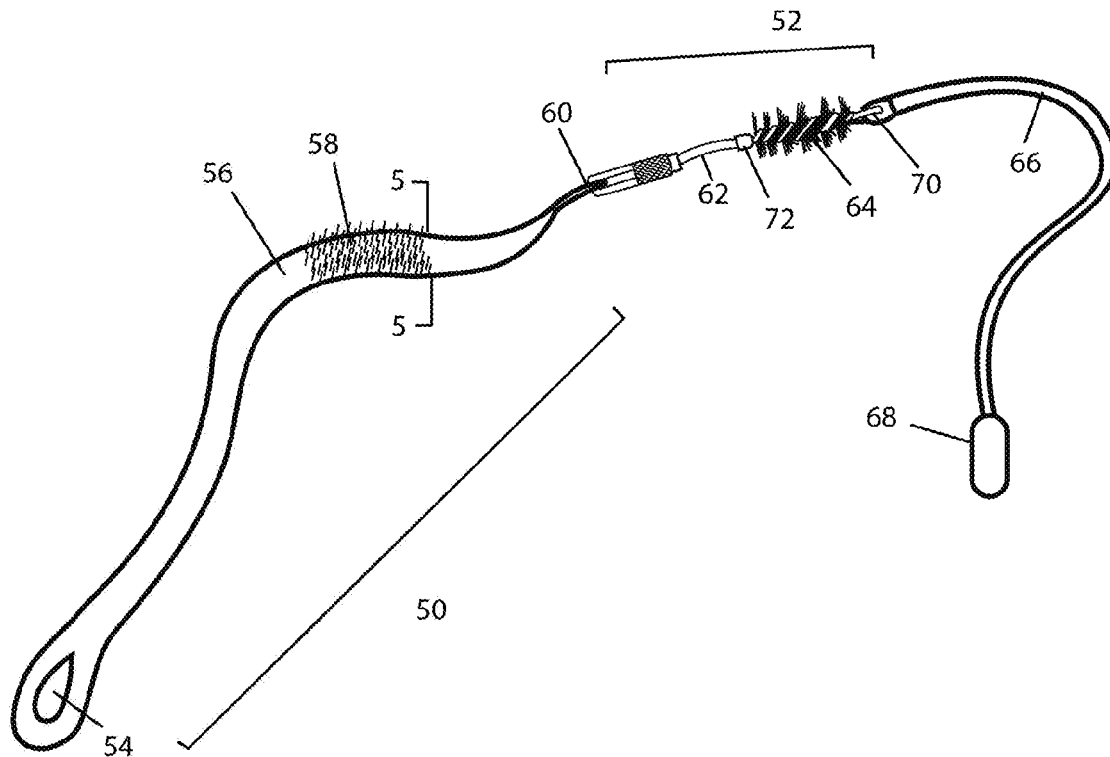
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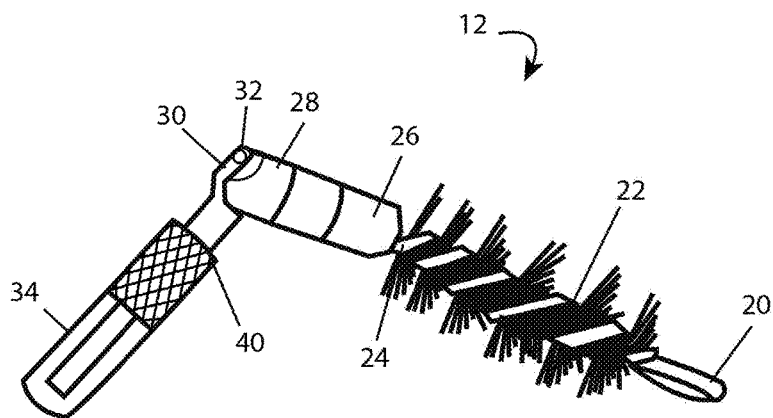
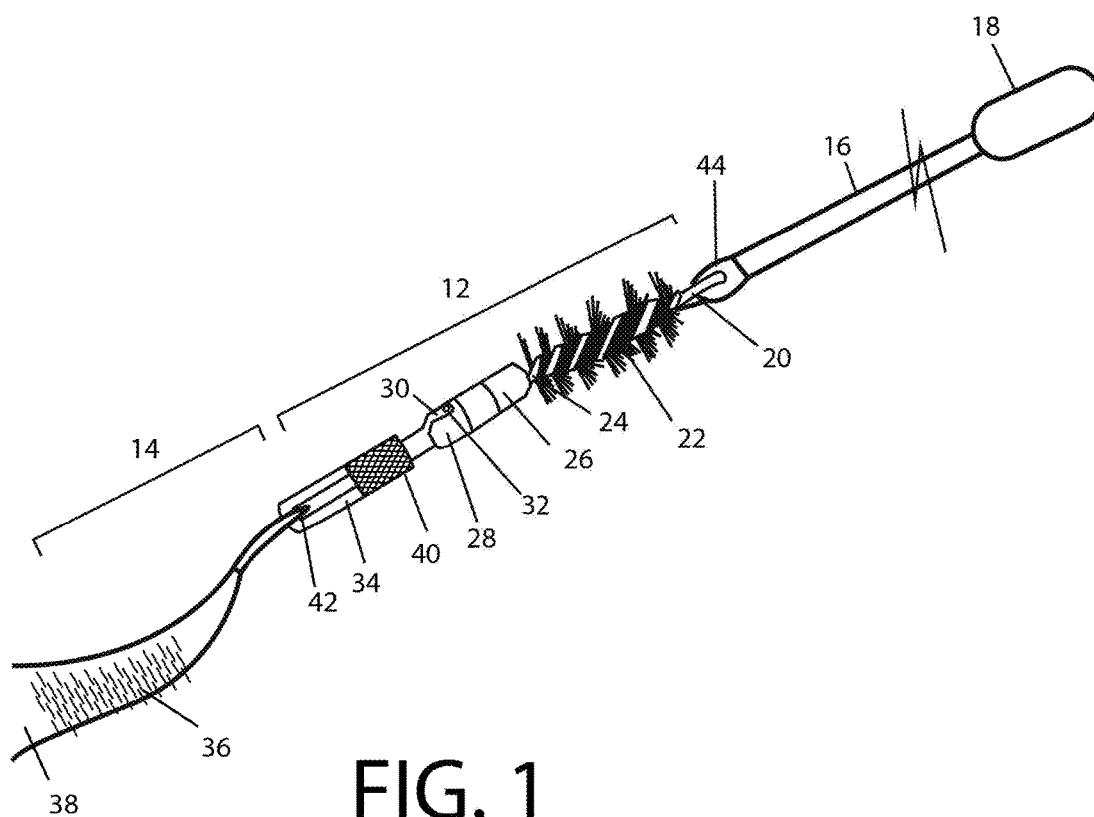
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(57)

ABSTRACT

A gun bore cleaner comprising a scrubber segment, a brush assembly segment and a cord segment. The central brush assembly is flexible or hinged so that it can bend and can be inserted into the narrow breech of a firearm without partial disassembly of the firearm. There is a brush integral to the brush assembly and bristles emanating from the scrubber assembly. The scrubber assembly, brush assembly and cord are separable for cleaning and substitution for bristle and brush diameter to be compatible with varying bore dimensions.





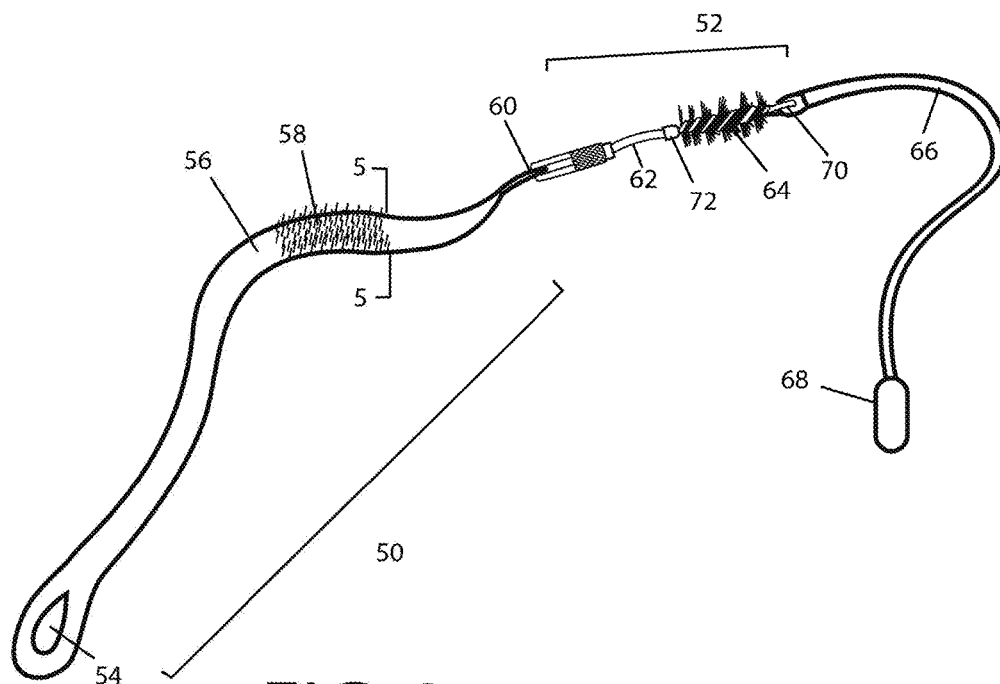


FIG. 3

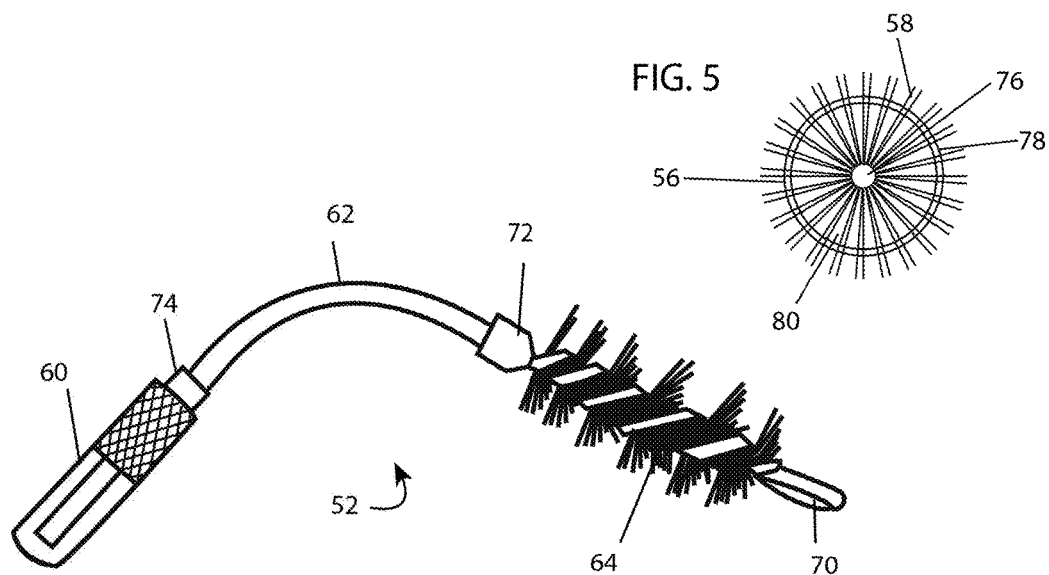


FIG. 4

GUN BORE CLEANER

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to firearm maintenance, and more particularly, to a gun bore cleaner device and method of use.

2. Description of the Related Art

[0002] Several designs for gun cleaning devices have been designed in the past. None of them, however, includes a joint or flexible section that permits entry of the gun bore cleaner through the breech without removing the bolt or other gun assembly.

[0003] Applicant believes that the closest reference corresponds to commercially available bore cleaners. However, it differs from the present invention because all prior bore cleaning devices require partial disassembly of the gun prior to insertion of the gun cleaning tool and do not have the plural and interchangeable brushes along with a machine washable scrubber section.

[0004] Other patents and prior art describe related subject matter and the provide for a number of more or less complicated features that fail to solve the problem in an efficient and economical way. None of these patents suggest the novel features of the present invention.

[0005] A brief abstract of the technical disclosure in the specification and title are provided as well for the purposes of complying with 37 CFR 1.72 and are not intended to be used for interpreting or limiting the scope of the claims.

[0006] Without limiting the scope of the invention, a brief summary of some of the claimed embodiments of the invention is set forth below. Additional details of the summarized embodiments of the invention and/or additional embodiments of the invention may be found in the detailed description of the invention below.

SUMMARY OF THE INVENTION

[0007] It is one of the main objects of the present invention to provide an effective gun bore cleaner that does not require firearm disassembly prior to use.

[0008] It is another object of this invention to provide a gun bore cleaner that is easily convertible to different caliber or gauge of weapon.

[0009] It is still another object of the present invention to provide a gun bore cleaner that has a machine washable scrubber section with a jointed for flexible brush assembly segment between the scrubber assembly and the cord.

[0010] It is yet another object of this invention to provide such a device and method of use that is inexpensive to manufacture and maintain while retaining its effectiveness.

[0011] Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

[0012] These and other embodiments which characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages and objectives obtained by its use, reference can be made to the drawings which form a further part hereof and the accom-

panying descriptive matter, in which there are illustrated and described various embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] With the above and other related objects in view, the invention consists in the details of construction and combination of parts as will be more fully understood from the following description, when read in conjunction with the accompanying drawings in which:

[0014] FIG. 1 shows a perspective view of a gun bore cleaner.

[0015] FIG. 2 shows a perspective view of a brush assembly.

[0016] FIG. 3 shows a perspective view of a gun bore cleaner.

[0017] FIG. 4 shows perspective view of a brush assembly.

[0018] FIG. 5 shows an elevation view of a cross section of a brush from the position identified in FIG. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0019] While this invention may be embodied in many different forms, there are described in detail herein specific embodiments of the invention. This description is an exemplary of the principles of the invention and is not intended to limit the invention to the particular embodiments illustrated and described.

[0020] For the purpose of this disclosure, like reference numerals in the figures shall refer to like features unless otherwise indicated or is obvious by context.

[0021] The subject device and method of use is sometimes referred to as the device, the invention, the gun bore cleaner, the cleaner, the bore cleaner, the system, machine or other similar terms. These terms may be used interchangeably as context requires and from use the intent becomes apparent. The masculine can sometimes refer to the feminine and neuter and vice versa. The plural may include the singular and singular the plural as appropriate from a fair and reasonable interpretation in the situation.

[0022] Referring now to the drawings, where the present invention is generally referred to in FIG. 1 with numeral 10, it can be observed that it basically includes a brush assembly 12, a scrub assembly 14, a cord 16, a weight 18, an eye 20, a brush 22, a spine 24, a connector 26, a tang 28, a clevis 30, a pin 32, an eye 34, bristles 36, a scrubber 38, a connector 40, a loop 42 and a loop 44.

[0023] The two main assemblies, the scrub assembly 14 and the brush assembly 12 are connected to each other, end to end. One end of the scrub assembly 14 has a loop 42 that engages into the eye 34. The eye 34 is preferably openable so that the loop 42 can be removed from the eye 34 thereby separating the scrub assembly 14 from the brush assembly 12 for maintenance and cleaning.

[0024] Looking at FIGS. 3-5 where a version of the invention is shown to include, among other features unique to this version and common to other versions, a scrub assembly 50, a brush assembly 52, a loop 54, a scrubber 56, bristles 58, a connector 60, a segment 62, a brush 64, a cord 66, a weight 68, a connector 70, a connector 72, a crimp 74, a spine 76, a sidewall 78 and an interior 80.

[0025] Looking more closely at the scrub assembly, versions are partially seen in FIG. 1 and another similar, more

complete in FIG. 3, are shown along with an exemplary cross section in FIG. 5 from the perspective noted in FIG. 3. The scrubber 38 in FIG. 1 is comparable to the scrubber 56 in FIG. 3. Similarly, the bristles 36 in FIG. 1 are similar to the bristles 58 in FIGS. 3 and 5.

[0026] The cross section in FIG. 5 of the scrub assembly 50 can be seen to include a flexible sidewall 78 essentially forming a tube. In the interior 80 of the sidewall 78 is a spine 76 that holds the bristles 58. Generally, the bristles 58 radiate outward from the spine 76 and penetrate through the sidewall 78 where a segment of the bristles 58 are exposed outside of the sidewall 78.

[0027] The bristles 58 penetrate the sidewall 78 through small perforations in the sidewall 78. The perforations may be found between the weave or knit from which the scrubber 56 sidewall 78 is fabricated. The sidewall may be made of fabric or other flexible, absorbent and durable material. The flexibility is useful to allow the scrubber 56 to navigate into the narrow breech or bore and through the barrel of the weapon being cleaned. The absorbent nature allows the scrubber to absorb a powder solvent, cleaning fluid, oil, degreaser or other maintenance fluid. Absorbency also may allow the detritus built up inside the barrel to be brought out of the barrel carried by the scrubber 56 material.

[0028] The overall diameter of the sidewall 78 is variable depending on the bore size or caliber of the firearm that the device is adapted to clean. Similarly, the length of the bristles 58 on radii emanating from the spine 76 are commensurate with the bore size or diameter and the caliber of the firearm. Preferably the diameter of the sidewall 78 is sufficient to provide frictional resistance sufficient to scrub the inside of the firearm barrel.

[0029] The diameter of the bristles 58, contained axially inside the scrubber 56, are also dimensioned to contact the inside of the firearm barrel in which they are inserted during the cleaning process so as to brush and scrape the barrel during the cleaning process.

[0030] Where the bristles 58 scrape, the scrubber 56 carries away grime and debris from inside the barrel. The bristles 58 and scrubber act in concert to clean the interior of the barrel down to clean metal. The scrubber 56 may be made of fabric, possibly in a similar fashion as a traditional shoelace that has an open interior. This way the spine 76 holding the bristles 58 can fit axially inside of the scrubber 56 sidewall 78.

[0031] The spine 76 is generally a rigid segment that gives structure to the bristle 58 orientation. The spine 76 may be made of a material such as plastic into which the bristles 58 are attached about perpendicular to the axis of the spine 76. Alternate construction methods may employ a twisted wire as the spine 76 that holds the bristles 58 in the twists.

[0032] The brush assembly 12 is generally between the eye 34 on the connector 40 and continues toward the eye 20 on the end of the brush 22. In this sense the brush assembly 12 on one end connects to the scrub assembly 14 with the eye 34 and the loop 44 on the cord 16 with the eye 20. The loop 44 may be separable from the eye 20 for maintenance, cleaning and to supply a new size brush 22 adapted to a specific caliber or gauge of firearm barrel.

[0033] A problem with the prior art is that the length of the analogous element of the brush assembly 12 is rigid and will not materially flex. The length in the prior art is typically several inches. The prior art will not be insertable into many breeches during the cleaning and lubricating process. To be

used with many firearms, the prior art requires partial disassembly of the bolt, magazine or parts of the receiver to be able to navigate being inserted into the barrel so cleaning may be performed.

[0034] A solution is needed to have a gun bore cleaner that is compatible with any firearm so that it can be cleaned without disassembly of the firearm. Part of the solution comes in making the brush assembly 12 or 52 flexible so that it can bend as it enters the breech. In other words, the brush assembly 12 or 52 can turn the corner into the barrel of the gun without removal of parts of the firearm.

[0035] In the embodiment of the inventive concept as depicted in FIGS. 1 and 2, there is a hinge comprised of a clevis 30 fit over the tang 28 and fixed together with the pin 32. The connector 40 is thereby articulable about the pin 32 relative to the connector 26. The brush assembly 12 can thereby bend and flex to enter or exit a narrow orifice in the breech as the bore cleaner is fed into the barrel for cleaning and lubrication of the firing mechanism and barrel.

[0036] Similarly, another embodiment of the brush assembly 52 is shown generally in FIG. 3 and in detail in FIG. 4. The brush assembly 52 includes a segment 62 between the connector 60 and the connector 72. The connector 60 removably connects to an end of the scrubber 56. The connector 72 joins the segment 62 and the brush 64. The brush 64 at the other end includes a connector 70 that joins the brush 64 to the cord 66 either removably or permanently.

[0037] The segment 62 is characterized with a degree of flexibility so that it too can navigate entry and exit from the breech of a firearm while cleaning and lubricating the barrel. The segment 62 may be fabricated of a segment of metal cable that is crimped to the connector 60 at crimp 74 and to the brush 64 at connector 72. Alternative materials for the segment could be plastic, similar to a heavy gauge monofilament line, a plastic tube, a wire or any other such material that is durable and flexible enough to readily bend when entering or exiting the breech of a firearm. The segment 62 optionally should also retain a degree of rigidity sufficient to allow it to be pushed into the breech while inserting the scrubber 56 or cord 66 into the barrel during cleaning and maintenance of the firearm.

[0038] In a typical use of the gun bore cleaner the weight 18 is inserted into the barrel of the firearm from either end. The cord 16 is flexible, for example a rope, cord, cable, wire or line. The weight 18 is dimensioned to easily fit through the barrel yet have enough mass to lead the cord 16 through the barrel. Once the cord 16 is completely through the barrel it can be pulled from the weight 18 end so that the trailing brush assembly 12 and scrub assembly 14 are forcefully led through the barrel. An optional loop at the end of the scrubber 38, similar to the loop 54 on the version of the invention shown in FIG. 3, can be used to pull the entire device in the other direction.

[0039] By this means a back-and-forth motion of the device can cause the brush 22, bristles 36 and scrubber 38 to repeatedly pass through the barrel in a short amount of time. This reciprocating action, along with an optional power residue solvent, lubricant or other gun cleaning preparation, can be used to completely remove all build up and residue. This leaves the firearm in a safe condition ready for use or storage.

[0040] By inclusion of the flexible segment 62 or the hinged assembly comprised of the clevis 30, tang 28 and pin 32, in combination with the inherent flexibility of the of

scrubber **38** and cord **16** (alternatively the analogous scrubber **56** and cord **66**) the entire device can be threaded from the tip of the barrel and be pulled entirely through the barrel and out of the breech without removing parts of the firearm nearer to the breech and trigger assembly.

[0041] The versions of the device in FIGS. **1** and **3** are similar in that the scrubber assembly **14** or **50** may be removed from the brush assembly **12** or **52**, respectively, at the eye **34** or connector **60**. This allows the absorbent scrub assembly **14** or **56** to be washed and cleaned. Machine washing is expected and hand washing would also be effective. Further, this separation feature can allow a different scrub assembly **14** or **50** with differing sized bristles **36** or **58** to be utilized that more appropriately match the inside dimension of the barrel. For example, a twenty gauge shotgun would be better cleaned with a smaller diameter bristles than a twelve gauge shotgun.

[0042] The length and diameter of the bristles **36** or **58** and brush **22** or **64** may also be different depending on the diameter of the barrel being cleaned. For some applications the material from which the brush **22** or **64** is made may differ. For example, some users may prefer stainless steel, brass, other alloy or plastic. The selection may be based on the material of the barrel and the operator's preference for a particular material for suitability, cost or durability.

[0043] A version of the invention can be fairly describes as a gun bore cleaner comprised of a scrubber assembly, a brush assembly and a cord. The scrubber assembly is comprised of a first elongated member between a first end and a second end. At the first end of the scrubber assembly is a first loop. Along a predefined segment of the first elongated member a plurality of bristles radiate around and extend beyond an exterior surface of the first elongated member used to scrub the interior of a gun barrel. The brush assembly is comprised of a second elongated member terminating on a first end with a first eye and on a second end with a second eye. Between the first eye and second eye is a brush coaxial to the second elongated member and a hinge adapted such that the second elongated member can bend when inserted into a predetermined firearm barrel. The brush has bristles that radiate axially entirely around the brush to contact the entire circumference of the barrel. The cord is comprised of a third elongated member terminating at a third end with a second loop and a fourth end with a weight dimensioned to fit and slide within the barrel. The first loop is removably connected to the first eye. The second loop is removably connected to the second eye. The scrub assembly, the brush and the cord are each dimensionally adapted to snugly fit inside the predetermined firearm barrel for cleaning. Optionally, the device may include that the bristles and brush are fabricated from a material selected from any of: steel, stainless steel, brass, bronze, plastic, aluminum alloy or other material suitable for cleaning the interior of a gun barrel. Optionally the first elongated member readily absorbs a predetermined gun cleaning preparation such as powder solvent, lubricant or other cleaning and preserving formula.

[0044] A version of the present invention can be fairly described as a gun bore cleaner comprised of a scrubber assembly, a brush assembly and a cord. The scrubber assembly is comprised of a first elongated member between a first end and a second end. The first end of the scrubber assembly has a first loop. Along a predefined segment of the first elongated member a plurality of bristles radiate around and

extend beyond an exterior surface of the first elongated member. The brush assembly is comprised of a second elongated member terminating on a first end with a first eye and on a second end with a second eye. Between the first eye and second eye is a brush coaxial to the second elongated member. The second elongated member is flexible so that it can bend when inserted into a predetermined firearm barrel. The brush has bristles that radiate axially entirely around the brush. The cord is comprised of a third elongated member terminating at a third end with a second loop and a fourth end with a weight. The first loop is removably connected to the first eye. The second loop is removably connected to the second eye. The scrub assembly, the brush and the cord are each dimensionally adapted to fit inside the predetermined firearm barrel for cleaning. Optionally, the bristles and brush are fabricated from a material selected from any of: steel, stainless steel, brass, bronze, plastic or aluminum alloy. Optionally, the first elongated member readily absorbs a predetermined gun cleaning preparation.

[0045] The foregoing description conveys the best understanding of the objectives and advantages of the present invention. Different embodiments may be made of the inventive concept of this invention. It is to be understood that all matter disclosed herein is to be interpreted merely as illustrative, and not in a limiting sense.

What is claimed is:

1. A gun bore cleaner comprised of a scrubber assembly, a brush assembly and a cord;
 - the scrubber assembly is comprised of a first elongated member between a first end and a second end;
 - the first end of the scrubber assembly has a first loop;
 - along a predefined segment of the first elongated member a plurality of bristles radiate around and extend beyond an exterior surface of the first elongated member;
 - the brush assembly is comprised of a second elongated member terminating on a first end with a first eye and on a second end with a second eye;
 - between the first eye and second eye is a brush coaxial to the second elongated member and a hinge adapted such that the second elongated member can bend when inserted into a predetermined firearm barrel;
 - the brush has bristles that radiate axially entirely around the brush;
 - the cord is comprised of a third elongated member terminating at a third end with a second loop and a fourth end with a weight;
 - the first loop is removably connected to the first eye;
 - the second loop is removably connected to the second eye;
 - the scrub assembly, the brush and the cord are each dimensionally adapted to snugly fit inside the predetermined firearm barrel for cleaning.
2. The gun bore cleaner as in claim **1** further characterized in that the bristles and brush are fabricated from a material selected from any of: steel, stainless steel, brass, bronze, plastic or aluminum alloy.
3. The gun bore cleaner as in claim **1** further characterized in that the first elongated member readily absorbs a predetermined gun cleaning preparation.
4. A gun bore cleaner comprised of a scrubber assembly, a brush assembly and a cord;
 - the scrubber assembly is comprised of a first elongated member between a first end and a second end;
 - the first end of the scrubber assembly has a first loop;

along a predefined segment of the first elongated member a plurality of bristles radiate around and extend beyond an exterior surface of the first elongated member;

the brush assembly is comprised of a second elongated member terminating on a first end with a first eye and on a second end with a second eye;

between the first eye and second eye is a brush coaxial to the second elongated member;

the second elongated member is flexible so that it can bend when inserted into a predetermined firearm barrel;

the brush has bristles that radiate axially entirely around the brush;

the cord is comprised of a third elongated member terminating at a third end with a second loop and a fourth end with a weight;

the first loop is removably connected to the first eye;

the second loop is removably connected to the second eye;

the scrub assembly, the brush and the cord are each dimensionally adapted to fit inside the predetermined firearm barrel for cleaning.

5. The gun bore cleaner as in claim **4** further characterized in that the bristles and brush are fabricated from a material selected from any of: steel, stainless steel, brass, bronze, plastic or aluminum alloy.

6. The gun bore cleaner as in claim **4** further characterized in that the first elongated member readily absorbs a predetermined gun cleaning preparation.

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