

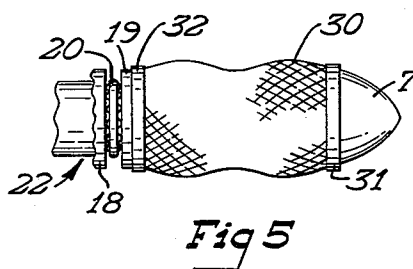
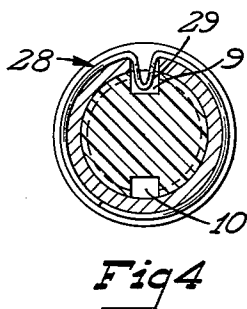
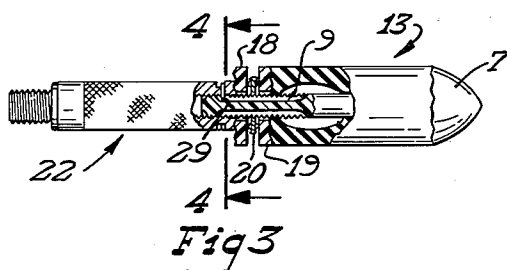
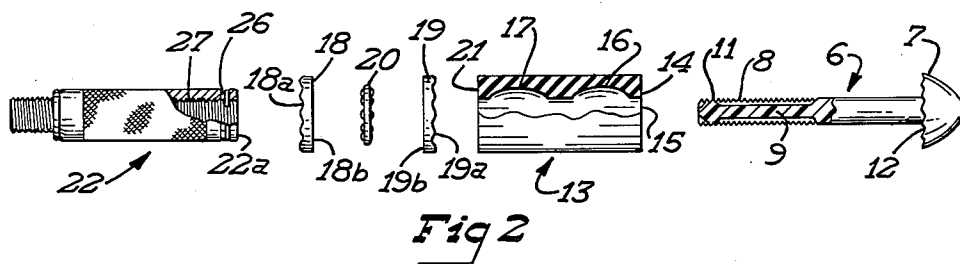
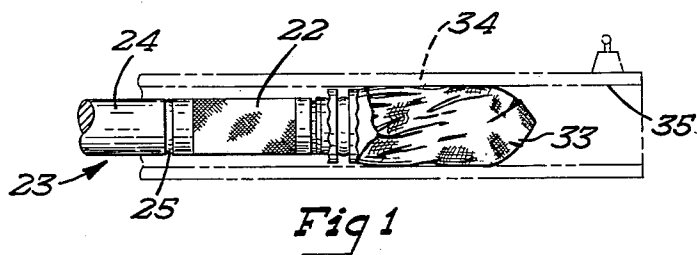
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EXPANDIBLE GUN CLEANER

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3,064,294

EXPANDIBLE GUN CLEANER

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This invention relates to a gun cleaning device. More particularly it relates to a gun cleaning device adjustable for use in cleaning guns of various gauges.

The usual method of cleaning a shot-gun is to use a cleaning rod having a slotted tip through which a rag is pulled. Sometimes round patches are folded over the tip of the rod rather than through the slot. To clean efficiently, the rag or patch must fit snugly in the barrel so that the barrel may be scrubbed by pushing and pulling the rod with a back and forth motion within the barrel. Sizing and bunching a rag pulled through the slot is somewhat difficult and two or more patches must be used when the patches are folded over the rod tip. With either method, the folding and bunching of the cloth makes high spots of cloth which contact the barrel and low spots which do not contact the barrel. This leaves streaks in the barrel in the cleaning operation which must be cleaned by additional repeated operations.

If a sufficient number of patches are not used over the tip of the rod, the patches will slip off the tip when the rod is pulled backward to scrub the barrel. As a result, such patches are good for only a forward pass through the barrel without reapplication thereof to the end of the rod. When sufficient patches are used for a tight snug fit, they must be forced through the constriction of the choke of the gun with considerable strength or by a pounding with the heel of the hand on the end of the cleaning rod. This can cause undue wear and possible damage to the choke.

The usual method of cleaning a shot-gun with the above equipment is to first scrub the barrel with cloth or patches soaked in powder solvent. Following this, dry cloths or patches are used to wipe out the dissolved fouling. This process must be repeated until a dry patch fitted snug in the barrel comes out clean, thereby showing that there is no fouling left in the barrel. These patches are relatively expensive when used in large quantities as is powder solvent, a considerable amount of which must be used when a rag is utilized.

As indicated above, a considerable amount of solvent must be used when multiple patches or a large rag is utilized in the cleaning operation. The entire rag or all of the patches become dirty and cannot be reused or they will recontaminate the barrel. Even when using dry patches, the under patches become soiled at the edges and cannot be reused in the final stages of cleaning.

It is a general object of my invention to provide a novel and improved gun cleaner of simple and inexpensive construction and operation.

A more specific object is to provide a novel and improved gun cleaning device which can be manufactured very inexpensively and may be utilized safely without danger of scoring the interior of the gun barrel.

Another object is to provide a novel and improved gun cleaning device which requires a minimum of cleaning patches to effect efficient cleaning of the gun barrel and which will apply pressure to the cleaning patch evenly along a considerable length while within the gun barrel to thereby increase the effective cleaning surface thereof.

Another object is to provide a novel and improved gun cleaner constructed inexpensively and in such a manner that it may be readily expanded and contracted while within the gun barrel.

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Another object is to provide a novel and improved gun cleaning device of simple and inexpensive construction which will preclude separation of the threaded sections of the cleaning rod in the event the rod is turned about its longitudinal axis.

Another object is to provide an improved gun cleaner which facilitates the cleaning operation so that it may be accomplished in less time than with gun cleaning devices heretofore known.

Another object is to provide an improved gun cleaning device constructed to facilitate the formation of symmetrical folds in the cleaning patches to thereby apply a uniform and effective cleaning surface to the interior of the gun barrel.

Another object is to provide a novel and improved gun cleaning device having inherent means for apprising the user of the extent of variations made by him in the pressure applied against the interior of the gun barrel through the cleaning patch.

These and other objects and advantages of this invention will more fully appear from the following description, made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is a vertical sectional view of a section of a gun barrel with my gun cleaner shown in side elevation within the interior thereof and illustrating the sleeve configuration when under compression.

FIG. 2 is an exploded view showing the individual parts of my gun cleaner in side elevation with portions thereof broken away to show the construction in vertical section.

FIG. 3 is a vertical sectional view of my gun cleaner assembled with the compression about to be applied to the rubber sleeve.

FIG. 4 is a cross-sectional view taken along line 4—4 of FIG. 3.

FIG. 5 is a side elevational view of my gun cleaner with the metal sleeve thereon and snugly affixed thereto by compression and expansion of the rubber sleeve.

One embodiment of my invention, as I have shown in FIGS. 1—5, includes a compressing member 6 in the form of a mandrel having a rounded head element 7 and a threaded end portion 8 at the opposite end thereof. A pair of oppositely disposed longitudinally extending grooves 9 and 10 are formed in the threaded exterior surface of the portion 8. It will be noted that the grooves 9 and 10 are interrupted adjacent the extreme end of the threaded portion 8 so that the threads are continuous for several turns at 11. This compression member 6 is preferably formed of a hard plastic material such as nylon. The head element 7 is preferably provided with gripping elements 12 which, as shown, may be in the form of serrations extending axially, or may be in the form of axially extending pins embedded in the head 7, or be formed of other well known means.

Slidably mounted on the shank of the compression member 6 is a tubular member 13 which is preferably formed of rubber or similar flowable material which is resilient and compressible and has a high resistance to oils and the like. The rubber from which the sleeve or tubular member 13 is formed is preferably of the neoprene type. This sleeve 13 has an end portion 14 which bears against the serrations 12 and is gripped thereby to prevent relative rotability between the elements 6 and 13.

The bore of the tubular member 13 is the same diameter or only slightly larger than the exterior circumference of the threaded portion 8 and shank of the element 6. The interior surface of the tubular member 13 which defines the bore 15 has a pair of circumferentially extend-

ing recesses 16 and 17 formed therein. These recesses are in the form of annular grooves which are spaced longitudinally of the sleeve 13.

Carried by the compression member 6 is a pair of plastic washers 18 and 19 each of which has a serrated side indicated as 18a and 19a, respectively, and a smooth side indicated as 18b and 19b, respectively. Disposed between the two washers 18 and 19 and also carried by the shank of the compression member 6 is a thrust-bearing 20 which consists of an annular channel within which is maintained a plurality of circumferentially spaced metal balls. This type of bearing is well known and is readily procurable. The serrated side 19a of the washer 19 bears against the opposite end 21 of the tubular member 13 while the smooth side 19b bears against the thrust-bearing 20. The smooth side 18b of the washer 18 bears against the opposite side of the bearing 20 while the serrated side 18a bears against the outer end 22a of the bushing 22.

The bushing 22 is in effect a section of the cleaning rod indicated generally by the numeral 23. The cleaning rod, of course, includes at least one additional section 24. Disposed between the two sections 22 and 24 is a rubber O-ring 25 which I have found functions very efficiently as a lock washer.

The exterior of the bushing 22 is provided with a circumferential groove 26 adjacent the end 22a. The bushing 22 is interiorly threaded with threads 27, these threaded portions being adapted to threadedly connect the rod 23 with the compression member 6 by cooperatively engaging the threads of the threaded end portion 8. It will be readily appreciated that turning the bushing 22 in a clockwise direction relative to the compression member 6 will apply longitudinal compression to the sleeve 13. Counter-clockwise turning of the same will reduce such compression.

Mounted within the groove 26 is an annular split detent spring 28 which has a radially inwardly extending finger 29. This groove 26 and the spring 28 are positioned relative to the threads of the bushing 22 and the compression member 6 so that the finger 29 rides in the channels between the threads of the threaded end portion 8 and slips into the longitudinally extending grooves 9 and 10 with a resounding click at each half turn of the bushing 22 relative to the compression member 6.

FIG. 5 shows a sleeve member formed of elastically woven fabricated metal such as metal screening. In FIG. 5, the opposite ends of the sleeves are provided with a pair of metal bands 31 and 32 which prevent the edges of the screen from fraying and scratching the interior of the barrel. The material from which this sleeve 30 is made is preferably relatively soft so that serious damage through its usage cannot result by scoring of the gun barrel and yet its abrasive qualities may be utilized to effectively loosen persistent lead deposits within the gun barrel.

In use, a patch 33 is folded over the head element and, due to the dome-shaped head and cylindrical sleeve, assumes substantially symmetrical folds. The gun cleaner, which has been somewhat expanded by compression of the sleeve 13 is then thrust in the barrel 34, to test the relative diameters. The rod member 23 is turned relative to the compression member 6 until the patch and gun cleaning device is snugly and firmly engaged by the internal surface of the gun barrel.

This snug-fit relationship, of course, is the result of the longitudinal compression applied to the sleeve 13 which in turn causes the sleeve to increase in exterior diameter, as best shown in FIG. 1. Because of its flowability, however, the actual shape assumed by the sleeve tends to conform to the interior surface of the gun barrel so that pressure is more equally applied throughout the length of the sleeve 13. The recesses 16 and 17, would cause the sleeve 13 to bulge considerably more at its opposite end portions if the sleeve were unconfined, but

because of the fact that it is confined by the gun barrel and the sleeve is made of a flowable material, the gun barrel will be engaged more uniformly by the sleeve 13 and patch throughout the length of the latter through the patch 33.

It will be seen that a single patch at a time may be utilized to accomplish the gun cleaning operation for the rod may be moved back and forth to effect a scrubbing action with a single dry patch or with a patch to which a solvent has been applied. Since the sleeve 13 is of rubber and has greater adhesive qualities than the material of the gun barrel, the patch will remain adhered to the sleeve 13 despite the back and forth motion within the barrel.

When the restricted section of the gun barrel, normally found at the choke area indicated by the numeral 35 is reached, compensation may be made for the restricted diameter of the gun barrel in this area by merely turning the rod 23 in a counter-clockwise direction until the sleeve 13 and the patch 33 will slip into that area in a snug fit but without sufficient pressure to damage the choke. The extent to which it is necessary to turn the rod 23 relative to the compression member 6, may be gauged by counting the number of clicks provided by the tongue 29 as it slips into the grooves 9 and 10.

The gun cleaner is forced outwardly through the open end of the choke area 35 a sufficient distance until the end 14 of the sleeve 13 extends slightly therebeyond at which point it is retracted. After the choke area has been cleaned the patch may be withdrawn from that area to the less restricted bore of the gun barrel at which point the diameter of the cleaning device may again be increased to the exact previous dimensions utilized by merely turning the rod 23 in a clockwise direction until the same number of clicks are felt or heard as was felt or heard when the diameter was reduced. From this it can be readily seen that it is possible to clean the gun barrel in a more efficient and effective manner without necessitating removal of the gun cleaner to vary the diameter and without danger of damaging the choke area. It will be noted that the indication of the extent of relative turning between the rod 23 and the compression member 6 may be felt in the rod 23 as well as heard, for the slipping of the tongue into the grooves 9 and 10 will cause a vibration which is transmitted through the rod.

It will also be noted that through the use of the thrust bearing 20, it is possible to adjust the effective diameter of the gun cleaner while it is within the gun barrel without danger of disconnecting sections of the gun cleaning rod and thereby causing a substantial loss of time and considerable inconvenience and annoyance. The bearing 20 reduces the friction which normally exists between the section 22 of the rod and the sleeve 13 to a point where it is substantially less than the friction between the section 22 and the section 24 of the rod. This means that the effective diameter of the sleeve 13 may be varied at will. In this connection, the rubber O-ring 25 provides added restraint against relative turning between the sections 22 and 24 of the rod 23.

One of the additional advantages of my gun cleaning device lies in the fact that it may be readily applied to a standard cleaning rod so that a present owner of such a rod needs only to purchase the bushing 22 and the compression member 6 along with the sleeve 13, and the bearing 20, the two washers 18 and 19, and the spring 28.

Another additional advantage of my gun cleaning device lies in the fact the head element is formed of a material softer than the material of the gun barrel, thereby effectively precluding scoring of the interior of the gun barrel which sometimes takes place with conventional gun cleaning devices heretofore known, particularly when the patches slip to one side and cause the cleaning tip of the rod to engage the interior of the barrel. The round shape and the relatively soft material of the head element

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7 effectively precludes such scoring damage. Moreover, the head element 7 in combination with the sleeve 13, centers the rod in the bore of the gun so that the rod itself cannot contact and damage the gun bore except at the extreme end of the chamber of the gun where such contact will do no harm.

If, after cleaning, it is noted that there are stubborn lead deposits on the interior of the gun barrel, as is sometimes the case with guns which have not been properly cared for, such deposits may be readily loosened through the use of the sleeve 30. This sleeve 30 is readily slipped onto the tubular member 13 before tension is applied by longitudinal compression of the tubular member 13. The expansion of the sleeve 13 will hold the sleeve 30 in fixed relation thereto.

It may be noted that the ends of the grooves 9 and 10 close to the extreme end of the threaded portion 8 commence at a point where the washers 18 and 19 and the bearing 20 will be brought to bear against each other and against the end 21 of the sleeve 13 by tightening of the bushing 22 on the threaded portion 8 of the compression member. Thus when the first click is heard, the parts of the device will fit snugly relative to each other and for each additional click compression is being applied longitudinally to rubber sleeve 13.

It will, of course, be understood that various changes may be made in form, details, arrangement and proportions of the parts without departing from the scope of my invention which consists of the matter shown and described herein and set forth in the appended claims.

What is claimed is:

1. A gun cleaning device comprising an elongated compression member having a threaded end portion, a head element carried by said member at its opposite end portion, a tubular member made of resilient compressible material mounted on said compression member in surrounding relation and having one end portion transmitting pressure against said head element, a rod member threadedly connected to said threaded end portion of said compression member and applying pressure against the opposite end portion of said tubular member, and means associated with said compression member for indicating each time said compression member is turned one complete turn about its longitudinal axis relative to said rod member.

2. A gun cleaning device comprising an elongated compression member having a threaded end portion, a head element carried by said member at its opposite end portion, a tubular member made of resilient compressible material mounted on said compression member in surrounding relation and having one end portion transmitting pressure against said head element, a rod member threadedly connected to said threaded end portion of said compression member and applying pressure against the opposite end portion of said tubular member, and means carried by said rod member and said compression member for audibly indicating each time said compression member is turned one complete turn about its longitudinal axis relative to said rod member.

3. A gun cleaning device comprising an elongated compression member having a threaded end portion, a head element carried by said member at its opposite end portion, a tubular member made of resilient compressible material mounted on said compression member in surrounding relation and having one end portion transmitting pressure against said head element, a rod member threadedly connected to said threaded end portion of said compression member and adapted to apply pressure against the opposite end portion of said tubular member when turned relative to said compression member in a predetermined direction, said compression member having a longitudinally extending groove formed in its threaded end portion and interrupting the thread thereof, and a resiliently inwardly urged indicator element carried by said rod member and bearing against the grooved

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threaded end portion of said compression member as said rod member is rotated relative to said compression member about the longitudinal axis of the latter whereby an indication will be given each time said rod member is turned one complete turn relative to said compression member.

4. A gun cleaning device comprising an elongated compression member having a threaded end portion, a head element carried by said member at its opposite end portion, a tubular member made of resilient compressible material mounted on said compression member in surrounding relation and having one end portion transmitting pressure against said head element, a rod member threadedly connected to said threaded end portion of said compression member and adapted to apply pressure against the opposite end portion of said tubular member when turned relative to said compression member in a predetermined direction, said compression member having a longitudinally extending groove formed in its threaded end portion and interrupting the thread thereof, and a resiliently inwardly urged indicator element carried by said rod member and riding between the threads of said compression member and into the confines of said groove as said rod member is rotated relative to said compression member about the longitudinal axis of the latter whereby an indication will be given each time said rod member is turned one complete turn relative to said compression member.

5. The structure defined in claim 4 wherein the indication given by said indicator element is audible.

6. The structure defined in claim 4 wherein the end of said groove adjacent the end of said threaded end portion of said compression member is located at the position where said rod member commences to apply longitudinal compression to said tubular member.

7. The structure defined in claim 4 wherein said rod member is composed of a pair of threadedly connected sections, and a ring made of resilient compressible material disposed between said two sections to preclude loosening of the threaded connection between said two sections when said rod member is attempted to be rotated relative to said compression member about the longitudinal axis of the latter.

8. A gun cleaning device comprising an elongated compression member having a threaded end portion, a head element carried by said member at its opposite end portion, a sleeve made of resilient compressible material mounted on said compression member in encasing relation and having one end portion transmitting pressure against said head element, a rod member threadedly connected to said threaded end portion of said compression member and adapted to apply pressure against the opposite end portion of said sleeve when turned relative to said compression member in a predetermined direction, one of said members having a recess formed in its threaded connection with the other, and a resiliently urged indicator element carried by the other of said members opposite said recess and alternately riding into and out of said recess as said rod member is rotated relative to said compression member about the longitudinal axis of the latter whereby an indication will be given each time said rod member is turned one complete turn relative to said compression member.

9. A gun cleaning device comprising an elongated compression member having a threaded end portion, a head element carried by said member at its opposite end portion, a tubular member of uniform external diameter throughout its length when in free form and made of resilient compressible material mounted on said compression member in surrounding relation and having one end portion transmitting pressure against said head element, a rod member threadedly connected to said threaded end portion of said compression member and applying pressure against the opposite end portion of said tubular member, a bearing member disposed between said rod

member and said tubular member whereby variation of the longitudinal compression applied to said tubular member may be facilitated, said bearing member including a plurality of freely rotatable ball elements extending axially outwardly from opposite sides thereof, and a pair of washers carried by said compression member in pierced relation and bearing against opposite sides of said ball elements, one of said washers being disposed between said tubular member and said bearing and the other of said washers being disposed between said bearing and said rod member.

10. The structure defined in claim 9 wherein each of said washers has a relatively smooth surface engaging said ball elements to promote relative turning movement therebetween, said first mentioned washer having a relatively rough gripping surface engaging said tubular member and said second mentioned washer having a relatively rough gripping surface engaging said rod member to prevent relative movement therebetween.

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