A firearm barrel cleaning shell including a casing carrying a primer at one of its ends and having an opening at the other of its ends. A blast conduit is positioned within the casing so as to receive the discharge from the primer and to direct the discharge toward the opening in the casing. A projectile is positioned within the casing and includes an ejectable plug that, before the discharge of the primer, closes the opening in the casing. A flexible tether connects the plug to an oil-saturated pad is positioned adjacent the primer and a solvent-saturated pad positioned between the plug and the oil-saturated pad.
FIREARM BARREL CLEANING SHELL

FIELD OF THE INVENTION

The present invention relates generally to ammunition and explosives and, more particularly, to cartridges with bore cleaning means.

BACKGROUND OF THE INVENTION

Cleaning the barrel of a firearm has never been easy. Typically, long-handled brushes and similar tools carrying powerful solvents are used to manually scrub the internal surface of a firearm barrel. Afterward, oil is placed in the barrel to inhibit corrosion and excess oil is wiped up to prevent marring of the gunstock. The process can be tedious and time-consuming and, if poorly performed, can result in the premature deterioration of the firearm. In extreme cases, the firearm can be rendered inoperative.

SUMMARY OF THE INVENTION

In light of the problems associated with the known methods and apparatus for cleaning the barrels of firearms, it is a principal object of the invention to provide a firearm barrel cleaning shell that can quickly and effectively clean the barrel of a firearm. The shell is intuitive to use and can be employed with minimal training and without resort to additional tools.

It is an object of the invention to provide improved elements and arrangements thereof in a firearm barrel cleaning shell for the purposes described which is lightweight in construction, inexpensive to manufacture, and dependable in use.

Briefly, the firearm barrel cleaning shell in accordance with this invention achieves the intended objects by featuring a casing adapted for positioning within the firing chamber of a firearm. The casing carries a primer at one of its ends adapted to explosively discharge gases upon being struck by the firing pin of a firearm and has an opening at the other of the ends. A blast conduit is centrally positioned within the casing defining an annulus between the blast conduit and the casing. The blast conduit has an inner end positioned about the primer so as to receive the discharge from the primer and, also, has an outer end in fluid communication with the inner end for directing the discharge from the primer toward the opening in the casing. A projectile is positioned within the casing and includes an ejectable plug that closes the opening in the casing. A pair of flexible tethers connects the plug to an oiling pad positioned within the annulus adjacent the primer and a number of cleaning pads positioned within the annulus between the plug and the oiling pad.

The foregoing and other objects, features and advantages of the present invention will become readily apparent upon further review of the following detailed description of the preferred embodiment as illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention may be more readily described with reference to the accompanying drawings, in which:

FIG. 2 is a longitudinal cross-sectional view of the firearm barrel cleaning shell of FIG. 1.

FIG. 3 is a side view of a portion of a barrel of a firearm with the projectile of the firearm barrel cleaning shell being discharged therefrom.

FIG. 4 is a perspective view of the projectile of the firearm barrel cleaning shell with portions broken away.

Similar reference characters denote corresponding features consistently throughout the accompanying drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the FIGS., a firearm barrel cleaning shell in accordance with the present invention is shown at 10. Shell 10 includes a casing 12 supporting a primer 14 at one of its ends and having an opening 16 at the other of its ends. A blast conduit 18 is centrally positioned within casing 12 to receive the discharge from primer 14 and to direct the discharge toward opening 16. A projectile 20 is positioned within casing 12 and has an ejectable plug 22 initially closing opening 16. Plug 22 is joined by a pair of tethers 24 to an oiling pad 26 adjacent primer 14. A number of cleaning pads 28a, 28b, 28c, and 28d are connected to tethers 24 between plug 22 and oiling pad 26. When struck by a firing pin, primer 14 explosively discharges gases into conduit 18 and, via conduit 18, against plug 22 with sufficient force to expel projectile 20 from casing 12.

Casing 12 has an end cap 30 from which a tube 32 extends. End cap 30 includes a circular base plate 34 having a central aperture 36 within which primer 14, being a small tube containing explosive typically for firing the main charge of a big gun, is affixed. A retaining sleeve 38 is integrally formed with the periphery of base plate 34 and surrounds primer 14 at a distance. The inner end of tube 32 is tightly wedged within sleeve 38 and the outer end thereof is remote from plate 34. The outer end of tube 32 is provided with an inwardly projecting lip 40 about its periphery that defines opening 16.

Conduit 18 comprises a hollow cylinder 42 having an integral stabilizing hoop 44 at one end of cylinder 42. Cylinder 42 has a diameter sufficient to snugly receive primer 14 within one of its ends and to define an annulus 46 between itself and tube 32. Preferably, the inner end of cylinder 42 having hoop 44 rests against plate 34 and receives primer 14 therein and the outer end of cylinder 42 engages plug 22. The periphery of hoop 44 presses tightly against the inside of tube 32 to ensure that tube 32 cannot exit casing 12 upon discharge of primer 14 and the passage of projectile 20 from casing 12.

Plug 22 is a plastic disk sized to fit snugly within the outer end of tube 32. As shown, plug 22 abuts lip 40 and, prior to discharge of primer 14, is retained by lip 40 within tube 32. Upon discharge of primer 14, the center of plug 22 is hit by primer gasses exiting conduit 18 slightly deforming both plug 22 and lip 40 permitting plug 22 to exit tube 32 through opening 16.
Oiling pad 26 includes a wiper ring 48 to which is bonded an oil applicator ring 50. Wiper ring 48 is formed of impermeable plastic and is initially positioned within annulus 46 abutting hoop 44. Wiper ring 48 is dimensioned to snugly, yet slidably, engage tube 32 along the outer surface of wiper ring 48 and conduit 18 along the inner surface of wiper ring 48. Applicator ring 50 is adhesively fastened to the side of wiper ring 48 facing opening 16 and is separated from hoop 44 by wiper ring 48. Applicator ring 50, like wiper ring 48, is dimensioned to snugly, yet slidably, engage tube 32 and conduit 18. Applicator ring 50 is formed of tightly compacted organic or inorganic fibrous material and is saturated with oil of a kind suitable for treating barrel 52 of firearm 54.

Each of cleaning pads 28a-28d includes a wiper ring 56 having a solvent applicator ring 58 bonded thereto. Each wiper ring 56 is formed of impermeable plastic and is positioned within annulus 46 between plug 22 and oiling pad 26. Each wiper ring 56 is dimensioned to snugly, yet slidably, engage tube 32 along the outer surface thereof and engage conduit 18 along the inner surface thereof. An applicator ring 58, however, is adhesively fastened to the side of each wiper ring 56 facing opening 16. Each applicator ring 58 is dimensioned to snugly, yet slidably, engage tube 32 and conduit 18. Each applicator ring 58 is formed of tightly compacted organic or inorganic fibrous material and is saturated with solvent of a kind suitable for cleaning firearm barrel 52.

Tethers 24 are lengths of string positioned within annulus 46 midway between tube 32 and conduit 18 and 180° apart. Tethers 24 extend from one end of cylinder 42 to the other end and their opposite ends are affixed in a suitable manner to plug 22 and wiper ring 48. Additionally, tethers 24 are affixed to each of wiper rings 56.

A pair of tether segments 24a connect plug 22 to cleaning pad 28d. Prior to the discharge of primer 14, segments 24a are coiled side-by-side within annulus 46 and serve as spacers between plug 22 and cleaning pad 28d. Segments 24a have a length sufficient to permit plug 22 to travel to the end of firearm barrel 52, i.e., about eight times the length of casing 12, upon discharge of primer 14 without pulling upon or moving any of pads 26 or 28a-28d thereby ensuring the highest possible acceleration and initial velocity of pads 26 and 28a-28d through barrel 52.

A pair of tether segments 24b connects each of pads 26 and 28a-28d together in the manner of a train. Prior to the discharge of primer 14, segments 24b are coiled side-by-side within annulus 46 and serve as spacers between pads 26 and 28a-28d. Segments 24b have a length that permits fluid from each one of pads 26 and 28a-28d to contact barrel 52 for a period of time that maximizes the cleaning of barrel 52 before such is wiped away by a trailing one of the pads, i.e., about two times the length of casing 12.

The use of firearm barrel cleaning shell 10 is straightforward. First, shell 10 is loaded into barrel 52 in a conventional manner. Then, with barrel 52 pointed in a safe direction, the trigger of firearm 54 is pulled so as to cause a firing pin to contact primer 14. The impact of the firing pin upon primer 14 causes primer 14 to explosively discharge gases into conduit 18. The gasses are conveyed to plug 22 that is, then, driven forcefully past lip 40 and from opening 16. Now, plug 22 travels down barrel 52 drawing tether segments 24a behind it. When plug 22 reaches the end of barrel 52 and all slack is taken from tether segments 24a, cleaning pad 28d is pulled down barrel 52. A thin film of solvent is applied by applicator ring 56 of cleaning pad 28d along the length of barrel 52 with any solvent residue being immediately drawn from barrel 52 by wiper ring 48 of cleaning pad 28b. The barrel cleaning process is repeated as cleaning pads 28c, 28b and 28a follow closely behind cleaning pad 28d down barrel 52 each being pulled by the momentum of plug 22 conveyed through tethers 24. Thus, in a process akin to obtaining a smooth shave with a multi-blade razor, each cleaning pad 28a-28d scrubs barrel 52 more than the one that preceded it down barrel 52 resulting in maximum cleaning.

Oiling pad 26 serves as a caboose to the train formed by plug 22 and cleaning pads 28a-28d. Being pulled by tethers 24 down barrel 52, applicator ring 50 deposits a thin film of oil along the length of barrel 52 with oil residue being drawn from barrel 52 by wiper ring 48. Projectile 20 having passed through barrel 52 and dissipating all of its energy can be picked up and discarded properly. Casing 12, now absent projectile 20, can be removed from firearm 54 and similarly discarded.

While shell 10 has been described with a high degree of particularity, it will be appreciated by those skilled in the art that modifications may be made thereto. For example, the number of oiling and cleaning pads 26 and 28a-28d might be increased or decreased as a manufacturer sees fit to tweak the oiling and cleaning properties of shell 10. Therefore, it is to be understood that the present invention is not limited to the single shell embodiment described above, but encompasses any and all embodiments within the scope of the following claims.

I claim:

1. A firearm barrel cleaning shell, comprising:
   a casing having opposed ends and carrying a primer at one of said ends and having an opening at the other of said ends;
   a blast conduit being positioned within said casing so as to receive the discharge from said primer and to direct the discharge toward said opening;
   a projectile being positioned within said casing, said projectile including:
       an ejectable plug closing said opening;
       an oil-saturated pad positioned adjacent said primer;
       a solvent-saturated pad positioned between said plug and said oil-saturated pad; and,
       a flexible tether connecting said plug, said oil-saturated pad and said solvent-saturated pad.
2. The firearm barrel cleaning shell according to claim 1 wherein said oiling pad includes:
a first wiper ring being formed of a substantially impermeable material and being dimensioned to snugly, yet slidably, engage said casing and said blast conduit; and,
a first applicator ring being formed of an oil-saturated fibrous material and being bonded to said first wiper ring, said first applicator ring being dimensioned to snugly, yet slidably, engage said casing and said blast conduit.

3. The firearm barrel cleaning shell according to claim 2 wherein said cleaning pad includes:
a second wiper ring being formed of a substantially impermeable material and being dimensioned to snugly, yet slidably, engage said casing and said blast conduit; and,
a second applicator ring being formed of a solvent-saturated fibrous material and being bonded to said second wiper ring, said second applicator ring being dimensioned to snugly, yet slidably, engage said casing and said blast conduit.

4. The firearm barrel cleaning shell according to claim 1 wherein said tether comprises a length of string.

5. The firearm barrel cleaning shell according to claim 1 wherein said tether has a tether segment connecting said plug to said cleaning pad having a length that is about eight times that of said casing.

6. A firearm barrel cleaning shell, comprising:
a casing adapted for positioning within the firing chamber of a firearm, said casing having opposed ends and carrying a primer adapted to explosively discharge gases upon being struck by the firing pin of a firearm at one of said ends and having an opening at the other of said ends;
a blast conduit being positioned within said casing so as to define an annulus between said blast conduit and said casing, said blast conduit having an inner end positioned about said primer so as to receive the discharge from said primer and also having an outer end positioned adjacent said opening;
a projectile being positioned within said casing, said projectile including, said projectile including:
an ejectable plug closing said opening;
an oiling pad positioned within said annulus and adjacent said primer;
a cleaning pad positioned within said annulus and between said plug and said oiling pad; and,
a flexible tether positioned within said annulus and connecting said plug, said oiling pad and said cleaning pad.

7. The firearm barrel cleaning shell according to claim 6 wherein said oiling pad includes:

a first wiper ring being formed of a substantially impermeable material and being dimensioned to snugly, yet slidably, engage said casing and said blast conduit; and,
a first applicator ring being formed of an oil-saturated fibrous material and being bonded to said first wiper ring, said first applicator ring being dimensioned to snugly, yet slidably, engage said casing and said blast conduit.

8. The firearm barrel cleaning shell according to claim 7 wherein said cleaning pad includes a second wiper ring being formed of a substantially impermeable material and being dimensioned to snugly, yet slidably, engage said casing and said blast conduit; and,
a second applicator ring being formed of a solvent-saturated fibrous material and being bonded to said second wiper ring, said second applicator ring being dimensioned to snugly, yet slidably, engage said casing and said blast conduit.

9. The firearm barrel cleaning shell according to claim 6 wherein said tether comprises a length of string.

10. The firearm barrel cleaning shell according to claim 6 wherein said tether has a tether segment connecting said plug to said cleaning pad having a length that is about eight times that of said casing.

11. A firearm barrel cleaning shell, comprising:
a casing adapted for positioning within the firing chamber of a firearm, said casing having opposed ends and carrying at one of said ends a primer adapted to explosively discharge gases upon being struck by the firing pin of a firearm and having an opening at the other of said ends;
a blast conduit being centrally positioned within said casing so as to define an annulus between said blast conduit and said casing, said blast conduit having an inner end positioned about said primer so as to receive the discharge from said primer and also having an outer end in fluid communication with said inner end for directing the discharge from said primer toward said opening;
a projectile being positioned within said casing, said projectile including, said projectile including:
an ejectable plug closing said opening;
an oiling pad positioned within said annulus and adjacent said primer;
a plurality of cleaning pads positioned within said annulus and between said plug and said oiling pad; and,
a pair of flexible tethers positioned within said annulus and connecting said plug, said oiling pad and said cleaning pads together in a train.

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