

Title

A Cleaning Method And Apparatus For Removing Oil, Grease, Rust, Carbon, Ammunition Residue From Barrels Of Artillery Gun, Battle Tank And Firearm.

Description

Background

The present invention relates to method and apparatus of cleaning gun barrels of firearm, artillery and battle tank

In these days of downsizing of manpower and declining population, Armed Forces throughout the world are looking for a more efficient way to clean said barrels.

Cleaning the gun barrels of firearm, artillery and battle tank is a tedious process that requires many man-hours. The gun barrels of artillery, battle tank and firearms are cleaned by means of a set 5 piece metal cleaning rods, each measuring more than 2 meters attached together with a wire or hard-brush. The internal surface of the barrel is cleaned by said brush by means of mechanical contact of the brush in forwards and backwards movement. Usually 4 to 6 men are deployed to carry out such task and often experiencing injury due to over-strained muscles. Also the long length of the attached cleaning rods require considerable additional space at both ends making it extremely difficult for cleaning the gun barrel of battle tank.

The current cleaning methods for cleaning the gun barrel involve using laborious and time-consuming method of scrubbing the barrel with hard brush that is abrasive. Naturally it also causes wear of the gun barrel surface, thus shortening the service life of the firearm.

The intention of the present invention is to create a new kind of method of cleaning and apparatus for cleaning the gun barrels of artillery gun battle tank and firearm without experiencing the drawbacks referred to above.

A special object of the invention is to develop an effective cleaning method and apparatus by using a light weight winch that reduces the need of manpower by at least 66% and with the help of the winch no over strained muscles will be experienced by the soldiers thereby reducing the injury of the soldiers. In addition, greater work safety will also be achieved.

A further object of the invention is reducing the time or man-hours required to clean the said barrels, thereby enhancing operational readiness and better deployment of soldiers to combatant role.



In the cleaning method according to the invention shown in figure 1, the winch comes with a pulling cable with its length ranges from 0.5 meter up to 30 meters. It has a battery terminal assembly on the side of the winch with a positive and negative battery cable ranging from 0.5 to 25 meters attached to cable clips. The retractor cable with its length ranges from 0.5 meters up to 30 meters is attached with a safety latch hook. Bore brush is suitable for cleaning barrels ranging from 75 mm up to 240 mm diameter.

In the cleaning method according to the invention shown in figure 2, the winch apparatus is mounted on the universal adapter assembly with pulling cable extended and attached with safety latch hook. Both gun barrel adapters for gun barrel with and without muzzle brake are also displayed in figure 2.

In the cleaning method according to the invention shown in figure 3 the pulling cable of the winch is attached to the one of eye-hooks of bore brush via a safety latch hook, and the other eye-hook of the bore brush is attached to the retractor cable via a safety latch hook.

In the cleaning method according to the invention shown in figure 4 a gun barrel without the muzzle brake (not part of the invention) mounted with cleaning winch via the gun barrel adapter. The gun barrel adapter is mounted on the universal adapter assembly of the winch.

In the cleaning method according to the invention shown in figure 5 a gun barrel with muzzle brake (not part of the invention) mounted with the cleaning winch via the gun barrel adapter. The gun barrel adapter is mounted on the universal adapter assembly of the winch.

The cleaning method according to the invention in figure 6 shows the steps for set-up of the apparatus for the cleaning process. The winch is mounted to the gun barrel via a gun barrel adapter (*applicable to gun barrel with or without muzzle*) which is mounted on the universal adapter assembly of the winch. The battery terminal cables are connected to the winch battery cable assembly and the terminals of the 12 volt battery. The remote switch is then connected to the winch. The winch is then unlocked to release the pulling cable, after which the retractor is pushed to the front of the barrel via the breech block. The pulling cable is then connected to the retractor cable via safety latch hooks and is pulled to the end of the barrel. They are then released for connection to the bore brush.

In the cleaning method according to the invention shown in figure 7, cleaning solution is applied on the bore brush via a hand-sprayer. The cleaning solution helps to loosen the carbon, rust, combustion ammunition residue and removes grease and oil from the barrel. The bore brush is sprayed soaking wet before being pulled through the barrel.

The cleaning method according to the invention in figure 9 shows the process of cleaning the gun barrel. The winch is switched on and bore brush is guided into the gun barrel via the breech block for pull-through of the barrel. As the winch coils up the pulling cable, the bore brush is slowly pulled to the front of the barrel. The bore brush is then removed from the pulling cable and retractor cable. The bore brush is carried to the breech block by hand for second pull-through. Meanwhile, the pulling cable is attached to the retractor cable via the safety latch hook and is pulled manually to the breech block for attachment of bore brush for second pull-through of the barrel.

In comparing barrels cleaned by the method of invention against the traditional long-handled metal brush, 75% more gun barrels were cleaned per day with two men as compared to the said traditional method with 6 men.

No over-strained muscle injuries were experienced by the soldiers using the method of invention as compared to using the traditional long-handled metal brush, where 4 men experienced said injury.

The barrels were inspected with aid of an endoscope and it was established that the barrels cleaned by the method of invention were in considerably better condition, i.e. they showed less wear and were in a pristine cleaned condition without any traces of carbon or combustion residues.

Claims

What is claimed:

1. A method and apparatus for cleaning artillery and battle tank barrels which involves the use of a winch, cleaning solution and bore brush.
2. The method of claim 1 wherein the winch system consists of pulling cable, retractor cable, remote switch assembly, battery cable and connection assembly, crank handle, safety latch hooks, and universal adapter assembly.
- 2a. The method of claim 2 wherein the winch will be mounted on a universal adapter assembly to accommodate different gun barrel adapter suitable for use on gun barrel with diameter ranging from 75 mm up to 240mm.
3. The method of claim 1 whereby bore brush of different sizes are used to clean gun barrel with diameter ranging from 75 mm to 240 mm.
4. The method of claim 1 wherein a cleaning solution can be either water or solvent based.
5. The method of claim 2 wherein the winch power source input voltage is either 12 volts or 24 volts.
6. The method of claim 2 wherein the length of the pulling cable of the winch ranges from 0.5 meter to 35 meters.
7. The method of claim 2 wherein the length of retractor cable ranges from 0.5 to 30 meters.
8. The method of claim 7 wherein the retractor cable is attached with a safety latch hook.
9. The method in claim 2 wherein the length of battery cable assembly ranges from 0.5 meter to 30 meters.
10. The method in claim 2a wherein the universal adapter assembly is designed to accommodate the gun barrel adapter with diameter of 75 mm up to 240 mm gun barrel.
11. The method in claim 2 wherein the pulling cable is attached to a safety latch hook.
12. The method in claim 3 wherein one of the eye-hooks of bore brush is connected to the pulling cable of the winch via a safety latch hook with another eye-hook is connected to the retractor cable during the cleaning process of the barrel.

13. The method in claim 12 wherein the bore brush is soaked with cleaning solution and is used to clean the barrel via the breech block.

14. The method in claim 12 wherein during the cleaning process bore brush travels from the rear of the barrel via the breech block to the front or muzzle brake of the gun barrel pulled by the winch.

15. The method in claim 14 wherein the brush is removed from the pulling cable by releasing the safety latch of the safety latch hook and the pulling cable is then connected to the retractor cable to be retrieved back to the rear of the barrel via manual pulling.

16. The method in claim 15 wherein the pulling cable is removed from the retractor cable and once again one of the eye-hooks of bore brush is connected to the pulling cable and with the retractor cable attached to the other end of the eye-hook of the bore brush and the activities of claims 14 and 15 are repeated as required.