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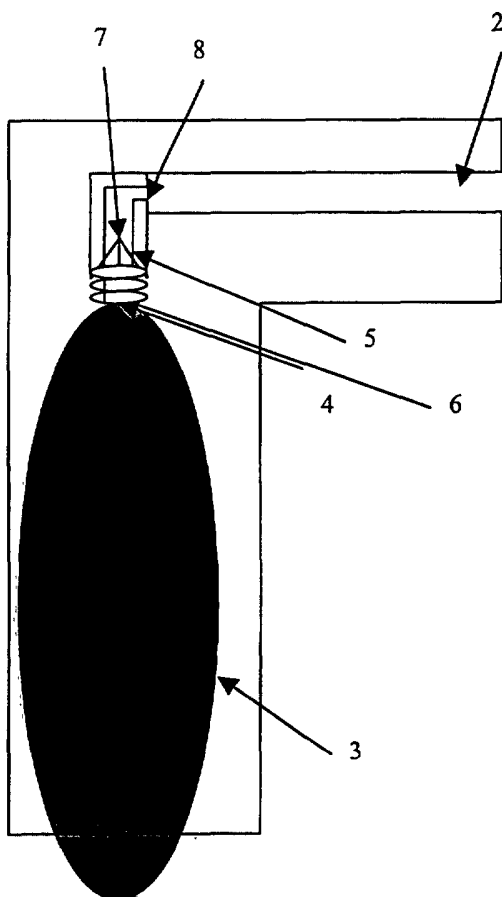
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(54) Title: A GUN CLEANING APPARATUS



(57) Abstract: Apparatus for cleaning barrels comprises a handle wherein is located a compressed gas cartridge (3). The gas cartridge is connected to a nozzle assembly via a valve arrangement (4, 5, 6). A resilient polyurethane cleaning wad is placed within the nozzle. The nozzle is engaged with the gun barrel to be cleaned. The valve arrangement (4, 5, 6) is actuated to release an impulse of compressed gas by depressing the base of the gas cartridge (3). The gas impulse propels the polyurethane cleaning wad through the nozzle assembly and into the gun barrel to be cleaned. The cleaning wad may be dipped in oil prior to use, for oiling of the gun barrel.



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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A GUN CLEANING APPARATUS

The present invention relates to an apparatus for cleaning barrels of guns and other weapons.

It is known that small and large bore rifle and hand gun barrels and components require to be cleaned regularly to prevent carbon deposit fouling and maintain accuracy and reliability.

Such cleaning operations generally require the small and large bore handgun or rifle to be dismantled and for the barrels to be removed.

For many years small and large bore rifle and hand-gun barrels have required to be cleaned by drawing a cloth type cleaning wad through the barrel after use and prior to storage to prevent barrel fouling that reduces the accuracy of the weapon.

Further, it is beneficial to oil small and large bore rifle and handgun barrels and components prior to storage to prevent rusting and moisture damage to the weapons. This is typically done by drawing a cloth type cleaning wad impregnated with gun oil prior to storage, thereby preventing rusting and moisture damage that renders the small and large bore handgun or rifle inoperable.

These cleaning and oiling methods are cumbersome and inconvenient to use.

It is an object of embodiments of the present invention to obviate or alleviate these and other disadvantages of known cleaning techniques.

According to an aspect of the present invention, there is provided an apparatus for cleaning gun barrels, comprising a nozzle for engaging with a barrel to be cleaned,

and means for propelling a cleaning member through the nozzle, by generating a compressed gas impulse within the nozzle.

According to a further aspect of the present invention, there is provided a method for cleaning a gun barrel, the method comprising the steps of:

- engaging a nozzle with a barrel to be cleaned; and
- generating a compressed gas impulse within the nozzle, to propel a cleaning member through the nozzle and into the barrel.

The apparatus is preferably made from injection moulded plastic, but may be made from another suitable lightweight plastic material or lightweight metal such as aluminium.

The invention may be better understood with reference to the illustrations of embodiments of the invention that include:

Figure A1 is an elevation view of a body assembly to suit a gun cleaning apparatus with the rotating nozzle assembly removed

Figure A2 is a perspective view of a body assembly with attached rotating flexible nozzle assembly to suit a gun cleaning apparatus in accordance with the present invention.

Figure A3 is a perspective view of a rotating flexible nozzle assembly to suit a gun cleaning apparatus in accordance with the present invention

Figure B1A is a perspective view of a cleaning wad, figure B1B is a perspective view of an oiling wad, figure B1C is a perspective view of a combined cleaning and oiling wad to suit a gun cleaning apparatus in accordance with the present invention.

The disclosed gun cleaning apparatus is a plastic or lightweight metal handset having an internal gas cartridge or reservoir 3 with a barrel 2 and flexible rotating nozzle assembly 9. The cleaning wad 1A or oiling wad 1B is propelled from the flexible rotating nozzle assembly 9 by means of a compressed gas blast provided from a gas cartridge or a hand pump.

The compressed gas is stored in a gas cylinder or reservoir 3 that feeds in to a valve assembly 5 by means of a connector pipe 4.

The valve assembly 5 by has a non return valve 4 at its base to ensure that no compressed gas can be returned to the gas cylinder or reservoir 3.

The valve assembly 5 is housed in a spring mount 6.

By depressing the end of the gas cylinder or reservoir 3 a measured amount of compressed gas passes through the non-return valve 4 and through the valve assembly 5 pressurising the barrel by means of the barrel gas nozzle 8. Alternatively, a trigger arrangement or other actuating switch or button may be provided.

Prior to depressing the gas cylinder or reservoir 3 a cleaning wad 1A or oiling wad 1B is placed into the breech 11 of the flexible rotating nozzle assembly 9.

Access to the barrel 2 and the breech 11 is achieved by rotating the rotating flexible nozzle assembly 9 on a hinge 10.

Gas seal and pressure retention between the barrel 2 and the rotating flexible nozzle assembly 9 is achieved by a seal 12 tapered to fit the barrel 2.

The gas passing through the barrel gas nozzle 8 causes the cleaning wad 1A or oiling wad 1B to be expelled from the breech 11 of the rotating flexible nozzle assembly 9.

The cleaning wad 1A or oiling wad 1B is then forced down the rotating flexible nozzle assembly 9 into the barrel of the small and large bore rifle or handgun being cleaned and exits from the end of the muzzle of the small and large bore handgun or rifle at low velocity.

The rotating flexible nozzle assembly 9 is designed in such a manner as to allow the rotating flexible nozzle assembly 9 to extend into the breech of a range of handguns and rifles between 0.22 calibre and 0.50 calibre by means of a graduated or tapered tip close in diameter to the chamber of the gun.

As the cleaning wad 1A passes through the barrel of the small and large bore rifle or hand gun being cleaned it removes carbon and other deposits from the interior surface of the barrel thereby cleaning the barrel and removing carbon and other contaminants.

Alternatively, where the apparatus is used with an oiling wad 1B, as the oiling wad 1B passes through the barrel of the small and large bore rifle or hand gun being cleaned it oils the interior surface of the barrel thereby oiling and protecting the interior surface of the barrel.

Alternatively, where the apparatus is used with a combined cleaning and oiling wad 1C, as the combined cleaning and oiling wad 1C passes through the barrel of the small and large bore rifle or hand gun being cleaned it cleans and oils the interior surface of the barrel thereby removing debris and oiling and protecting the interior surface of the barrel.

Alternatively, where the cleaning wad 1A, oiling wad 1B or combined wad 1C is used without the apparatus, the wad may be forced through the barrel with a rod to effect cleaning or oiling.

The cleaning wad 1A may be constructed of a polyurethane/virgin foam manufactured from closed cell coarse porosity with specific density and tear strength. The cleaning wad is preferably resilient, and is intended to be of slightly larger diameter than the gun barrel being cleaned. The resilience enables the plug to expand against the inside surface of the barrel of the small and large bore rifle or handgun and create surface pressure sufficient to wipe any contamination, whilst also depositing remaining residue into the porous structure of the cleaning wad 1A and staying intact. The end surfaces of the cleaning wad 1A may be sealed with a non-permeable membrane to prevent gas passing through the cleaning wad 1A.

The oiling wad 1B is of similar construction, and is additionally oil dipped so as to wipe the inner surface of the previously cleaned barrel by the cleaning wad 1A. The oiling wad 1B is of sufficient resilience to create surface pressure sufficient to ensure oiling of the barrel of the small and large bore rifle or handgun. Any suitable weapon maintenance oil or alternative lubricant may be used. The end surfaces of the oiling wad 1B may be sealed with a non-permeable membrane to prevent gas passing through the wad.

The diameter of the cleaning wad 1A or oiling wad 1B is preferably approximately 15% larger than the internal diameter of the bore to be cleaned. The length of the wad is preferably at least 30% longer than the diameter of the wad.

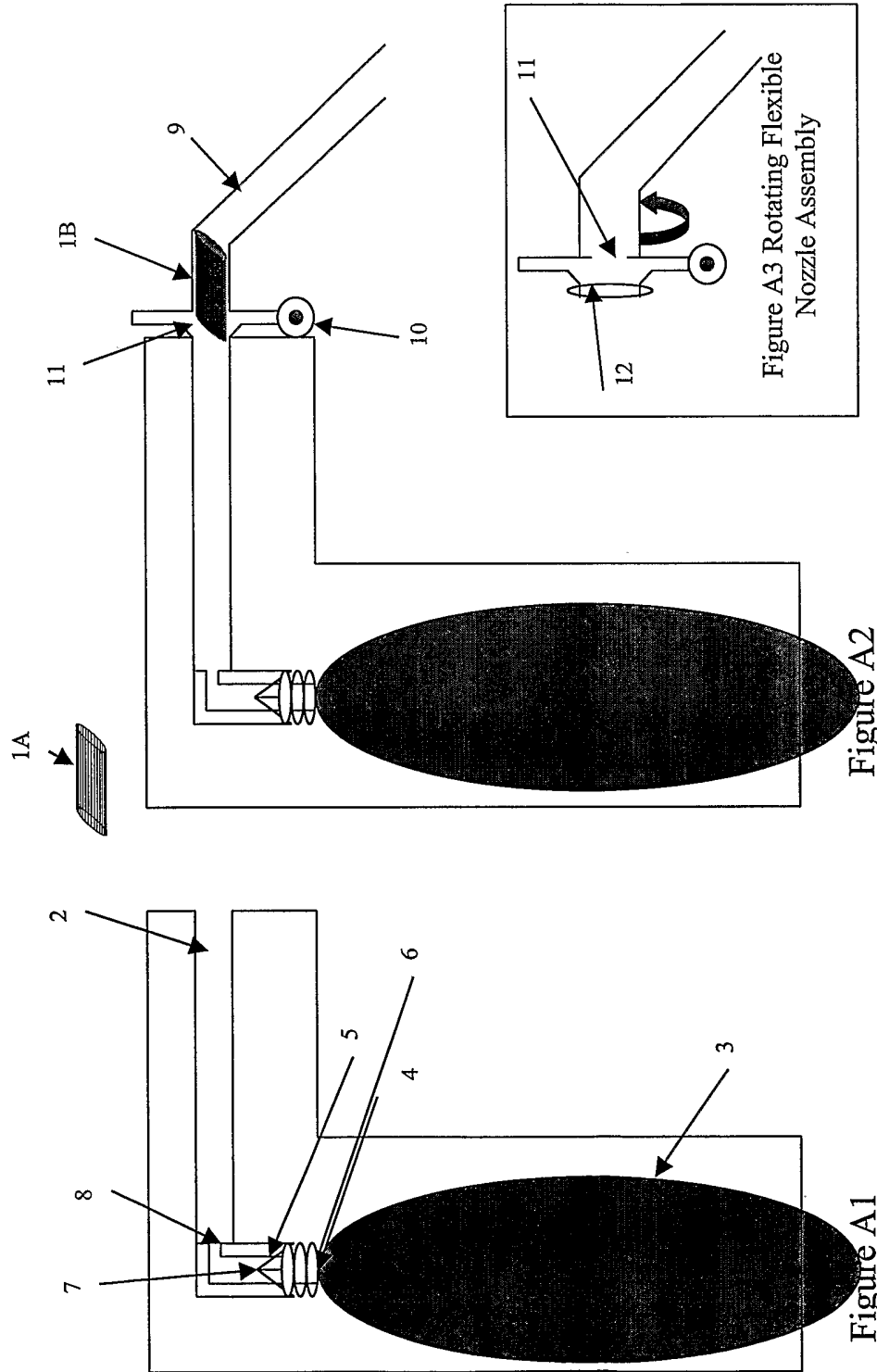
The combined cleaning and oiling wad 1C is of identical construction to the previous cleaning 1A and oiling 1B wads, but combined into a single wad.

It will be understood that the foregoing is for illustrative purposes only, and that numerous variations and modifications may be made to the apparatus described herein without departing from the scope of the invention.

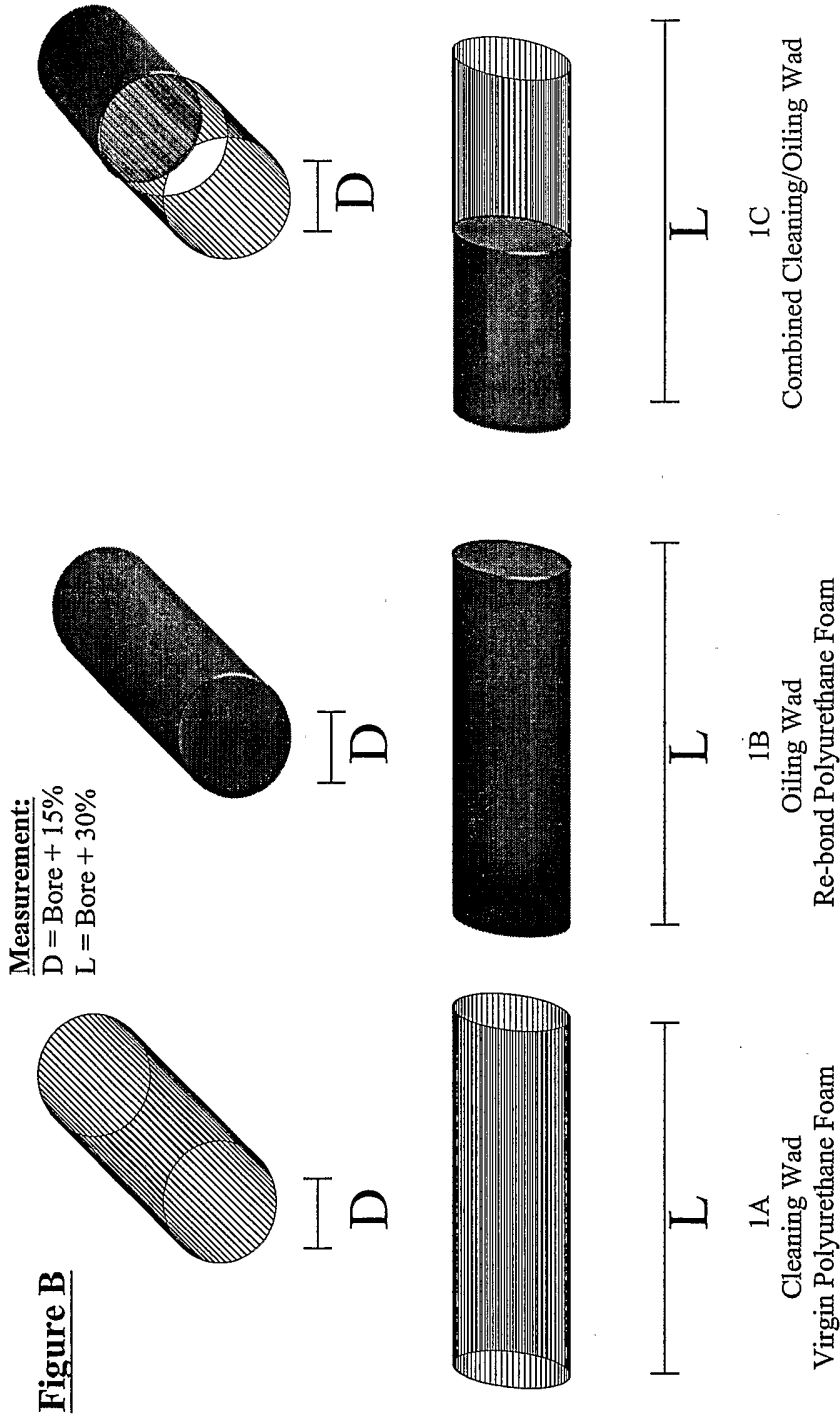
CLAIMS

1. Apparatus for cleaning gun barrels, comprising a nozzle for engaging with a barrel to be cleaned, and means for propelling a cleaning member through the nozzle, by generating a compressed gas impulse within the nozzle.
2. The apparatus of claim 1, wherein the propulsion means comprises a store of compressed gas in combination with means for releasing gas from the store.
3. The apparatus of claim 2, wherein the store of compressed gas comprises a gas cartridge.
4. The apparatus of claim 3, wherein the gas cartridge is replaceable.
5. The apparatus of claim 3 or 4, wherein the gas cartridge is rechargeable.
6. The apparatus of claim 1, wherein the propulsion means comprises an air pump.
7. The apparatus of claim 6, wherein the air pump is manually-operated.
8. The apparatus of claim 6 or 7, wherein the propulsion means comprises a gas reservoir which is pressurised by the air pump.
9. The apparatus of claim 8, wherein the apparatus comprises means for releasing gas from the reservoir.
10. The apparatus of claims 2 to 5 or claim 9, wherein the means for releasing gas comprises a valve.
11. The apparatus of any preceding claim, further comprising means for actuating the propelling means.
12. The apparatus of claim 11, wherein the actuating means comprises a trigger, button, or the like.
13. The apparatus of any preceding claim, in combination with a cleaning member.
14. The apparatus of claim 13, wherein the cleaning member comprises a polymeric material.

15. The apparatus of claim 14, wherein the cleaning member comprises polyurethane.
16. The apparatus of claims 13 to 15, wherein the cleaning member is generally cylindrical.
17. The apparatus of claims 13 to 16, wherein the cleaning member is impregnated with a cleaning substance.
18. The apparatus of claims 13 to 16, wherein the cleaning member is impregnated with an oiling substance.
19. The apparatus of any of claims 13 to 18, wherein the cleaning member is resilient.
20. The apparatus of any preceding claim, wherein the nozzle is dimensioned to be insertable into an end of a barrel to be cleaned.
21. The apparatus of any preceding claim, wherein the nozzle comprises a graduated tip of varying diameter.
22. The apparatus of any preceding claim, wherein the nozzle is flexible.
23. The apparatus of any preceding claim, wherein the nozzle is rotatable.
24. The apparatus of any preceding claim, wherein the nozzle is removable.
25. The apparatus of any preceding claim, further comprising a handle portion, dimensioned to fit into a user's hand.
26. The apparatus of claim 25, wherein the propelling means is located within the handle portion.
27. The apparatus of claims 25 or 26, further comprising means for actuating the propelling means located on the handle portion.
28. A method for cleaning a gun barrel, the method comprising the steps of:
 - engaging a nozzle with a barrel to be cleaned; and
 - generating a compressed gas impulse within the nozzle, to propel a cleaning member through the nozzle and into the barrel.
29. Apparatus for cleaning a gun barrel substantially as hereinbefore described and as illustrated in the accompanying Figures.



A Gun Cleaning Apparatus



A Gun Cleaning Apparatus - Cleaning Wad, Oiling Wad and Combined Wad

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU03/00214

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According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: IPC F42B 5/24; F41A 29/00, 29/02, 29/04		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DWPI: IPC (F41A 029/IC OR F42B 005/24)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	US 6389978 B (HOOPER et al) 21 May 2002 Whole document, in particular, claims 1 & 10 and figures 1, 5 & 10	1-29
X	US 5421263 A (RUOHONEN) 6 June 1995 Whole document, in particular, claim 1-9 and figures 1-6	1-29
X	US 4998368 A (BLASE) 12 March 1991 Whole document, in particular, claim 1 and figure 7	1-29
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input type="checkbox"/> See patent family annex		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 21 May 2003		Date of mailing of the international search report 29 MAY 2003
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer LIONEL BOPAGE Telephone No : (02) 6283 2153

INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4843750 A (BLASE) 4 July 1989 Whole document, in particular, claim 6	1-29
X	FR 2599827 A (DEJOUX et al) 11 December 1987 Whole document, in particular, claims and figures 1 & 5	1-29
X	US 3740883 A (KYLE) 26 June 1973 Whole document	1-29
X	US 3476047 A (DAVIS) 4 November 1969 Whole document	1-29
X	US 3209690 A (MERCATORIS, JR) 5 October 1965 Whole document, in particular, claims and figure 2	1-29
X	US 938836 A (FESSENDEN) 2 November 1909 Whole document, in particular, page 1 lines 66 to 110	1-29

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU03/00214

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report	Patent Family Member
US 6389978	NONE
US 5421263	NONE
US 4998368	NONE
US 4843750	NONE
FR 2599827	NONE
US 3740883	NONE
END OF ANNEX	