



DEPARTMENT OF THE NAVY

OFFICE OF COUNSEL
NAVAL UNDERSEA WARFARE CENTER DIVISION
1176 HOWELL STREET
NEWPORT RI 02841-1708

IN REPLY REFER TO:

Attorney Docket No. 83150

Date: 2 October 2003

The below identified patent application is available for licensing. Requests for information should be addressed to:

PATENT COUNSEL
NAVAL UNDERSEA WARFARE CENTER
1176 HOWELL ST.
CODE 00OC, BLDG. 112T
NEWPORT, RI 02841

Serial Number 10/456,163
Filing Date 6/6/03
Inventor Carlos E. Galliano

If you have any questions please contact James M. Kasischke, Acting Deputy Counsel, at 401-832-4736.

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

ASSEMBLY FOR LAUNCHING BODIES FROM AN UNDERWATER PLATFORM

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT CARLOS E. GALLIANO, citizen of the United States of America, employee of the United States Government, and resident of North Kingstown, County of Washington, State of Rhode Island, has invented certain new and useful improvements entitled as set forth above, of which the following is a specification.

JAMES M. KASISCHKE, ESQ.
Reg. No. 36562
Naval Undersea Warfare Center
Division, Newport
Newport, RI 02841-1708
TEL: 401-832-4736
FAX: 401-832-1231



23523

PATENT TRADEMARK OFFICE

20031017 142

1 Attorney Docket No. 83150

2
3 ASSEMBLY FOR LAUNCHING BODIES FROM AN UNDERWATER PLATFORM
4

5 STATEMENT OF GOVERNMENT INTEREST

6 The invention described herein may be manufactured and used
7 by or for the Government of the United States of America for
8 Governmental purposes without the payment of any royalties
9 thereon or therefor.
10

11 BACKGROUND OF THE INVENTION

12 (1) Field of the Invention

13 The invention relates to naval submarine design and
14 construction, and is directed more particularly to a novel
15 assembly for underwater launching of bodies, such as torpedoes,
16 mines, missiles, unmanned underwater vehicles, and the like.

17 (2) Description of the Prior Art

18 The horizontal launch of torpedoes and other weapons and
19 devices from submarines has traditionally been conducted with
20 torpedo tubes, typically arranged in groups of two. An impulse
21 tank ports water from an ejection pump to each of the two tubes.
22 Two impulse tank and tube group assemblies are located at the bow
23 of the boat, one assembly on the starboard side and one assembly
24 on the port side.

1 The aft ends of the tubes are located in a torpedo room and
2 penetrate the forward pressure hull to provide a path to the
3 outboard sea environment. The torpedo room is among the most
4 complex and expensive aspects of submarine design and
5 construction, due in large part to the inherent risk of large
6 pressure hull penetrators, i.e., torpedo tubes of at least
7 twenty-one inches in diameter.

8 There is a need for a new submarine launch system which does
9 not require large or multiple pressure hull penetrations, in
10 which the bodies to be launched may be stored outside of the
11 pressure hull, and which is, in general, of less cost, weight and
12 complexity than existing systems.

14 SUMMARY OF THE INVENTION

15 An object of the invention is, therefore, to provide a
16 launch assembly for submarines, which assembly is devoid of large
17 and multiple pressure hull penetrations, provides for storage
18 outside the pressure hull of bodies to be launched, and which is
19 less expensive than present systems, lighter in weight, and of
20 less complexity.

21 With the above and other objects in view, as will
22 hereinafter appear, a feature of the present invention is the
23 provision of an assembly for launching bodies from an underwater
24 platform having a pressure hull, and an outer hull subject to
25 free flooding. The assembly includes a module having a proximal

1 end for disposition outboard of the pressure hull portion of the
2 platform, and a distal end for disposition proximate and in
3 alignment with a launch opening in the outer hull portion. A
4 chamber in the module extends from the distal end of the module
5 to proximate the proximal end of the module, the module chamber
6 being adapted to receive and retain one of the bodies. A support
7 structure on the platform retains the module. A pump on the
8 platform is in communication with water outside the pressure
9 hull. An impulse tank on the platform is in communication with
10 the pump. The module is provided with a manifold adapted to be
11 placed in communication with the impulse tank for directing
12 outflow of water from the impulse tank to the chamber to eject
13 the body from the chamber.

14 The above and other features of the invention, including
15 various novel details of construction and combinations of parts,
16 will now be more particularly described with reference to the
17 accompanying drawings and pointed out in the claims. It will be
18 understood that the particular assembly embodying the invention
19 is shown by way of illustration only and not as a limitation of
20 the invention. The principles and features of this invention may
21 be employed in various and numerous embodiments without departing
22 from the scope of the invention.

1 BRIEF DESCRIPTION OF THE DRAWINGS

2 Reference is made to the accompanying drawings in which is
3 shown an illustrative embodiment of the invention, from which its
4 novel features and advantages will be apparent, wherein
5 corresponding reference characters indicate corresponding parts
6 in the two views of the drawings and wherein:

7 FIG. 1 is a diagrammatic, generally sectional view of one
8 form of assembly illustrative of an embodiment of the invention;
9 and

10 FIG. 2 is a perspective view of a payload module portion of
11 the assembly of FIG. 1.

12
13 DESCRIPTION OF THE PREFERRED EMBODIMENTS

14 Referring to FIG. 1, it will be seen that the launch
15 assembly 10 is disposed between a pressure hull 12 and an outer
16 hull 14 of a submarine 16. This area is free-flooded when the
17 submarine is submerged.

18 A bow portion 18 of the outer hull 14 is provided with an
19 opening 20. A support structure, such as a sleeve 22, is
20 disposed at a forward end 24 thereof in the opening 20 and
21 extends aft therefrom. The sleeve 22 is adapted to receive a
22 payload module 26 having therein a selected number of chambers
23 28, each chamber being adapted to receive and retain a body 29 to
24 be launched.

1 In FIG. 2, there is shown a payload module 26 having a
2 selected number of chambers 28 therein for torpedoes. Other
3 payload modules (not shown) are configured with appropriate
4 chambers to retain, for example, selected numbers of mines, or
5 missiles, or at least one unmanned underwater vehicle.

6 The support structure 22 preferably includes not only the
7 sleeve shown in the drawings, but additional support structure as
8 needed to retain the sleeve in position.

9 Preferably, a forward end 30 of the payload module 26 is
10 conformed to the configuration of the outer hull 14.

11 At an aft end 32 of the support structure sleeve 22, there
12 is disposed an impulse tank 34 which is in communication by way
13 of a conduit 36, with a pump 38. The pump 38 receives sea water
14 through conduit 40, pressurizes the sea water and forces the
15 pressurized sea water through the conduit 36 to the impulse tank
16 34.

17 The pump 38 is in driving communication with an electric
18 motor 42, as by a drive shaft 44. The electric motor 42 is in
19 electrical communication with an interior portion 46 within the
20 pressure hull 12, as by a cable 48 extending through a pressure
21 hull penetration 50.

22 Each module 26 is provided at its aft end 52 with a manifold
23 54 having an inlet 56 in communication with the impulse tank 34
24 and an outlet 58 which is movable by rotational movement of the
25 manifold 54 to align with a selected one of the chambers 28.

1 A manifold controller 60 serves to detect the current
2 position of the manifold 54 and move the manifold in accordance
3 with instructions received from the submarine interior portion 46
4 by way of a cable 62 which extends through a pressure hull
5 penetration 64.

6 In operation, instructions as to which chamber 28 is to be
7 fired are sent from the interior portion 46 of the submarine 16
8 through the cable 62 to the controller 60 which detects where the
9 manifold outlet 58 is disposed and, if warranted, moves the
10 manifold 54 rotatably until the outlet 58 is in alignment with
11 the appropriate chamber 28. By signal through the cable 48, the
12 electric motor 42 drives the pump 38 which pressurizes water
13 received from the conduit 40 and forces the water into the
14 impulse tank 34 and thence through the manifold 54 and into the
15 appropriate chamber 28 to launch body 29, such as a torpedo.

16 There is thus provided a novel launch system for submarines
17 which includes only two very small pressure hull penetrations, in
18 which the launch bodies are stored outside the pressure hull, to
19 render space available within the pressure hull, and which is of
20 less cost, weight and complexity than traditional torpedo rooms
21 and attendant systems.

22 It will be understood that many additional changes in the
23 details, materials, and arrangement of parts, which have been
24 herein described and illustrated in order to explain the nature
25 of the invention, may be made by those skilled in the art within

- 1 the principles and scope of the invention as expressed in the
- 2 appended claims.

1 Attorney Docket No. 83150

2

3 ASSEMBLY FOR LAUNCHING BODIES FROM AN UNDERWATER PLATFORM

4

5 ABSTRACT OF THE DISCLOSURE

6 An assembly for launching bodies from an underwater platform
7 having a pressure hull, and an outer hull subject to free
8 flooding. The assembly includes a module having a proximal end
9 outboard of the pressure hull portion of the platform, a distal
10 end disposed proximate and in alignment with a launch opening in
11 the outer hull portion, and a chamber in the module extending
12 from the distal end of the module to proximate the proximal end
13 of the module, the module chamber being adapted to receive and
14 retain one of the bodies. Support structure on the platform
15 retains the module. A pump on the platform is in communication
16 with water outside the pressure hull, and an impulse tank on the
17 platform is in communication with the pump. A manifold is in
18 communication with the impulse tank for directing outflow of
19 water from the impulse tank to the chamber to eject the body from
20 the chamber.

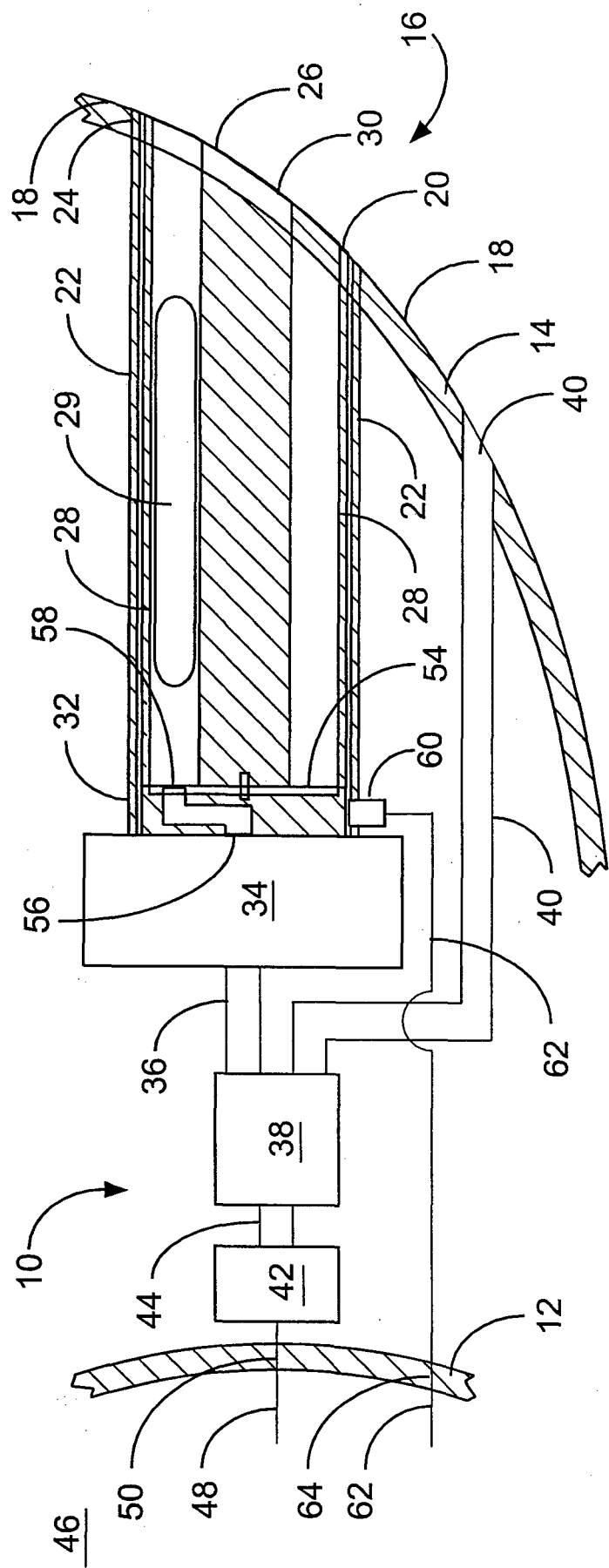


FIG. 1

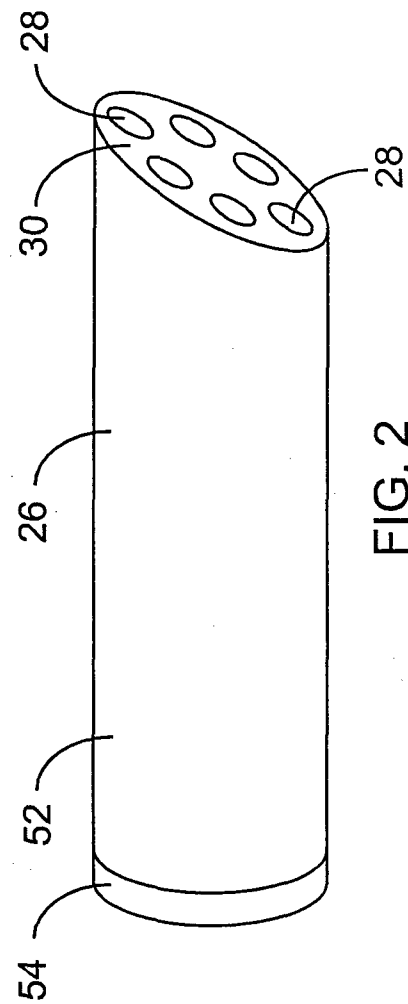


FIG. 2