Claims

1.- A torpedo (1) comprising a cylindrical tubular casing (2) housing at the rear an electric propulsion motor (3) that drives a propulsive propeller (4); the casing houses an explosive warhead (6), a power source (7) that powers the electric propulsion motor (3) and an electronic control unit (8);

the explosive warhead (6) comprises three explosive components:

a detonator (10) that receives an activation command from the control unit (8);

an explosive booster (11) that is detonated by the detonator (10); and

a main explosive (12) that detonates following the explosion of the booster (11);

the three explosive components (10, 11, and 12) are arranged in an **arming** position in which the three explosive components (10, 11, and 12) are physically aligned along one direction, and an explosion of the detonator (10) sequentially triggers the explosion of the booster (11) and the main explosive (12);

the power source (7) is configured to activate immediately following the exit of the torpedo (1) from the launch tube of an underwater means to provide the necessary voltage to power the electric motor (3),

characterized in that it comprises means configured to compare the intensity of the current $\mathbf{I_{mot}}$ absorbed by the electric motor (3) following the activation of the power source (7) with a first lower current threshold $\mathbf{I_{mot\text{-}low}}$ and a second higher current threshold $\mathbf{I_{mot\text{-}high}}$ in order to safely perform the following control operations of the warhead (6):

a) if the intensity $\mathbf{I_{mot}}$ of the measured current is below the first lower current threshold $\mathbf{I_{mot\text{-}low}}$, the generation and/or transmission of the activation command to the detonator (10) is prevented;

b) if the intensity $\mathbf{I_{mot}}$ of the measured current is above the second higher current threshold $I_{mot\text{-}high}$ the generation and/or transmission of the activation command to the detonator (10) is prevented;

c) if the intensity $\mathbf{I_{mot}}$ of the measured current is between the first lower current threshold $\mathbf{I_{mot\text{-}low}}$ and the second higher current threshold $\mathbf{I_{mot\text{-}high}}$ the generation and/or transmission of the activation command to the detonator (10) is allowed.

2.- The torpedo as claimed in claim 1 wherein, the three explosive components (10, 11, and 12) are physically available within the torpedo from a **safety position** in which any accidental explosion of the detonator (10) does not propagate and cannot operate the explosion of the main explosive (12) to said **arming** position in which the three explosive components (10, 11, and 12) are physically aligned

along one direction and an explosion of the detonator (10) sequentially triggers the explosion of the booster (11) and the main explosive (12);

a) if the intensity $\mathbf{I_{mot}}$ of the measured current is below the first lower current threshold $\mathbf{I_{mot\text{-}low}}$ the generation and/or transmission of the activation command to the detonator (10) or the arrangement of the three components in the arming position is prevented;

b) if the intensity $\mathbf{I_{mot}}$ of the measured current is above the second higher current threshold $I_{mot\text{-}high}$ the generation and/or transmission of the activation command to the detonator (10) or the arrangement of the three components in the arming position is prevented;

c) if the intensity $\mathbf{I_{mot}}$ of the measured current is between the first lower current threshold $\mathbf{I_{mot\text{-}low}}$ and the second higher current threshold $\mathbf{I_{mot\text{-}high}}$ the generation and/or transmission of the activation command to the detonator (10) or the arrangement of the three components in the arming position is allowed.

3. - The torpedo according to claim 1, wherein filtering means (30) are provided designed to enable transmission of the activation command from the electronic unit to the detonator (10) when the intensity $\mathbf{I_{mot}}$ of the measured current is between the first lower current threshold $\mathbf{I_{mot\text{-}low}}$ and the second higher current threshold $\mathbf{I_{mot\text{-}high}}$ for a predetermined

time interval.

4.- A method for controlling a torpedo (1) in which a cylindrical tubular casing (2) houses at the rear an electric propulsion motor (3) that drives a propulsive propeller (4); the casing houses an explosive warhead (6), a power source (7) that powers the electric propulsion motor (3) and an electronic control unit (8);

the explosive warhead (6) comprises three explosive components:

a detonator (10) that receives an activation command from the control unit (8);

an explosive booster (11) that is detonated by the detonator (10); and

a main explosive (12) that detonates following the explosion of the booster (11);

the method comprising the steps of:

- activating the power source (7) following the exit of the torpedo (1) from the launch tube of an underwater means to provide the voltage necessary to power the electric motor (3),
- comparing the intensity of the current $\mathbf{I_{mot}}$ absorbed by the electric motor (3) following the activation of the power source (7) with a first lower current threshold $\mathbf{I_{mot\text{-}low}}$ and a second higher current threshold $\mathbf{I_{mot\text{-}high}}$ in order to safely perform the following control operations of the warhead (6):

a) if the intensity $\mathbf{I_{mot}}$ of the measured current is below the first lower current threshold $\mathbf{I_{mot\text{-}low}}$ prevent the generation and/or transmission of the activation command to the detonator (10);

5b) if the intensity $\mathbf{I_{mot}}$ of the measured current is above the second higher current threshold $I_{mot\text{-}high}$ prevent the generation and/or transmission of the activation command to the detonator (10);

c) if the intensity $\mathbf{I_{mot}}$ of the measured current is between the first lower current threshold $\mathbf{I_{mot\text{-}low}}$ and the second higher current threshold $\mathbf{I_{mot\text{-}high}}$ allow the generation and/or transmission of the activation command to the detonator (10).

5. The method of claim 4 further comprising the step of arranging the three explosive components (10, 11, and 12) from a **safety position** in which any accidental explosion of the detonator (10) does not propagate and cannot operate the explosion of the main explosive (12) to said arming position in which the three components are physically aligned along one direction and an explosion of the detonator (10) sequentially triggers the explosion of the booster (11) and the main explosive (12);

d) if the intensity $\mathbf{I_{mot}}$ of the measured current is below the first lower current threshold $\mathbf{I_{mot\text{-}low}}$ prevent the generation and/or transmission of the activation command to the detonator (10) or the arrangement of the three components in

the arming position;

e) if the intensity $\mathbf{I_{mot}}$ of the measured current is above the second higher current threshold $I_{mot-high}$ prevent the generation and/or transmission of the activation command to the detonator (10) or the arrangement of the three components in the arming position;

f) if the intensity $\mathbf{I_{mot}}$ of the measured current is between the first lower current threshold $\mathbf{I_{mot-low}}$ and the second higher current threshold $\mathbf{I_{mot-high}}$ allow the generation and/or transmission of the activation command to the detonator (10) or the arrangement of the three components in the arming position.

6.- The method according to claim 4, wherein a filtering step is provided designed to allow transmission of the activation command from the electronic unit (8) to the detonator (10) when the intensity $\mathbf{I_{mot}}$ of the measured current is between the first lower current threshold $\mathbf{I_{mot-low}}$ and the second higher current threshold $\mathbf{I_{mot-high}}$ for a predetermined time interval.