UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HUNTING TITAN, INC.

Petitioner

v.

DYNAENERGETICS EUROPE GMBH

Patent Owner

Case: PGR2020-00080
Patent No. 10,472,938

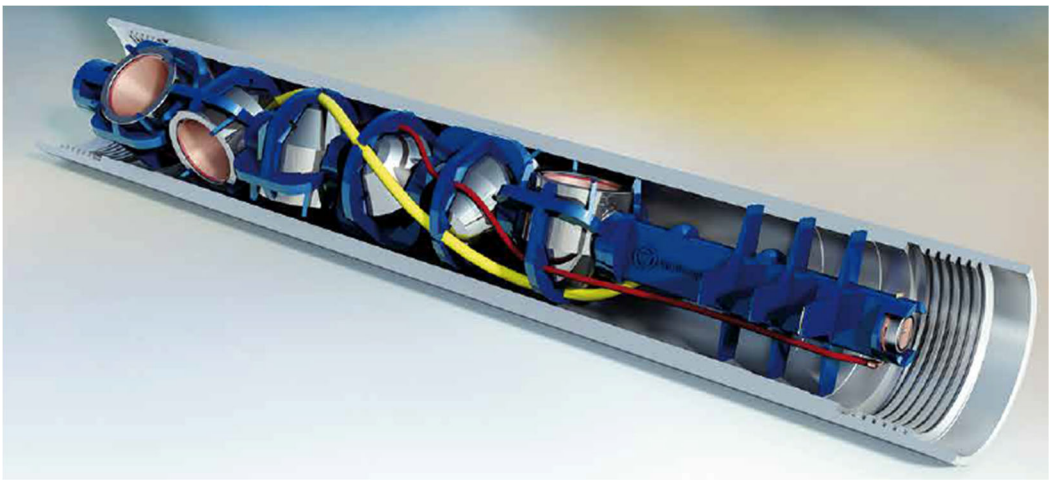
DECLARATION OF THILO SCHARF

I, Thilo Scharf, being over the age of 18 and competent to make the declarations herein, do hereby declare that:

1. I am the Product Line Director of Systems at DynaEnergetics Europe GmbH ("DynaEnergetics"), and I have held this role since 2017. I joined DynaEnergetics as a Customer Support Manager in 2011 before becoming a Product Line Manager in 2014. In my roles as Product Line Manager and now as Product Line Director, I have overseen the development of new products for DynaEnergetics, including the DynaStage® system, all the way from conception of the product to designing the product and ultimately launching the product into the marketplace. I also meet with DynaEnergetics' customers and industry groups in the United States.

2. DynaEnergetics introduced their DynaStage® perforation gun system during the Offshore Technology Conference (OTC) in May 2014.

3. The DynaStage® system (shown below, as introduced in 2014) is DynaEnergetics' fully Plug and Go™ perforating system. The DynaStage® system is designed to greatly reduce the industry's most common failure points and elevate users' safety while simplifying and streamlining operations. For example, the DynaStage® system reduces gun assembly and disassembly times, maintenance, and risk of misfire.

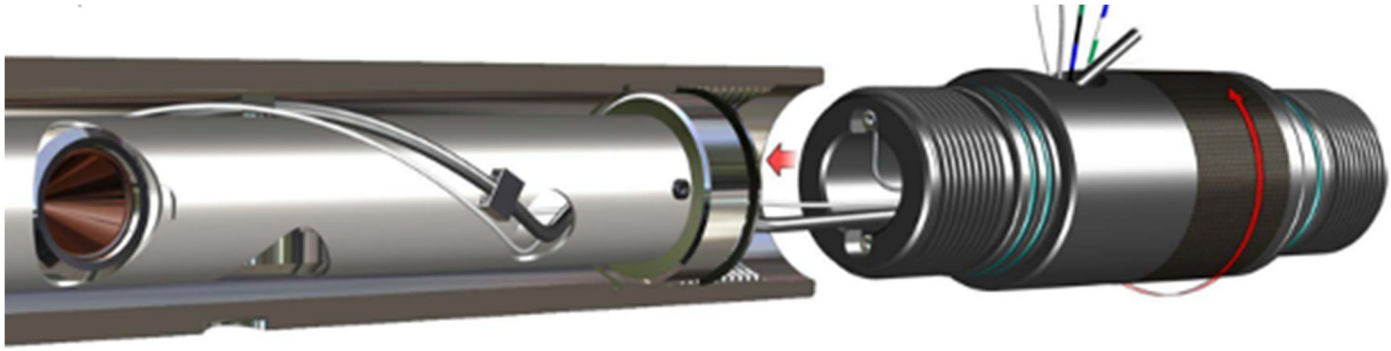


Ex. 2009 at 1.

4. The DynaStage® system was a top-down redesign of conventional perforation guns and associated wellbore perforating operations.

5. Conventional perforation guns required meticulous, manual assembly of perforation gun components and wiring of electrical and ballistic connections necessary for relaying signals to and through the gun. Assembling the components included, among other things, positioning a highly-engineered and machined metal charge tube containing explosive shaped charges within a gun carrier, and wiring the electrical and making the ballistic connections used to relay electrical detonation signals and detonate the shaped charges. Assembly and/or wiring was performed on-site, due to, for example, transportation regulations prohibiting transporting products in a manner that might result in accidental detonation of explosive components.

6. For example, the excerpts below, from Petitioner's own Gun Loading Manual (Ex. 2004) and User Manual (Ex. 2005), illustrate and describe, in Petitioner's own words, just one portion of the complicated assembly and wiring configurations and procedures that conventional perforating systems required when DynaEnergetics launched the DynaStage® system, and still require.



Ex. 2004 at 14.

Figure 40

Figure 47

Figure 48

Installing the ControlFire® switch into tandem subs: Connect the white wire from the ControlFire® switch body to the live wire coming from the gun above. Connect the ground wires from both the gun above and gun below to the black wire coming from the ControlFire® switch body. Connect the blue wire from the ControlFire® switch body to the live wire coming from the gun below. Figure 47 and

- Figure 48 show the proper wiring for the ControlFire® switch in a tandem sub. The green and red wires coming from the ControlFire® switch body should be left alone until arming the gun. (Note that the ControlFire® switch body may be black shrink wrap or maroon plastic

Ex. 2005 at 40, 43.

7. As shown in the images above, when assembling the perforation gun string, wiring had to be manually manipulated and connected to other wires via a small port in the top of the tandem sub. Such subs were reusable components since they isolated adjacent guns and were not destroyed by explosions of the guns. This port in the sub was also used to manually wire (i.e., by hand) all of the connections, including connecting a "signal" line wire to a selective perforation switch and/or to a detonator.

8. In a conventional perforation gun, it is not uncommon for ground wires to be manually wedged on or in between threaded pieces, wrapped around an end of an outer gun carrier, or wrapped around an existing screw or retainer nut. Without a reliable ground wire connection design, the electrical connection might become damaged, unstable/ intermittent or fail outright upon assembly and / or conveying/ running of the perforation gun. In addition, when a wired detonator is used it must be manually connected to the ground wire and upon connecting perforation gun components by, e.g., threaded connections that require relative rotation between the components, the ground wire may become twisted, crimped, pierced, ripped away from electrical components, etc.

9. The above "Installing the ControlFire® switch into tandem subs" portion of Petitioner's User Manual (Ex. 2005 at 43) is typical of the complex wiring instructions for conventional wired perforating gun systems, and that is just

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