PATENTS - SUMMARY

Reference the following Patents and Trademarks owned by Marine Turbine Technologies, LLC (MTT) and Turbine Powered Technology, LLC (TPT). TPT is a technology entity wholly owned by Ted McIntyre:

1	**PATENT**	**US9429078B1**	**Multi-Compatible Digital Engine Controller**	A digital engine controller compatible with multiple variants of gas turbine engine is programmed to receive identification of a variant of gas turbine engine coupled to the digital controller and thereafter to automatically determine and adjust inputs to the engine, according to the received identification of engine variant, to meet user-specified output.
2	**PATENT**	**US9879609B1**	**Multi-Compatible Digital Engine Controller**	A digital engine controller compatible with multiple variants of gas turbine engine is programmed to receive identification of a variant of gas turbine engine coupled to the digital controller and thereafter to automatically determine and adjust inputs to the engine, according to the received identification of engine variant, to meet user-specified output.
3	**PATENT**	**US9869305B1**	**Pump-Engine Controller**	A system controller manages a gas turbine engine driving a pump directly or indirectly coupled to the engine. The controller is programmed to automatically determine and adjust inputs to the gas turbine engine in order to cause the pump to produce a user-specified hydraulic output.
4	**PATENT**	**US9689316B1**	**Gas Turbine Engine Overspeed Prevention**	A controller for a gas turbine engine is configured to respond to one or more prescribed engine overspeed conditions. Rather than shutting the engine down, the controller substantially reduces N1 airflow and substantially concurrently activates one or more engine igniters.
5	**PATENT**	**US9638101B1**	**System and Method for Automatically Controlling One or Multiple Turbogenerators**	At least one controller manages a gas turbine engine driving a generator directly or indirectly coupled to the engine. The controller is programmed to automatically determine and adjust inputs to the gas turbine engine in order to cause the generator to produce a user-specified electrical output. Multiple sets of generator, engine, and controller may be used, in which case a master controller individually manages the other controllers to collectively provide the a user-specified electrical output.
6	**PATENT**	**US9829002B2**	**Pump System for High Pressure Application**	A pump system for high pressure, high volume applications is presented. The pump system includes a turbo-shaft engine having a drive shaft and a high pressure, high RPM centrifugal pump coupled to the drive shaft. In certain embodiments the pump system further includes a second low pressure, high RPM centrifugal pump coupled to the drive shaft.
7	**PATENT**	**US10415557B1**	**Controller Assembly for Simultaneously Managing Multiple Engine/Pump Assemblies to Perform Shared Work**	A pumping system includes a pump array of multiple pump-engine assemblies. Each pump-engine assembly comprises a pump and a gas turbine engine driving the pump. A manifold is coupled to the pumps. A master controller is coupled to each of the pump-engine assemblies either directly or via one or more intermediate controllers. The master controller and any intermediate controllers are collectively programmed to respond to user input including a desired hydraulic output at the manifold by automatically calculating and applying inputs to the individual pump-engine assemblies to provide the desired hydraulic output.
8	**PATENT**	**US10465689B2**	**Pump System for High Pressure Application**	A pump system for high pressure, high volume applications is presented. The pump system includes a turbo-shaft engine having a drive shaft and a high pressure, high RPM centrifugal pump coupled to the drive shaft. In certain embodiments the pump system further includes a second low pressure, high RPM centrifugal pump coupled to the drive shaft.
9	**PATENT**	**US10760556B1**	**Pump-Engine Controller**	A system controller manages a gas turbine engine driving a pump directly or indirectly coupled to the engine. The controller is programmed to automatically determine and adjust inputs to the gas turbine engine in order to cause the pump to produce a user-specified hydraulic output.
10	**PATENT**	**US10815833B1**	**Exhaust Baffle Apparatus and Method**	An exhaust baffle apparatus includes an enclosure having longitudinal, lateral, and anterior dimensions. The apparatus defines an internal volume defining an airflow path proceeding from an intake opening to an exhaust opening. There are a multiplicity of mixers within the enclosure. Each mixer includes a length spanning the lateral dimension of the enclosure. Each mixer further comprises a hollow airfoil substantially open at lateral ends of the mixer and at least one vent oriented toward the exhaust opening. A different feature involves a method of dampening noise and heat form engine exhaust.

PATENTS - SUMMARY (Continued)

Reference the following Patents and Trademarks owned by Marine Turbine Technologies, LLC (MTT) and Turbine Powered Technology, LLC (TPT). TPT is a technology entity wholly owned by Ted McIntyre:

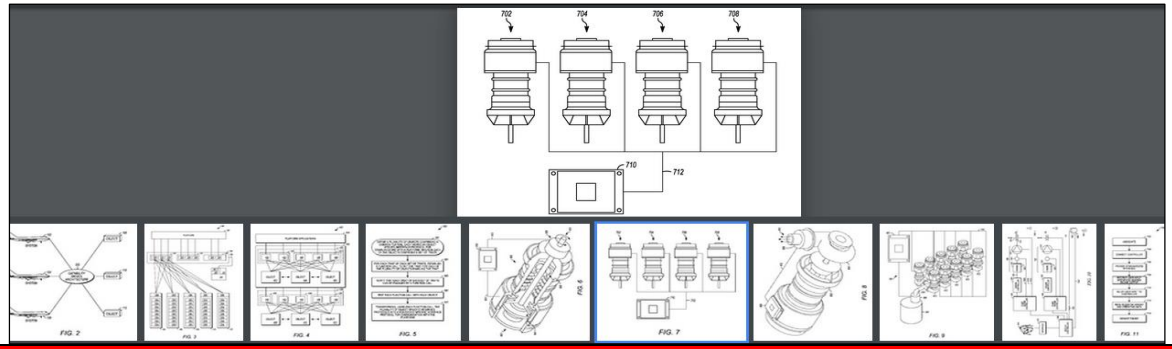
11	**PATENT**	**US10955130B1**	**Exhaust Powered Liquid Evaporator Apparatus and Method**	An apparatus for rapidly evaporating liquid includes an exhaust flow channel having opposing openings including an upstream opening and a downstream opening. The channel defines an exhaust path proceeding from the upstream opening through the exhaust flow channel and through the downstream opening. Within the exhaust flow channel, a conduit path includes repeated passes transverse to the exhaust path. Attached to the exhaust flow channel proximate the downstream opening, a spray fixture is coupled to an exit port of the conduit. The spray fixture includes a divider to divide fluid from the exit port into multiple streams and an aimer to direct the multiple streams into the exhaust path.
12	**PATENT**	**US10967947B1**	**Airboat Trim Apparatus and Method**	A trim system for an airboat having a hull and a deck comprises an engine support carriage elevated from the deck and having a first end pivotably mounted to the deck via a rigid frame, and at least one remotely operated hydraulic ram with each including a first end braced upon the deck or an intervening structure and a second end coupled to a free moving second end of the engine support carriage opposite the first end. In a method of adjusting trim on an airboat, during operation of an engine mounted to the engine support carriage, a thrust line of the engine is selectively changed by remotely causing at least one linearly actuated lift to selectively extend and retract.
13	**PATENT**	**US11060460B1**	**Fuel Distribution System for Gas Turbine Engine**	A fuel distribution system for a gas turbine powerplant. A fuel injector with a cylindrical body defines a single internal plenum sealed at an engagement end, having multiple axial openings in a midsection, and injection ports in an injection end. A fuel manifold defines a hollow annular fuel chamber with substantially parallel and opposing top and bottom surfaces. One chamber wall includes multiple cylindrical channels extending between the top and bottom surfaces. Each channel is connected through the wall to the fuel chamber. Each channel has securing features to engage corresponding securing features of the fuel injectors. When a fuel injector is inserted through the top surface into one of the channels in the manifold and the securing features engage, the engaging feature protrudes from the top surface, the injection ports protrude from the bottom surface, and the axial openings are in fluid communication with the fuel chamber.
14	**PATENT**	**USD943061S1**	**Fuel Nozzle - Gas Turbine**	Fuel Nozzle for gas turbine design patent. Continuation of application No. 16/371,753, filed on Apr. 1, 2019, now Pat. No. 11,060,460.
15	**PATENT**	**US11460016B1**	**Controller Assembly for Simultaneously Managing Multiple Engine/Pump Assemblies to Perform Shared Work**	A pumping system includes a pump array of multiple pump-engine assemblies. Each pump-engine assembly comprises a pump and a gas turbine engine driving the pump. A manifold is coupled to the pumps. A master controller is coupled to each of the pump-engine assemblies either directly or via one or more intermediate controllers. The master controller and any intermediate controllers are collectively programmed to respond to user input including a desired hydraulic output at the manifold by automatically calculating and applying inputs to the individual pump-engine assemblies to provide the desired hydraulic output.
16	**TRADEMARK**	**Registration No. 4724316**	**CRUZFRAC**	Software to control high horsepower turbine driven pumps for use in hydraulic fracturing operations; electric components to control high horsepower turbine driven pumps for use in hydraulic fracturing operations, namely, integrated circuits, processors, controllers, digital data computers, relays and sensors. Diagnostic services in the field of high horsepower turbine driven pumps.
17	**TRADEMARK**	**Registration No. 3999924**	**FRAC STACK PACK**	Hydraulic fracturing equipment consisting of pumps, gear boxes and turbine engines grouped together in a space-saving configuration.

1

PATENT [US9429078B1](#) **Multi-Compatible Digital Engine Controller**

ABSTRACT A digital engine controller compatible with multiple variants of gas turbine engine is programmed to receive identification of a variant of gas turbine engine coupled to the digital controller and thereafter to automatically determine and adjust inputs to the engine, according to the received identification of engine variant, to meet user-specified output.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.

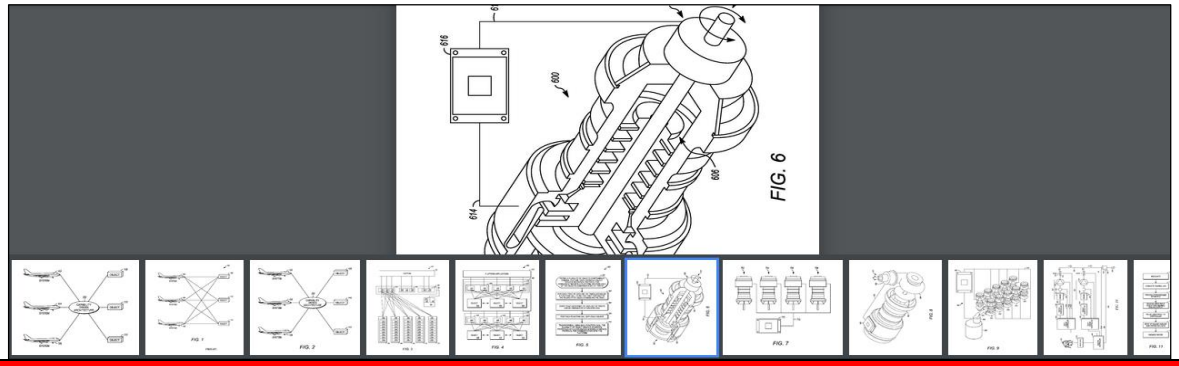


2

PATENT [US9879609B1](#) **Multi-Compatible Digital Engine Controller**

ABSTRACT A digital engine controller compatible with multiple variants of gas turbine engine is programmed to receive identification of a variant of gas turbine engine coupled to the digital controller and thereafter to automatically determine and adjust inputs to the engine, according to the received identification of engine variant, to meet user-specified output.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.

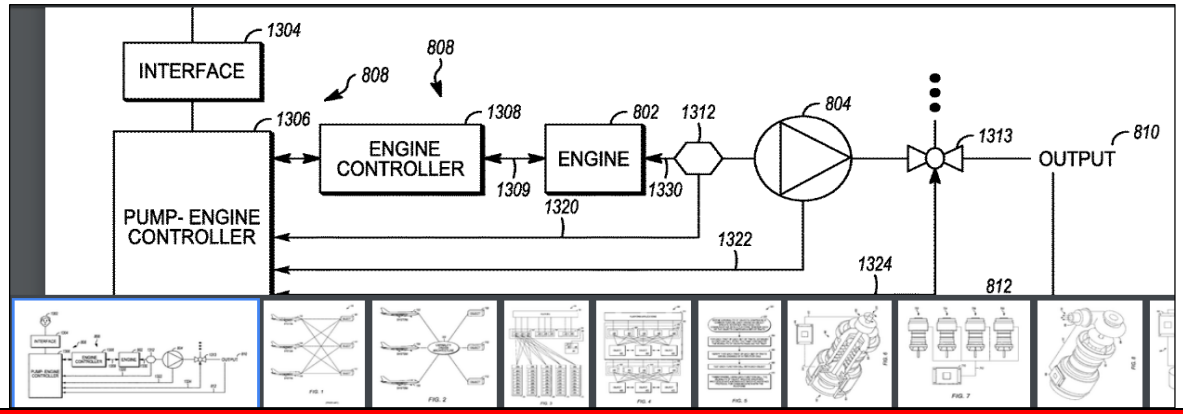


3

PATENT [US9869305B1](#) **Pump-Engine Controller**

ABSTRACT A system controller manages a gas turbine engine driving a pump directly or indirectly coupled to the engine. The controller is programmed to automatically determine and adjust inputs to the gas turbine engine in order to cause the pump to produce a user-specified hydraulic output.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.

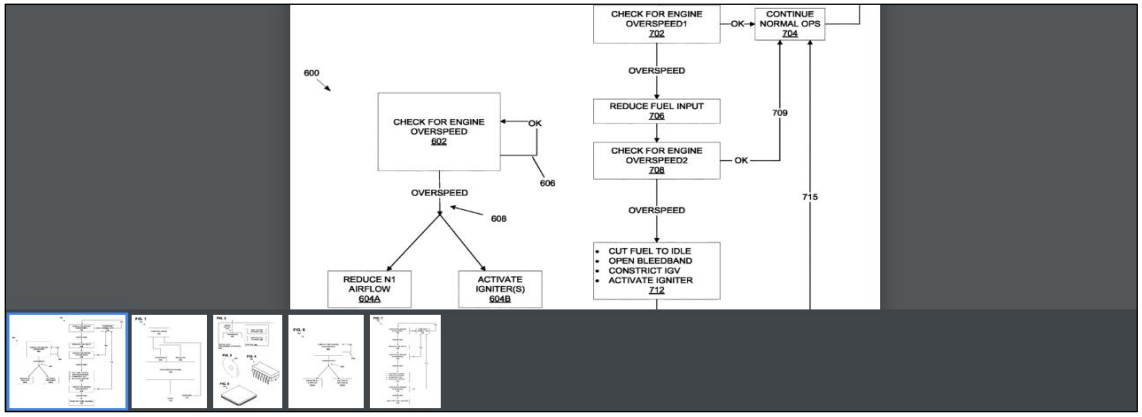


4

PATENT [US9689316B1](#) **Gas Turbine Engine Overspeed Prevention**

ABSTRACT A controller for a gas turbine engine is configured to respond to one or more prescribed engine overspeed conditions. Rather than shutting the engine down, the controller substantially reduces N1 airflow and substantially concurrently activates one or more engine igniters.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.

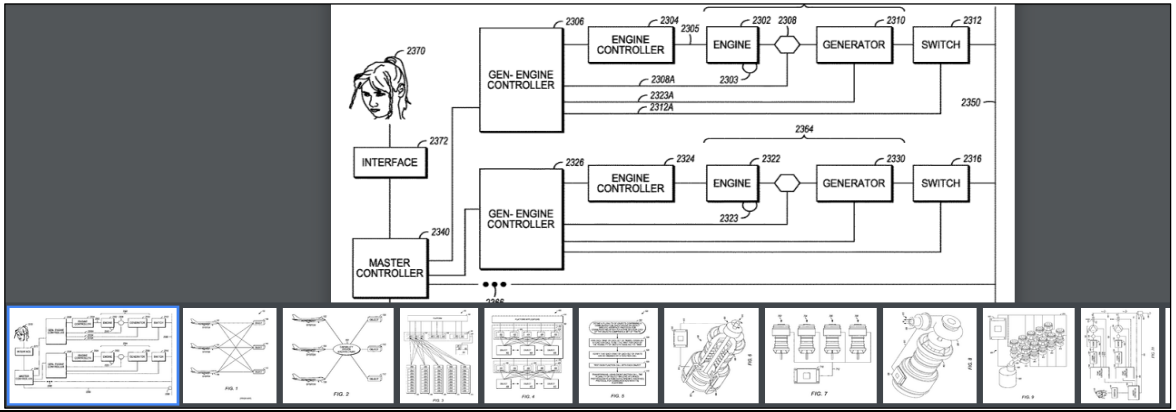


5

PATENT [US9638101B1](#) **System and Method for Automatically Controlling One or Multiple Turbogenerators**

ABSTRACT At least one controller manages a gas turbine engine driving a generator directly or indirectly coupled to the engine. The controller is programmed to automatically determine and adjust inputs to the gas turbine engine in order to cause the generator to produce a user-specified electrical output. Multiple sets of generator, engine, and controller may be used, in which case a master controller individually manages the other controllers to collectively provide the a user-specified electrical output.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.

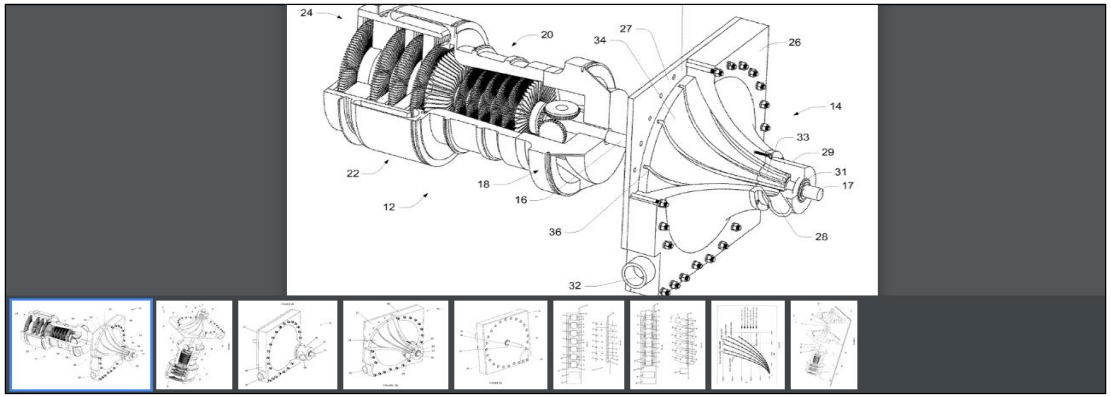


6

PATENT [US9829002B2](#) **Pump System for High Pressure Application**

ABSTRACT A pump system for high pressure, high volume applications is presented. The pump system includes a turbo-shaft engine having a drive shaft and a high pressure, high RPM centrifugal pump coupled to the drive shaft. In certain embodiments the pump system further includes a second low pressure, high RPM centrifugal pump coupled to the drive shaft.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.



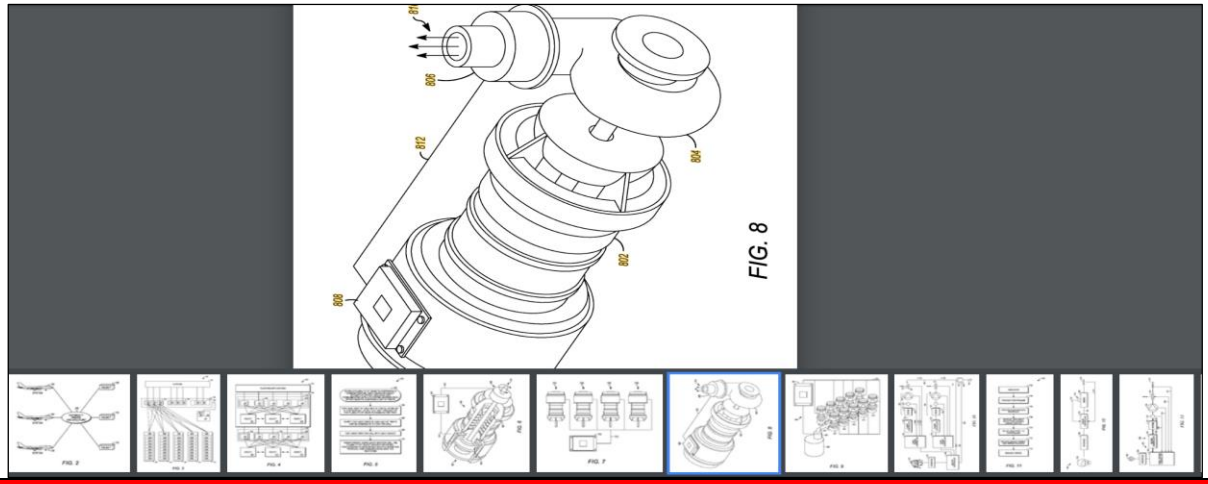
7

PATENT [US10415557B1](#) **Controller Assembly for Simultaneously Managing Multiple Engine/Pump Assemblies to Perform Shared Work**

ABSTRACT

A pumping system includes a pump array of multiple pump-engine assemblies. Each pump-engine assembly comprises a pump and a gas turbine engine driving the pump. A manifold is coupled to the pumps. A master controller is coupled to each of the pump-engine assemblies either directly or via one or more intermediate controllers. The master controller and any intermediate controllers are collectively programmed to respond to user input including a desired hydraulic output at the manifold by automatically calculating and applying inputs to the individual pump-engine assemblies to provide the desired hydraulic output.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.



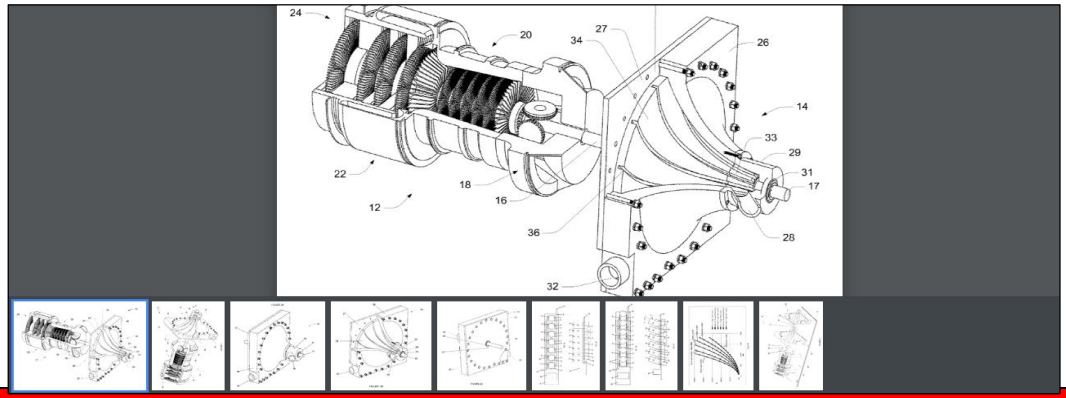
8

PATENT [US10465689B2](#) **Pump System for High Pressure Application**

ABSTRACT

A pump system for high pressure, high volume applications is presented. The pump system includes a turbo-shaft engine having a drive shaft and a high pressure, high RPM centrifugal pump coupled to the drive shaft. In certain embodiments the pump system further includes a second low pressure, high RPM centrifugal pump coupled to the drive shaft.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.

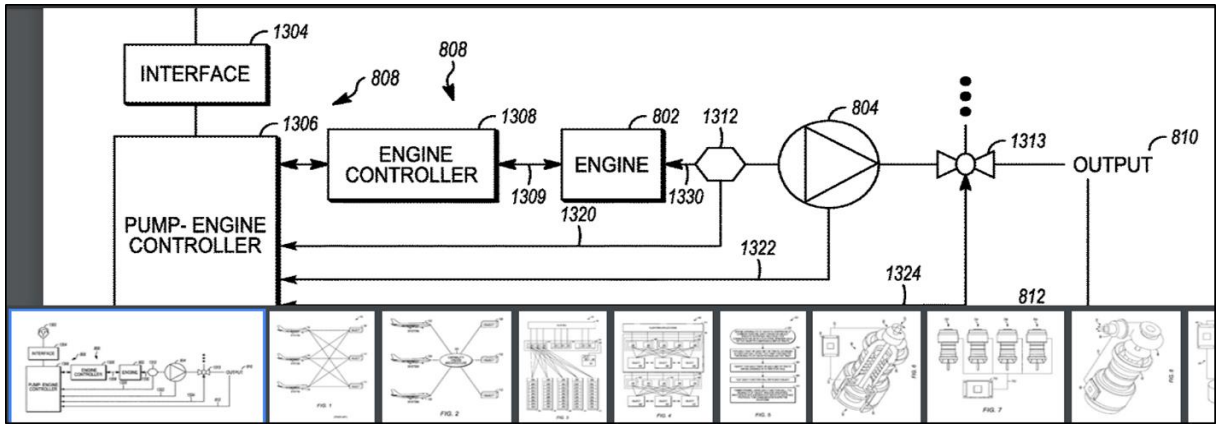


9

PATENT [US10760556B1](#) **Pump-Engine Controller**

ABSTRACT A system controller manages a gas turbine engine driving a pump directly or indirectly coupled to the engine. The controller is programmed to automatically determine and adjust inputs to the gas turbine engine in order to cause the pump to produce a user-specified hydraulic output.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.

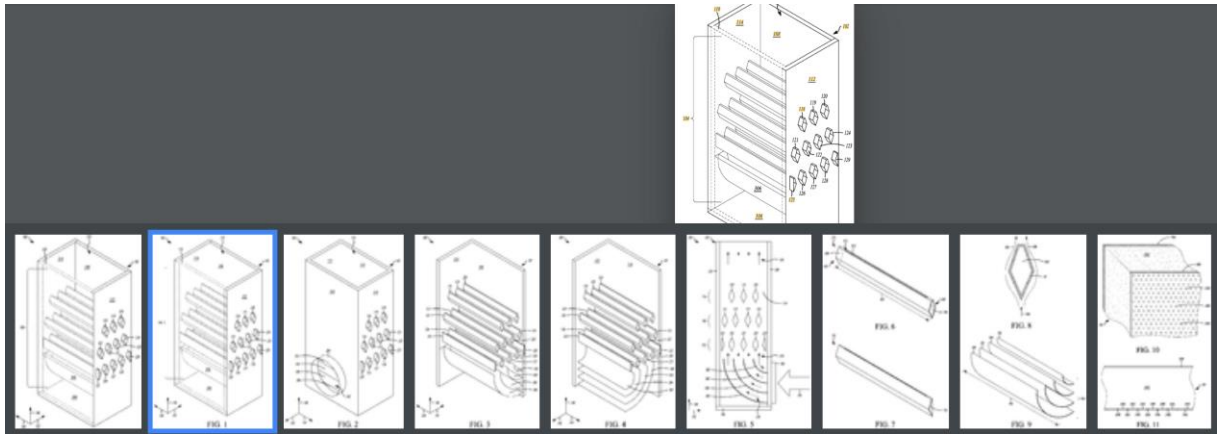


10

PATENT [US10815833B1](#) **Exhaust Baffle Apparatus and Method**

ABSTRACT An exhaust baffle apparatus includes an enclosure having longitudinal, lateral, and anterior dimensions. The apparatus defines an internal volume defining an airflow path proceeding from an intake opening to an exhaust opening. There are a multiplicity of mixers within the enclosure. Each mixer includes a length spanning the lateral dimension of the enclosure. Each mixer further comprises a hollow airfoil substantially open at lateral ends of the mixer and at least one vent oriented toward the exhaust opening. A different feature involves a method of dampening noise and heat form engine exhaust.

ASSIGNEE Marine Turbine Technologies, LLC (MTT)



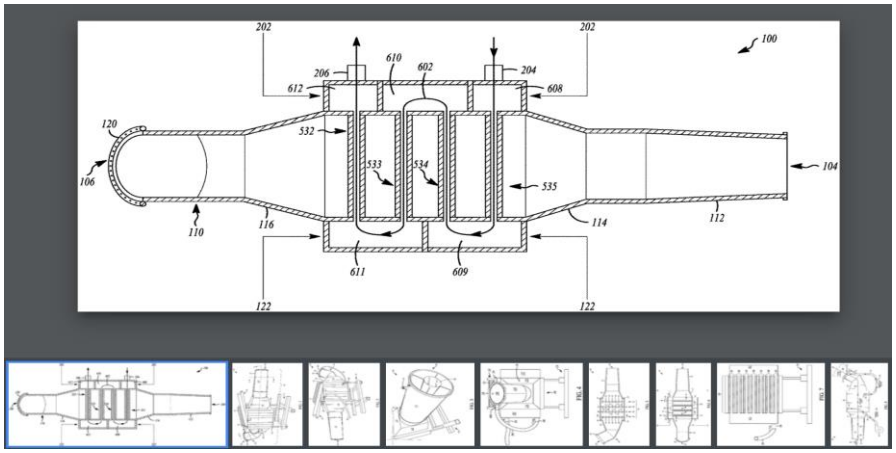
11

PATENT [US10955130B1](#) **Exhaust Powered Liquid Evaporator Apparatus and Method**

ABSTRACT

An apparatus for rapidly evaporating liquid includes an exhaust flow channel having opposing openings including an upstream opening and a downstream opening. The channel defines an exhaust path proceeding from the upstream opening through the exhaust flow channel and through the downstream opening. Within the exhaust flow channel, a conduit path includes repeated passes transverse to the exhaust path. Attached to the exhaust flow channel proximate the downstream opening, a spray fixture is coupled to an exit port of the conduit. The spray fixture includes a divider to divide fluid from the exit port into multiple streams and an aimer to direct the multiple streams into the exhaust path.

ASSIGNEE Marine Turbine Technologies, LLC (MTT)



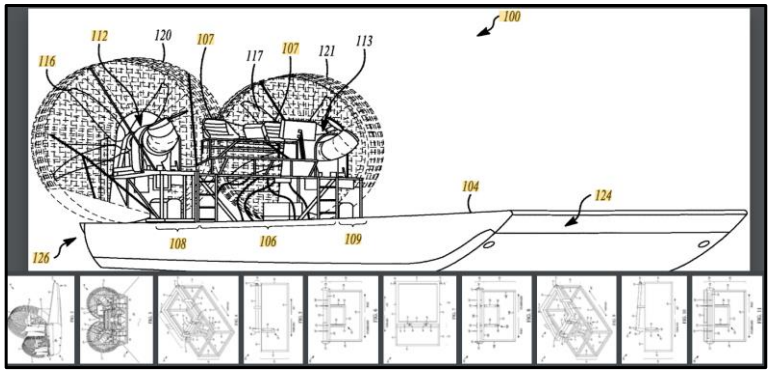
12

PATENT [US10967947B1](#) **Airboat Trim Apparatus and Method**

ABSTRACT

A trim system for an airboat having a hull and a deck comprises an engine support carriage elevated from the deck and having a first end pivotably mounted to the deck via a rigid frame, and at least one remotely operated hydraulic ram with each including a first end braced upon the deck or an intervening structure and a second end coupled to a free moving second end of the engine support carriage opposite the first end. In a method of adjusting trim on an airboat, during operation of an engine mounted to the engine support carriage, a thrust line of the engine is selectively changed by remotely causing at least one linearly actuated lift to selectively extend and retract.

ASSIGNEE Marine Turbine Technologies, LLC (MTT)



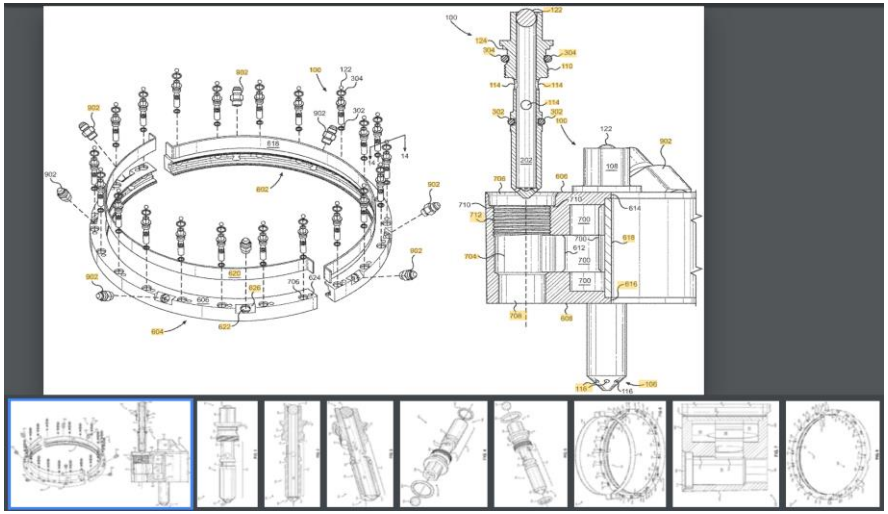
13

PATENT [US11060460B1](#) **Fuel Distribution System for Gas Turbine Engine**

ABSTRACT

A fuel distribution system for a gas turbine powerplant. A fuel injector with a cylindrical body defines a single internal plenum sealed at an engagement end, having multiple axial openings in a midsection, and injection ports in an injection end. A fuel manifold defines a hollow annular fuel chamber with substantially parallel and opposing top and bottom surfaces. One chamber wall includes multiple cylindrical channels extending between the top and bottom surfaces. Each channel is connected through the wall to the fuel chamber. Each channel has securing features to engage corresponding securing features of the fuel injectors. When a fuel injector is inserted through the top surface into one of the channels in the manifold and the securing features engage, the engaging feature protrudes from the top surface, the injection ports protrude from the bottom surface, and the axial openings are in fluid communication with the fuel chamber.

ASSIGNEE Marine Turbine Technologies, LLC (MTT)

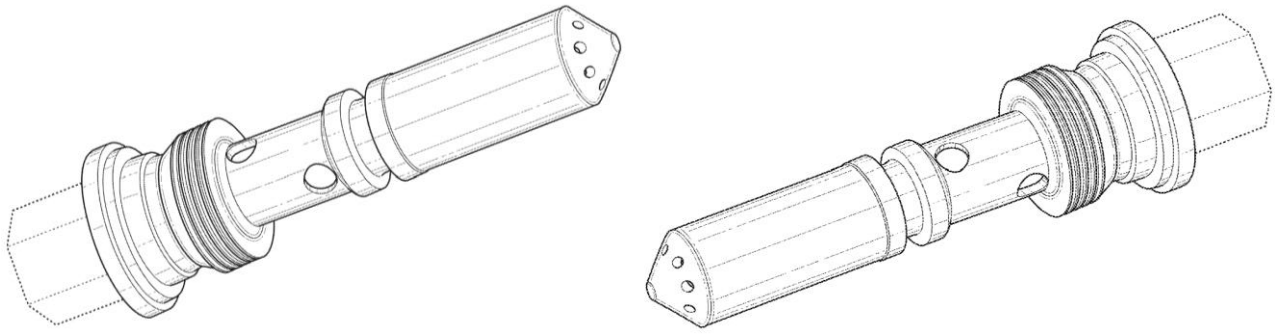


14

PATENT [USD943061S1](#) **Fuel Nozzle - Gas Turbine**

ABSTRACT Fuel Nozzle for gas turbine design patent. Continuation of application No. 16/371,753, filed on Apr. 1, 2019, now Pat. No. 11,060,460.

ASSIGNEE Marine Turbine Technologies, LLC (MTT)



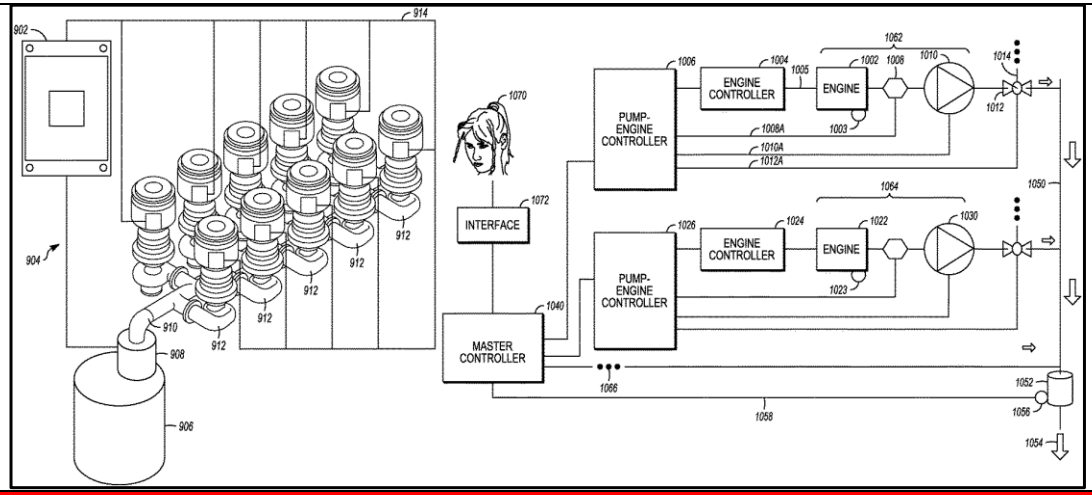
15

PATENT [US11460016B1](#) **Controller Assembly for Simultaneously Managing Multiple Engine/Pump Assemblies to Perform Shared Work**

ABSTRACT

A pumping system includes a pump array of multiple pump-engine assemblies. Each pump-engine assembly comprises a pump and a gas turbine engine driving the pump. A manifold is coupled to the pumps. A master controller is coupled to each of the pump-engine assemblies either directly or via one or more intermediate controllers. The master controller and any intermediate controllers are collectively programmed to respond to user input including a desired hydraulic output at the manifold by automatically calculating and applying inputs to the individual pump-engine assemblies to provide the desired hydraulic output.

ASSIGNEE Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.



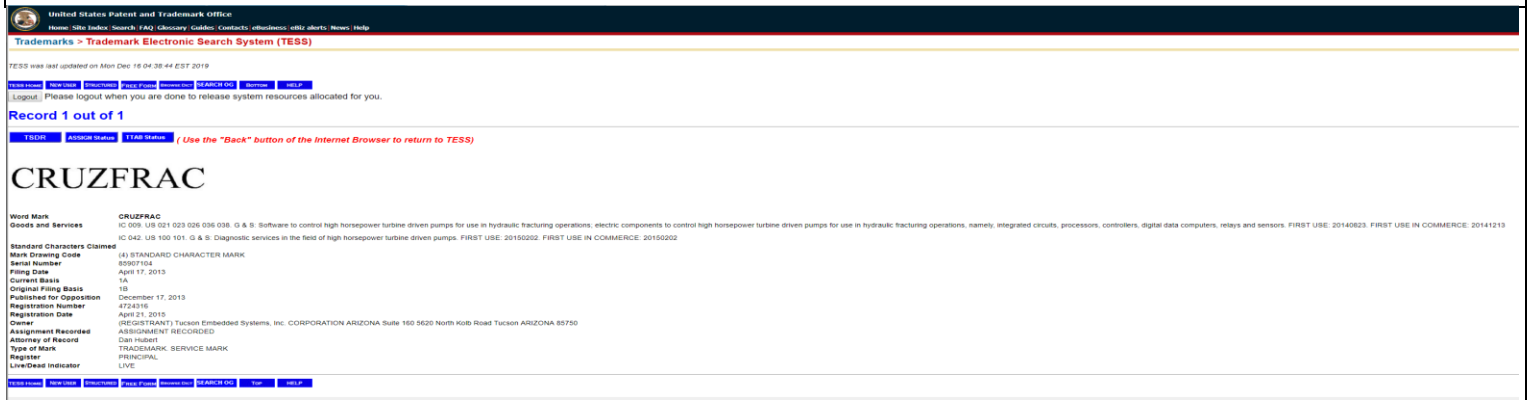
16

TRADEMARK **Registration No. 4724316**

CRUZFRAC

GOODS AND SERVICES Software to control high horsepower turbine driven pumps for use in hydraulic fracturing operations; electric components to control high horsepower turbine driven pumps for use in hydraulic fracturing operations, namely, integrated circuits, processors, controllers, digital data computers, relays and sensors. Diagnostic services in the field of high horsepower turbine driven pumps.

ASSIGNEE **Turbine Powered Technology, LLC and Tucson Embedded Systems, INC.**



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Word Mark	CRUZFRAC
Goods and Services	IC 009. US 021 023 026 036 038. G & S: Software to control high horsepower turbine driven pumps for use in hydraulic fracturing operations; electric components to control high horsepower turbine driven pumps for use in hydraulic fracturing operations, namely, integrated circuits, processors, controllers, digital data computers, relays and sensors. FIRST USE: 20140823. FIRST USE IN COMMERCE: 20141213
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Serial Number	85907104
Filing Date	April 17, 2013
Current Basis	1A
Original Filing Basis	1B
Published for Opposition	December 17, 2013
Registration Number	4724316
Registration Date	April 21, 2015
Owner	(REGISTRANT) Tucson Embedded Systems, Inc. CORPORATION ARIZONA Suite 160 5620 North Kolb Road Tucson ARIZONA 85750
Assignment Recorded	ASSIGNMENT RECORDED
Attorney of Record	Dan Hubert
Type of Mark	TRADEMARK. SERVICE MARK
Register	PRINCIPAL
Live/Dead Indicator	LIVE

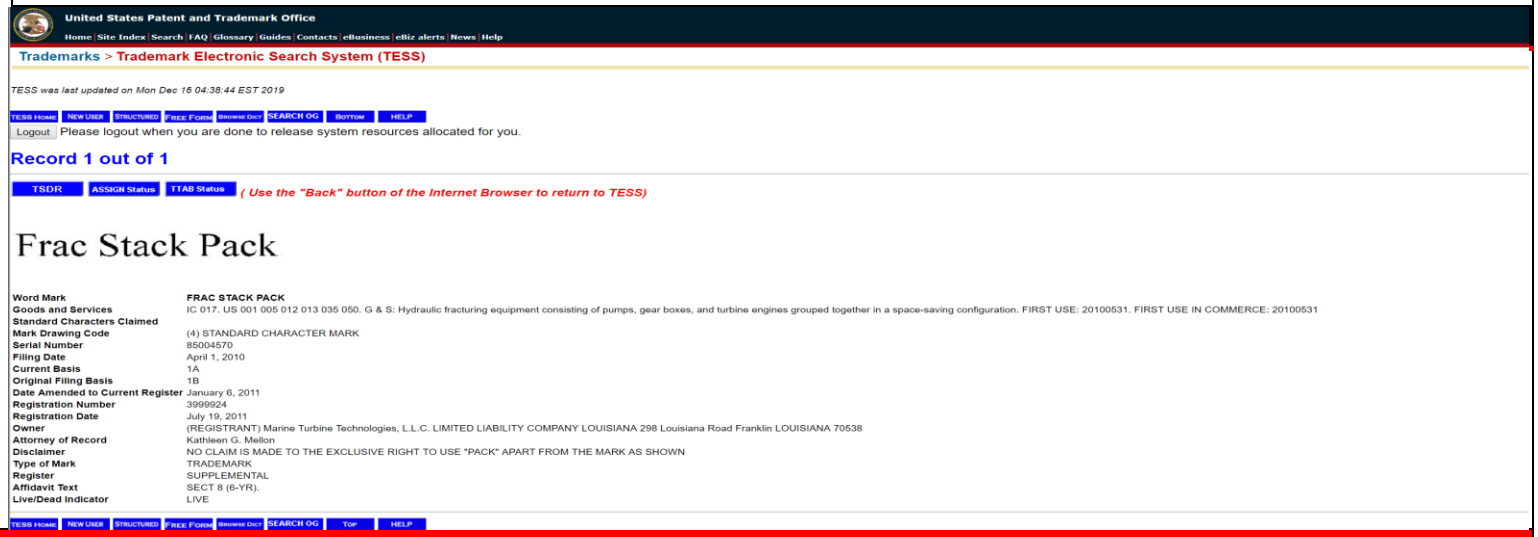
17

TRADEMARK **Registration No. 3999924**

FRAC STACK PACK

GOODS AND SERVICES Hydraulic fracturing equipment consisting of pumps, gear boxes and turbine engines grouped together in a space-saving configuration.

ASSIGNEE **Marine Turbine Technologies, LLC**



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Frac Stack Pack

Word Mark	**FRAC STACK PACK**
Goods and Services	IC 017. US 001 005 012 013 035 050. G & S: Hydraulic fracturing equipment consisting of pumps, gear boxes, and turbine engines grouped together in a space-saving configuration. FIRST USE: 20100531. FIRST USE IN COMMERCE: 20100531
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Filing Date	April 1, 2010
Current Basis	1A
Original Filing Basis	1B
Date Amended to Current Register	January 6, 2011
Registration Number	3999924
Registration Date	July 19, 2011
Owner	(REGISTRANT) Marine Turbine Technologies, L.L.C. LIMITED LIABILITY COMPANY LOUISIANA 298 Louisiana Road Franklin LOUISIANA 70538
Attorney of Record	Kathleen G. Mellon
Disclaimer	NO CLAIM IS MADE TO THE EXCLUSIVE RIGHT TO USE "PACK" APART FROM THE MARK AS SHOWN
Type of Mark	TRADEMARK
Register	SUPPLEMENTAL
Affidavit Text	SECT 8 (6-YR).
Live/Dead Indicator	LIVE

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