A system and method for an integrated structural welding system (10) is designed to protect the components of the system against accidental damage and undue stresses. Furthermore, the system (10) provides ready access to user interfaces (82, 84, 60, 62, 71, 105) and other resources required by an operator during structural welding processes to improve work flow efficiency.
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STRUCTURAL WELDING SYSTEM

REFERENCE TO RELATED APPLICATIONS

[0001] This application is based on provisional application Serial Number 60/903,771, filed February 27, 2007, and entitled "STRUCTURAL WELDING SYSTEM," and claims the benefit thereof.

BACKGROUND OF THE INVENTION

[0002] The present invention relates generally to multi-operational welding-type systems and, in particular, to an integrated system for performing the wide variety of tasks performed during structural welding processes.

[0003] Structural welding refers to the process of fabricating structural support structures used in a variety of applications. For example, structural welding often refers to the fabrication of products such as I-beams, girders, and the like using structural steel. The fabrication processes utilized during structural welding can vary greatly but, often, include welding, gouging, and grinding.

[0004] To perform these three primary processes of structural welding, an operator utilizes a welding-type power source, a welding torch, a gouging torch, a gouging air supply, and a grinder. Typically, the welding process is a metal inert gas (MIG) welding process, also referred to as gas metal arc welding (GMAW), or a flux core arc welding (FCAW) process and, in this case, a shielding gas supply and wire feeder are also utilized.

[0005] The welding-type power source, gas supplies, and transmission power receptacles that drive these processes are typically located at the perimeter of the work area and a variety of cords and cables span the distance from the power source, gas supplies, and power receptacles to the specific location of the workpiece where the fabrication process is being performed. This arrangement is advantageous because it allows an operator a relatively high degree of mobility to move about the workpiece, which may extend many
feet. However, this arrangement also presents a number of impediments to efficient workflows.

For example, when switching between welding processes and gouging processes, it is typically necessary to change from a welding torch or gun to a gouging torch. However, generally, storage areas are located at the perimeter of the work area; and the operator is required to leave the workpiece to locate the required torch, contact tip, nozzle, or gouging carbon. As a result, operators often leave unused components at a location about the workpiece where they are susceptible to accidental damage.

Beyond simply switching between welding and gouging components, these two commonly employed processes typically require differing power parameters. As such, an operator must traverse the distance between the workpiece and the welding-type power source, where the controls for selecting current and voltage characteristics are located. Accordingly, some operators forego selection of proper power parameters for a given process and attempt to weld using gouging power parameters or vice versa.

As addressed above, structural welding processes often employ MIG welders. Accordingly, a wire feeder is utilized that drives a consumable electrode through a cable to a welding torch. Due to the need to avoid inordinately lengthy cables extending between the wire feeder and the welding gun and the need for an operator to adjust wire feeder parameters, the wire feeder is typically located near the workpiece. In an effort to maintain operator mobility about the workpiece, the wire feeder is often mounted on a wheeled cart or a beam extending on a rotatable axis. However, this configuration results in a significant potential for damaging the wire feeder.

First, as addressed above, a number of cables, including gas supply and power cables, extend from the welding power source, transmission power receptacle, and gas sources located at the periphery of the work area and, typically, become intertwined into "nests" around the workpiece. Beyond presenting an impediment to operator mobility, these cables present a significant impediment to moving the wire feeder using a wheeled cart and can even result in the cart being overturned.
Second, it is common for an operator to use the welding cable, which extends from the welding torch, as a "leash" through which to pull the wire feeder to a desired location or direction. Pulling the wire feeder about using the welding cable unduly stresses the wire feeder and the connection between the wire feeder and the welding system. Over time, these stresses can cause significant wear and damage to one or both of the wire feeder and welding cable. For example, the point of connection between the wire feeder and welding cable can become bent or otherwise deformed, which results in improper feeding of the wire into the welding cable. Furthermore, the power cable extending from the welding-type power source to the wire feeder can become damaged or disconnected as the wire feeder is pulled about.

Third, by arranging the wire feeder proximate to the workpiece, which may be a large piece of structural steel or similar heavy metal, the wire feeder is subjected to an increased risk of damage from components in the surrounding environment. For example, when moving an I-beam through the work area, even a relatively small impact of the I-beam against the wire feeder can cause significant damage to the wire feeder.

Therefore, it would be desirable to have a system for performing structural welding processes that protects the components of the system against accidental damage and undue stresses. Furthermore, it would be desirable to have a system that provides ready access to user interfaces and other resources required by an operator during structural welding processes to improve work flow efficiency.

BRIEF SUMMARY OF THE INVENTION

The present invention overcomes the aforementioned drawbacks by providing an integrated structural welding system.

In accordance with one aspect of the present invention, a system is disclosed that includes a welding-type power source configured to deliver welding-type power for a variety of welding-type processes. The system also includes a gouging torch connected to the welding-type power source to
receive welding-type power during a gouging-type process. A wire feeder is also connected to the welding-type power source to receive welding-type power during a welding-process. A controller is configured to coordinate operation of the wire feeder and the gouging torch to perform only one of the gouging-type process and the welding-type process at a given time.

[00015] In accordance with another aspect of the present invention, a portable wire feeder system is disclosed that includes a wire feeder configured to deliver a consumable wire for a welding-type process. A welding cable extends from the wire feeder to receive the consumable wire from the wire feeder and deliver the consumable wire to a weld. The portable wire feeder system includes a support structure supporting the wire feeder that includes at least one of a plurality of wheels and a pivotal connection to facilitate repositioning of the wire feeder. A strain protection system extends from the support structure to engage the welding cable to transfer forces applied to the welding cable to adjust a position of the wire feeder using the welding cable to the support structure.

[00016] In accordance with yet another aspect of the present invention, a portable support structure is disclosed that includes a support structure having a plurality of storage systems including a welding torch storage system configured to store a welding-type torch arranged at one end of a welding cable. The portable support structure also includes a cable path supported by the support structure and configured to receive a power cable extending from a welding-type power source to deliver welding-type power through the welding cable to the welding-type torch to perform a welding-type process. A strain protection system is also supported by the support structure to engage the power cable and secure the power cable in the cable path.

[00017] In accordance with still another aspect of the present invention, a multi-operational welding-type system is disclosed that includes a wire feeder connected to a remotely located welding-type power source to receive welding-type power to perform a welding-type process. A gouging torch is also connected to the remotely located welding-type power source to receive welding-type power to perform another welding-type process. A support
structure is included that supports the wire feeder and includes a process selection switch configured to allow selection of only one of the welding-type process and another welding-type process at a given time.

[00018] In accordance with one aspect of the present invention, a wire feeder system is disclosed that includes a wire feeder configured to receive welding-type power from a welding-type power source to perform a welding-type process. The wire feeder system also includes a support structure surrounding at least a portion of the wire feeder and configured to permit the wire feeder to be moved independently from the welding-type power source. An auxiliary power outlet configured to deliver transmission-type power and/or a compressed air outlet configured to deliver a supply of compressed air is arranged on one of the wire feeder and the support structure.

[00019] In accordance with another aspect of the present invention, a welding-type system is disclosed that includes a welding-type power source configured to deliver welding-type power for a welding-type process. The welding-type power source is free of user interface devices configured to select operational parameters of the welding-type process. The welding-type system also includes a wire feeder connected to the welding-type power source to receive welding-type power during a welding-process and a user interface device arranged on the wire feeder that is configured to receive a user-selected welding parameter. A controller is configured to receive an indication of the user-selected operational parameter from the user interface device and control operation of the welding-type power source during the welding-type process based on the user-selected welding parameter.

[00020] In accordance with yet another aspect of the present invention, a welding-type system is disclosed that includes a control cable having a non-conductive exterior housing surrounding a conductive interior configured to conduct control signals between a welding-type power source and a remote control device. The welding-type system also includes a combined power and gas delivery cable that includes a welding-type power delivery cable having a non-conductive exterior housing surrounding a conductive interior configured to conduct welding-type power. The combined power and gas delivery cable
also includes a gas delivery cable having a housing surrounding a gas flow path through which welding-type power cable extends. A removable housing is included that surrounds the combined power and gas delivery cable and the control cable.

[00021] In accordance with another aspect of the present invention, a welding-type system is disclosed that includes a control cable having a non-conductive exterior housing surrounding a conductive interior configured to conduct control signals between a welding-type power source and a remote control device. The welding-type system also includes a multiple-gas delivery cable that includes a first gas delivery cable having a first housing surrounding a first gas flow path through which a first gas flows. The multiple-gas delivery cable further includes a second gas delivery cable having a second housing surrounding the first gas flow path and a second gas flow path through which a second gas flows and is isolated from the first gas by the first housing. A removable housing is included that surrounds the multiple-gas delivery cable and the control cable.

[00022] In accordance with still another aspect of the present invention, a welding-type system is disclosed that includes a control cable having a non-conductive exterior housing surrounding a conductive interior configured to conduct control signals between a welding-type power source and a remote control device. A welding-type power delivery cable is included that has a non-conductive exterior housing surrounding a conductive interior configured to conduct welding-type power. Also, a first gas delivery cable is included that has a first housing surrounding a first gas flow path through which a first gas flows. In addition, a second gas delivery cable is included that has a second housing surrounding a second gas flow path through which a second gas flows and an auxiliary power cable is included that is configured to conduct transmission-type power. A removable housing surrounds the control cable, the welding-type power delivery cable, the first gas delivery cable, the second gas delivery cable, and the auxiliary power cable.

[00023] Various other features of the present invention will be made apparent from the following detailed description and the drawings.
BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[00024] The invention will hereafter be described with reference to the accompanying drawings, wherein like reference numerals denote like elements, and:

[00025] Fig. 1 is a perspective view of a multi-operational welding-type system in accordance with the present invention;

[00026] Fig. 2 is a partial perspective view of a strain protection system in accordance with the present invention;

[00027] Fig. 3 is a partial side-elevational view of the wire feeder and associated support structure of Fig. 1 including auxiliary power outlets in accordance with the present invention;

[00028] Fig. 4 is a partial perspective view of another strain protection system and an air distribution system in accordance with the present invention;

[00029] Fig. 5 is a front elevational view of a wire feeder system and associated support structure of the multi-operational welding-type system of Fig. 1;

[00030] Fig. 6 is a perspective view of wire feeder system and associated support structure arranged in a beam mounting configuration in accordance with the present invention; and

[00031] Fig. 7 is a cross-sectional view of an umbilical cord cable system of Fig. 1 including multi-path cables in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[00032] Referring now to Fig. 1, a multi-operational welding-type system 10 designed for fabrication processes, such as structural welding-type fabrication processes, is shown. As will be described, the multi-operational welding-type system 10, when configured for structural welding operations, is typically designed to perform welding processes, gouging-type processes, and grinding processes. While the illustrated multi-operational welding-type system 10 includes components specifically configured to perform metal inert gas (MIG) welding processes, gas metal arc welding (GMAW), or flux core arc
welding (FCAW), the multi-operational welding-type system 10 may be designed to perform any of a variety of welding and welding-type processes, such as tungsten inert gas (GTAW) welding processes, stick welding processes or shielding metal arc welding processes (SMAW), plasma cutting processes, and the like. Accordingly, reference to welding-type systems, welding-type components, and welding-type power may include any of a wide variety of welding systems, plasma cutting systems, induction heating systems, and the like.

[00033] Regardless of the specific components or the particular processes to be performed, the multi-operational welding-type system 10 includes a welding-type power source 12 and a support structure 14, typically formed as a cart, carriage, or the like, that is independently movable from the welding-type power source 12. To facilitate movement, the support structure 14 is supported on a plurality of wheels 16 and is connected to the welding-type power source 12 through a series of cables that, as will be described, are advantageously arranged inside a removable housing to from a single umbilical cord 18. Specifically, as will be described, the umbilical cord houses a plurality of cables that, for example, may include a welding power cable 20, an auxiliary power cable 22, one or more gas supply cables 24 (e.g., a shielding gas hose and an air supply hose), and a control cable 26. As will be described, the control cable 26 allows the selection and control of a variety of process from the user interfaces included at the support structure 14. To facilitate such control, it is contemplated that a variety of conductive paths may be included in the control cable 26 and, in some cases, additional conductive cables, such as a voltage sensing lead, may be included in the umbilical cord 18. While it is contemplated that the umbilical cord 18 may not include a grounding cable 28 to facilitate maximum mobility of the support structure 14, in some cases, the grounding cable 28 may be included in the umbilical cord 18. Similarly, in some cases the welding power cable 20 or auxiliary power cable 22 may be removed from the umbilical cord 18.

[00034] The support structure 14 includes a tray 30 supported on the plurality of wheels 16. A plurality of legs 32 extends up from the tray 30 to
support a substantial planar worksurface 34 thereabove. The worksurface 34 provides a preferably flat surface on which an operator can arrange documents, additional or replacement components, and the like. A retractable lift eye 35 may be included. In this regard, the lift eye 35 may be extended above the worksurface 34 when needed and then repositioned under the worksurface 34 when not in use.

[00035] A wire feeder 36 is supported on the tray 30 and is arranged between the plurality of legs 32. In this regard, the legs 32, as well as the worksurface 34, form a cage surrounding the wire feeder 36 that protects the wire feeder 36 from accidental damage. As is conventional in MIG and other welding-type systems, a welding cable 38 extends from the wire feeder 36 to a welding torch 40. The support structure 14 includes a pair of cable supports 41 around which the welding cable 38 can be wrapped and holster 42 configured to receive the welding torch 40 for storage in a suspended position above a floor 44.

[00036] The support structure 14 includes a strain relief or protection system 46 that is designed to protect the wire feeder 36 and the connection between the wire feeder 36 and welding cable 38 from damage caused by forces exerted on the wire feeder 36 and welding cable 38 when the support structure 14 is moved by pulling or otherwise moving the welding cable 38. Specifically, referring to Fig. 2, one configuration of a strain protection system 46 is illustrated in detail. In this configuration, the welding cable 38 is designed to extend proximate to a leg 32 of the support structure 14. A bracket 47 is mounted to the leg 32 through a pivot connection 48 and a removable connection 49. Alternatively, the strain protection system 46 may include a bracket 116 that stands independently from the legs 32, such as illustrated in Figs. 1, 5, and 6. In any case, the removable connection 49, for example, a threaded shaft and nut, can be released to allow the bracket 47 to pivot about the pivot connection 48. The welding cable 38 is arranged under the bracket 47 and, thereby, affixed to the leg 32 when the removable connection 49 is reengaged.
By fastening the welding cable 38 against the leg 32 of the support structure 14 or other fixed structure, an operator can use the welding cable 38 to reposition or move the support structure 14 without damaging the wire feeder 36 of Fig 1, or the connection point between the welding cable 38 and the wire feeder 36. That is, an operator can safely pull on the welding cable 38 to move the support structure 14 on the associated wheels 16 and the strain protection system 46 serves to transfer the forces that would otherwise be applied to the wire feeder 36 and connection point between the wire feeder 36 and welding cable 38 to the support structure 14, which is specifically designed to withstand such forces. Therefore, the strain protection system 46 and support structure 14 work in concert to protect the wire feeder 36 against damage.

In addition to the strain protection system 46, it is contemplated that a cable protection system 50 may be included to protect the welding cable 38 from being damaged, in particular, when pulled or moved in an effort to move the support structure 14. The cable protection system 50 is formed from a substantially rigid material, such as a metal, that extends from the strain protection system 46 along a portion of the welding cable 38. The cable protection 50 is designed to keep the welding cable 38 from being unduly stressed or pulled into a sharp angle that could damage the welding cable 38 or the consumable wire being fed therethrough. That is, the cable protection system 50 is designed to work in concert with the strain protection system 46 by dispersing the forces that would otherwise be applied to the feeder 36 and connection to the weld cable 28 when pulling on the weld cable 38 to move the support structure 14.

Referring again to Fig. 1, beyond the wire feeder 36 and associated welding components, the support structure 14 is designed to support, organize, and store a variety of components and devices. A gouging torch 51 and associated gouging cable 52 are also supported by the support structure 14. As best illustrated in Fig. 3, another cable support 53 extends from the support structure 14 to receive the gouging torch 51 and gouging cable 52 in a coiled arrangement similar to that described above with respect
to the welding torch 40 and welding cable 38. Additionally or alternatively, a
grinder holster 54 may be included. The gouging cable 52 connects the
gouging torch 51 to the support structure 14 through a gouging power cable
connection 55, as shown in Fig. 5, that secures the gouging cable 52 thereto to
protect the gouging cable 52 from being pulled from a gouging-power
connection (not shown) through which power is delivered from the welding-
type power source 12 to the gouging torch 51 to perform a gouging or gouging-
type process. Air pressure is supplied to the gouging torch 51 through air
supply connection 71 in Fig. 5.

[00040] Additionally, a grinder 56 and associated grinding cable are also
supported by the support structure 14, for example, through the holster 54
illustrated best in Fig. 3. Like the gouging cable 52, the grinding cable 58
connects the grinder 56 to the support structure 14. Specifically, as will be
described, the grinding cable connects the grinder 56 to either a compressed
air receptacle or auxiliary power receptacle to receive either compressed air or
transmission-type power, respectively, to perform a grinding process.

[00041] In particular, referring now to Fig. 3, a leg 32 of the support
structure 14 includes a plurality of input and output connection points. An
auxiliary power output receptacle 60 and is included. The auxiliary power
output receptacle 60 is configured to deliver transmission-type AC power to
drive devices designed to receive traditional 50 or 60 Hz AC power, for
example, some grinders 56. As illustrated in Figs. 1 and 5, a compressed air
outlet receptacle 62 is configured to deliver compressed air to drive pneumatic
devices, such as some grinders 56. Accordingly, the support structure 14
includes integrated output receptacles 60, 62 that are designed to provide a
source of driving power for a wide variety of devices. By providing the
integrated output receptacles 60, 62, the long cords that are typically used to
connect devices to remotely located power and compressed air sources are no
longer necessary. In fact, retractable cables may be coupled with the
integrated output receptors 60, 62 to further facilitate cable management by
retracting cables back into the support structure 14 when unneeded. When
coupled with the above-described storage devices 41, 42, 53, 54 cable management and an organized work environment are readily facilitated.

[00042] A plurality of input connection points are also provided that are designed to receive the welding power cable 20, auxiliary power cable 22, one or more gas supply cables 24, and control cable 26. In particular, as shown in Fig. 3, a plug or similar coupling device 64 is provided that is designed to engage the auxiliary power cable 22 to receive the above-described transmission-type AC power carried by the auxiliary power cable 22 and deliver the power to the auxiliary power output receptacle 60. Additionally, as illustrated in Fig. 4, a gas distribution system 65 and shielding gas coupling 66 are included. The couplings 65, 66, which may be quick-connection couplings, are designed to receive the above-described one or more gas supply cables 24, specifically, a compressed air coupling and a shielding gas cable, respectively. As will be described below with respect to Fig. 7, these cables may be individual cables that are dedicated to carrying either the shielding gas or compressed air or these cables may be part of a composite cable designed to carry multiple gas and/or power connection.

[00043] It is contemplated that one or more valves may be included to regulate the flow and distribution of gases from the couplings 65, 66. For example, the gas distribution system 65 is formed as a T-link having a first output 67 that provides a continuous flow of compressed air to the "work air" or auxiliary air output 62 on the face of the support structure 14. The gas distribution system 65 also has a second output 68 having a valve 69 arranged therein to control the flow of air to a gouge air output 71 that, as illustrated in Fig. 5, is also located on the face of the support structure 14. The valve 69 is configured to coordinate the flow of air to the gouge air output 71. Specifically, the valve 69 may be controlled by the wire feeder 36 or, as will be described, a operational selection switch to selectively direct gas to the gouging torch 51 only when a gouging process is selected. Alternatively or additional, the valve 69 may be coupled to a dedicated user-interface device, beyond the traditional valve and user interface that the gouging torch 51 typically includes, such as a user interface integrated into the support structure or other area. Furthermore,
it is contemplated that multiple valves may be integrated into the wire feeder 36. For example, a valve for controlling the flow of shielding gas may be integrated into the wire feeder 36.

[00044] Continuing with respect to Fig. 4, another strain relief/protection system 70 is provided that is advantageous for protecting the connection of the welding power cable 20, auxiliary power cable 22, one or more gas supply cables 24, and control cable 26 with the wire feeder 36 and support structure 14. The strain protection system 70 includes a cable path 72 that extends up from the tray 30 of the support structure 14 and is configured to receive the umbilical cord 18 and cables 20, 22, 24, 26 arranged therein. A plurality of parallel pins 74, 76 extend across the cable path 72 along with an axel 78 of the wheels 16 to form a tortured path through which the umbilical cord 18 is routed. As illustrated, the umbilical cord 18 is arranged to extend under the first pin 74, over the axel 78, and under the second pin 76. However, it is contemplated that the umbilical cord 18 may be arranged in other configurations. Furthermore, although the pins 74, 76 and the axel 78 are aligned at a common distance above the tray 30, it is contemplated that the pins 74, 76 and axel 78 may be offset to increase or decrease the degree of torture along the cable path 72. Also, the axel 78 may be replaced by a pin. Further still, though not illustrated, it is contemplated that the pins 74, 76 and any additional pins may be mounted perpendicularly, with the axle removed from the system, and the umbilical cord 18 routed through the tortured path of pins and covered with a plate or similar securing device. In any case, the strain protection system 70 serves to lock the umbilical cord 18 and the individual cables 20, 22, 24, 26 arranged therein in the cable path 72. Therefore, when the support structure 14 is moved about, the cables 20, 22, 24, 26 are not inadvertently disengaged from the connection points including, for example the welding power cable, shielding hose, air hose, control cable, and auxiliary power cable.

[00045] Beyond the above-described storage components, including the tray 30, the holsters 42, 54, and the cable supports 41, 53, it is contemplated that the support structure 14 may include a drawer or tray or other storage
compartments. As described above, the worksurface 34 provides one storage area that can be used to store documents, notes, replacement parts, and the like during operation. On the other hand, a drawer may be designed for longer-term storage of such resources. For example, the drawer may be used for over-night storage or may house resources that require additional protection from the work environment during operation. Additionally, it is contemplated that the drawer may be lockable.

[00046] One or more handles 79 may be included that are integrated into the worksurface 34. Additionally or alternatively, as shown in Figs. 1 and 3, a T-handle 80 may be included that is supported on the tray 30. It is contemplated that the T-Handle 80 may include a base 81 that is spring loaded to bias the T-handle 80 into an upright position, such as illustrated in Fig. 1. Additionally or alternatively, the handle may be integrated into the worksurface 34.

[00047] The support structure 14 includes at least one user-interface device 82. As illustrated, the user-interface device 82 may include a multi-position switch or dial but may include a variety of other interface components, such as slidable switches, digital interfaces, and the like. The user-interface device 82 is designed to cooperate with the wire feeder 36 to control operation of the multi-operational welding-type system 10. Specifically, the user-interface device 82 and, as will be described, interface devices 84 included on the wire feeder 36 are designed to control operation of the multi-operational welding-type system 10. Accordingly, the welding-type power source 12 is substantially free from control or interface devices.

[00048] It is contemplated that the welding-type power source 12 may include only an "ON/OFF" switch 86 and a breaker switch 87. In this regard, unlike conventional welding-type power sources, the welding-type power source 12 of the multi-operational welding-type system 10 is preferably free of traditional interface devices that allow for the selection of operational parameters, such as power characteristics and the like. Instead, all user-selected parameters and control operations are selected using the user interfaces 82, 84 of the wire feeder 36 and support structure 14.
The breaker switch 87 is included to discontinue the delivery of power from the welding-type power source 12, should the current being drawn from the welding-type power source 12 exceed a predetermined threshold. Accordingly, an operator performing, for example, a grinding process can drive the process without needing to monitor power-draw tolerances. Rather, should a process draw an excess of current, the breaker switch 87 will automatically trip and discontinue the supply of the from the welding-type power source 12. To re-enable the supply of power from welding-type power source 12, an operator need only move the breaker switch 87 from the tripped position.

In the illustrated configuration, the user-interface device 82 is a mechanical three-position switch that can be moved between three positions including a "welding" position 88, a "gouging" position 90, and an "off" position 92. When the user-interface device 82 is moved to one of the positions 88, 90, 82, the wire feeder 36 and, more particularly, a controller generally designated by arrow 37 is disposed in the support structure. The controller 37 may be integrated in the wire feeder 36, but also may be located elsewhere. In operation, the controller 37 identifies the current position of the switch and, as will be described, controls the operation of the multi-operational welding-type system 10. As described above, the welding-type power source 12 is preferably free of user-interface devices and, thus, the user-interface devices 82, 84 of the support structure 14 and the wire feeder 36 act as the primary control and interface devices.

Specifically, the controller 37 monitors the position of the user-interface device 82 to determine the mode of operation. As stated above, the controller 37 is preferably integrated within the wire feeder 36 but may be arranged in any of a variety of locations, such as in the support structure 14. That is, based on the current position of the user-interface device 82, the controller 37 commands the welding-type power source 12 by sending control commands over the control cable 26 that cause the welding-type power source 12 to deliver power to the welding torch 40 for a desired welding process.

Referring now to Fig. 5, the operational parameters, including power parameters, for a desired gouging or welding process are entered
through the user interface 84 of the wire feeder 36. The user interface 84 of
the wire feeder 36 includes a first display 94, a second display 96, an output
selection dial 98, and a wire speed or wire-diameter selection dial 100.
Alternatively, the user interface 84 may be arranged in a side-by-side
arrangement. The first display 94 is configured to display voltage information
relevant to the currently selected process and the second display 96 is
configured to display wire speed and/or amperage information relevant to the
currently selected process. That is, the displays 94, 96 are configured to
display information based on the currently selected process. The output
selection dial 98 and the wire speed or wire-diameter selection dial 100 are
configured to quickly and easily allow an operator to select the operational
parameters of a given process. For example, in accordance with one
embodiment that will be described below, the output selection dial 98 and the
wire speed or wire-diameter selection dial 100 may also provide a simplified,
synergic parameter selection process.

[00053] For example, referring now to Figs. 1 and 5, when the operator
desires to perform a welding process, the operator moves the user-interface
device 82 to the welding position 88. The controller 37 identifies the current
position of the user-interface device 82 and controls the components of the
multi-operational welding-type system 10 to perform the welding-type process.
In particular, the controller 37 directs the power delivered from the welding-
type power source 12 to the welding torch 40. More particularly, power is
directed to the welding torch 40 and no power is delivered to the gouging torch
51. In this regard, the controller 37 is configured to coordinate operation of the
welding torch 40 and the gouging torch 51 to perform only a welding process
and not a gouging process.

[00054] To aid the operator in selecting the proper operational
parameters, the operational parameters used during the previous welding
process are displayed on the first display 94 and the second display 96. In
particular, the first display 94 displays the voltage used during the previous
welding process. Similarly, the second display 96 displays the wire feed speed
used during the previous process. If changes to these operational parameters
are desired, the operator uses the output selection dial 98 to adjust voltage, and dial 100 to adjust the wire feed speed. [00055] Alternatively, the operator can use the wire-diameter selection dial 100 to adjust the diameter of wire 102 being used during the welding process and allow the controller 37 to select the proper operational parameters. As described above, it is contemplated that the multi-operational welding-type system 10 is particularly well suited for structural welding/fabrication applications. When performing structural welding processes, only a few types of consumable wire 102 are typically used. Specifically, either AWS Classification E71T-1 or E70T-1 welding wire are commonly employed. To simplify the selection of operational parameters, it is contemplated that the wire-diameter selection dial 100 may be used to choose between these two common wire diameters or other wire types/diameters. Once the proper diameter has been selected using the wire-diameter selection dial 100, the wire feeder 36 automatically selects the proper voltage and wire feed speed and displays the operational parameters on the displays 94, 96. [00056] As illustrated in Fig. 5, it is contemplated that the support structure 14 may be designed to support a spool 104 of consumable wire 102. This further facilitates the portability of the support structure 14 by integrating the wire source 102, 104 therein. It is contemplated that the support structure 14 may include a spool arm 105 that extends above the tray 30 of the support structure 14. While the spool arm 105 may be fixed, it is contemplated that the spool arm 105 may be configured to telescope outward along arrow 106 to an extended position to facilitate placement of the spool 104 on the spool arm 105. Thereafter, the arm may be retracted back into the operational position shown in Fig. 5 to deliver wire 102 from the spool 104 to the wire feeder 36 during the welding process. Furthermore, though not illustrated it is contemplated that the support structure 14 may be configured to receive a spool 104 of consumable wire 102 in a horizontally mounted arrangement. In this regard, the overall height of the support structure 14 may be further reduced and portability and maneuverability further increased.
Further still, as illustrated in Fig. 3, it is contemplated that the spool arm 105 may telescope vertically along arrow 109. Accordingly, the spool arm 105 may be raised to enable an individual to load the spool 104 onto the spool arm 105 without needing to bend down to the level of the spool arm 105. That is, instead the spool arm 105 is elevated to the level of a spool 104 being held by an individual. Therefore, the process of loading a spool 104 onto the spool arm 105 is less strenuous.

Once the operational parameters are selected, the operator uses the welding torch 40 to initiate the welding process, whereby the wire feeder 36 controls the delivery of power from the welding-type power source 12 to the welding torch 40 using commands communicated over the control cable 26 and draws consumable wire 102 from the spool of wire 104 and delivers the consumable wire 102 to the welding torch 40 to effectuate the welding process according to the selected operational parameters. During the welding process the display 96 is configured to display amperage information, specifically, the number of amps being drawn during the welding process. Likewise, the display 94 is configured to display actual voltage during the welding process.

When the operator desires a change from a welding process using the welding torch 40 to a gouging process (or other welding process, such as stick welding) using the gouging torch 51, the user-interface device 82 is moved from the welding position 88 to the gouging position 90. While, generally, it is contemplated that the gouging torch 51 will be used for gouging processes, it is contemplated that the connection point for the gouging torch 51 may be used for other processes, such as stick welding. In this regard, reference to gouging processes or gouging-type processes or processes performed using the gouging torch 51 may also include other processes, such as stick welding. During the gouging process the display 96 is configured to display amperage information, specifically, the number of amps being drawn during the gouging process. Likewise, the display 94 is configured to display actual voltage during the gouging process.

The positional change of the user-interface device 82 is identified by the controller 37 and causes the controller 37 to discontinue the supply of
power to the welding torch 40 and direct power from the welding-type power source 12 to the gouging torch 51. In this regard, the controller 37 is configured to coordinate operation of the wire feeder 36, the power source 12, and the gouging torch 51 to perform only one of the gouging process or the welding-type process at a given time.

[00061] In a manner similar to the selection of operational parameters for a welding process, the operator enters desired operational parameters for the gouging process through the user interface 84 of the wire feeder 36. As with the selection of the welding process, operational parameters used during a previous gouging process are loaded and displayed on the displays 94, 96. Specifically, the first display 94 displays voltage information and the second display 96 displays the percentage of power source output to be delivered to the gouging torch 51. Should changes be desired, the operator adjusts the displayed operational parameters using the output selection dial 100. During the gouging process, the second display 96 switches from displaying the percentage of power source output to be delivered to the gouging torch 51 to displaying the number of amps being drawn during the gouging process. In accordance with one embodiment, when a process, such as a gouging or welding process is discontinued, the display continues to display the information displayed during the process for a period of time. For example, when the gouging process is discontinued, it is contemplated that the second display 96 continues to display the number of amps being drawn during the gouging process for a period of time, for example 5 seconds.

[00062] The above-described system allows an operator to quickly and easily switch between welding processes and gouging processes without needing to constantly monitor or adjust operational parameters. Furthermore, when changes to the operational parameters or previous operational parameters are desired, the operator is not required to traverse the distance back to the welding-type power source 12, but can make all desired changes, including switching between the isolated processes of welding and gouging, directly from the remote location of the support structure 14. However, it is
contemplated that the above-described user interface 84 of the wire feeder 36 may be foregone in favor of a traditional wire feeder user interface.

[00063] When the operator has completed the welding and gouging process, the user-interface device 82 is moved to the off position 92, whereby, the controller 37 causes the welding-type power source 12 to discontinue the delivery of welding or gouging power and enter a full "off" mode. That is, moving the user-interface device 82 into the off position 92 causes the welding-type power source 12 to turn "off in a manner similar to using the "ON/OFF" switch 86. Accordingly, the "ON/OFF" switch 86 acts as a secondary, manual switch to turn the welding-type power source to "off.

Additionally, if the user-interface device 82 is moved from the welding position 88 or gouging position 90 while a welding or gouging process is being performed and, thus, the welding torch 40 or gouging torch 51 is drawing power from the welding-type power source 12, the controller 37 controls the welding-type power source to enter standby mode and discontinue the delivery of power.

[00064] In many cases, an operator may move the user-interface device 82 to the off position 92 when additional processes, such as grinding processes, are to be performed. As described above, the support structure 14 includes integrated outputs 60, 62 that provide electrical and pneumatic power, respectively, to auxiliary devices, such as grinders 56.

[00065] When the welding, gouging, and grinding processes are complete, the above-described storage elements allow an operator to quickly and easily store all of the components of the multi-operational welding-type system 10. Accordingly, cables, torches, consumables, and the like are not left spanning across a work area where they may cause an impediment to efficient workflow or may become damaged. Rather, all cables and components can be quickly and easily stored on the support structure 14 and only the umbilical cord 18 and grounding cable 28 are left to span the distance between the welding-type power source 12 and the support structure 14.

[00066] Referring now to Fig. 6, it is contemplated that the support structure 14 may not include wheels and, instead, be configured to be mounted
on a horizontal beam 107. Though illustrated as including a spool 104 of consumable wire 102, it is also contemplated that this beam-mounted embodiment may utilize a drum of wire that would be located on the floor below the horizontal beam 107.

[00067] The horizontal beam 107 is connected to a vertical beam 108 through a pivot axis 110 that allows the horizontal beam 107 and support structure 14 to be rotated and repositioned. To facilitate moving the horizontal beam 107 and support structure 14 about the pivot axis 110, it is contemplated that a strain relief/protection system is included. The strain protection system may be arranged as described above with respect to Figs. 1 and 2. On the other hand, it is contemplated that another strain protection system 112 may be used. This strain protection system 112 includes a base 114 that extends under a portion of the wire feeder 36. A bracket 116 extends up from the base 114 to engage the welding cable 38 proximate to the connection of the welding cable 38 to the wire feeder 36. Accordingly, as described above, this strain protection system 112 protects the wire feeder 36 and the connection between the welding cable 38 and wire feeder 36 from forces placed on these components when the welding cable 38 is used to adjust the position of the support structure 14 and the potential damage that those forces can cause. Accordingly, a strain protection system 112 is provided that protects the wire feeder 36 and the connection between the welding cable 38 and wire feeder 36 from damage without incorporating the legs 32 into the strain protection system 112.

[00068] This configuration may be particularly advantageous for beam mountings of the support structure 14, where the wire feeder 36, due to the elevated position, is less prone to accidental damage and, thus, smaller legs 32 that afford less protection but reduce manufacturing costs and the overall weight of the support structure 14 may be used. To this end, it is contemplated that the above-described wheels and brackets may be removable to facilitate beam mounting.

[00069] Referring now to Fig. 7, the umbilical cord 18 is shown in further detail. As generally described above, the umbilical cord 18 includes a housing
120 designed to removably surround a plurality of individual cables. In this regard, the housing 120 may be formed of a semi-ridged material, such as rubber or the like, and include an overlapping portion 122 that can be used to remove or gain access to the cables arranged within the housing 120. Alternatively, the housing may be made of any of a variety of other materials, such as cloth, leather, or the like, that are less ridged. In this case, the overlapping portion 122 may include snaps 123, such as illustrated in Fig. 4, or other securing mechanisms that can be used to enclose the housing 120 about the cables arranged therein, while still allowing ready access to the cables.

[00070] As described above, the cables arranged within the housing 120 may be individual cables, such as illustrated by individual cable 124. The individual cable 124 may be designed to carry electricity or gas to operate as any of the above-described cables 20, 22, 24, 26, 28. However, in some cases, it may be advantageous to utilize cables that include multiple electrical and/or gas flow paths. For example, as illustrated in Fig. 7, one such cable 126 may include first and second paths 128, 130.

[00071] The first path 128 is surrounded by a first housing 132 and the second path 130 is surrounded by a second housing 134. It is contemplated that the first and second paths 128, 130 may be configured to provide a flow path for either welding-type power or gas.

[00072] In accordance with one embodiment, the first path 128 and first housing 132 form a welding-type power delivery cable. In this case, the first housing 132 is a non-conductive housing and the first path 128 is a conductive path configured to conduct welding-type power. The second path 130 may be another conductive path or may be a gas flow path. In either case, the first and second path 128, 130 are isolated.

[00073] In accordance with another embodiment, a multiple-gas delivery cable 136 may be included. Like the above-described welding-type power delivery cable, the multiple-gas delivery cable 136 includes a first housing 138 that surrounds a first path 140, which is a hollow flow path for gas. The multiple-gas delivery cable 136 also includes a second housing 142 surrounding a second path 144 that may be another hollow gas flow path or
may be a conductive flow path. In either case, the first and second path 140, 144 are isolated.

[00074] Theses cables 126, 136 may be particularly advantageous when utilized with systems such as the above-described umbilical cord 18. That is, the cables 126, 136, by combining multiple paths 128, 130, 140, 144 into an integrated cable, reduces the number of individual cables arranged in the umbilical cord 18. For example, the umbilical cord 18 of Figs. 1 and 4 may simply include a control cable having a non-conductive exterior housing surrounding a conductive interior configured to conduct control signals between a welding-type power source and a remote control device and one or more integrated gas and/or power delivery cables. Furthermore, although the above-described example of an integrated gas and/or power cable includes only a first path and a second path, it is contemplated that three, four, or even more paths may be included in a single integrated cable.

[00075] Therefore, the above described system and method provides an integrated structural welding system that protects the components of the system against accidental damage and undue stresses. Furthermore, the above-described system and method provides ready access to user interfaces and other resources required by an operator during structural welding processes to improve work flow efficiency.

[00076] The present invention has been described in terms of the various embodiments, and it should be appreciated that many equivalents, alternatives, variations, and modifications, aside from those expressly stated, are possible and within the scope of the invention. Therefore, the invention should not be limited to a particular described embodiment.
WE CLAIM:

1. A system comprising:
   a welding-type power source (12) configured to deliver welding-type power for a variety of welding-type processes;
   a gouging torch (51) connected to the welding-type power source (12) to receive welding-type power during a gouging-type process;
   a wire feeder (36) connected to the welding-type power source (12) to receive welding-type power during a welding-process; and
   a controller (37) configured to coordinate operation of the wire feeder (36) and the gouging torch (51) to perform only one of the gouging-type process and the welding-type process at a given time.

2. The system of claim 1 further comprising a support structure (14) supporting the wire feeder (36) and having a switch (82) configured to communicate with the controller (37) to switch between selection of the welding-type process and the gouging-type process.

3. The system of claim 2 wherein the switch (82) is further configured to communicate with the controller (37) to disable welding-type processes and gouging-type processes upon one of a selection of a power-off state and a change in selection during one of the welding-type process and the gouging-type process.

4. The system of claim 2 wherein the support structure (14) includes a tray (30) supporting the wire feeder (36) and a cage (32, 34) extending from the tray (30) to at least partially surround the wire feeder (36).

5. The system of claim 2 further comprising a plurality of storage elements (30, 34, 41, 42, 53) supported by the support structure (14), including at least one of a torch storage system, a consumable storage system, a cable storage system, a grinder storage system, and a drawer.
6. The system of claim 2 wherein the support structure (14) includes a work table (34) extending above the wire feeder (36) and having integrated handles formed therein.

7. The system of claim 2 further comprising at least one of an auxiliary power outlet (60) and a compressed air receptacle (62, 71) supported by the support structure (14).

8. The system of claim 2 wherein the support structure (14) includes at least one of a plurality of wheels (16) and a pivot axis (110) to adjust a position of the support structure (14).

9. The system of claim 1 wherein the wire feeder (36) includes a plurality of user-interface devices (82, 84) configured to select operational parameters for the welding-type process and the gouging-type process.

10. The system of claim 9 wherein the controller (37) is arranged in the wire feeder (36) and is configured to receive selected operational parameters from the plurality of user interface devices (82, 84) and control the welding-type power source (12) to deliver welding-type power based on the selected operational parameters for the welding-type process and the gouging-type process.

11. The system of claim 1 wherein the gouging torch (51) and the wire feeder (36) are connected to the welding-type power source (12) through a common umbilical cord (18).

12. The system of claim 11 wherein the umbilical cord (18) includes a removable cable housing (120) surrounding a welding-type power cable (20), a shielding gas cable (24), an auxiliary power cable (22), a compressed air cable (28), and a control cable (26).
13. The system of claim 1 wherein the welding-type power source (12) is free of user interface devices (84) configured to select power parameters.

14. The system of claim 1 wherein the wire feeder (36) includes a user interface device (84) configured to automatically select operational voltage and wire feed speed upon selecting a welding wire diameter.

15. The system of claim 14 wherein the user interface device (84) includes a dial (98, 100).

16. The system of claim 1 further comprising:
   a welding cable (38) extending from the wire feeder (36);
   at least one of a wheeled cart (14) and a rotatable bar mounting supporting the wire feeder (36); and
   a strain protection system (46) extending from the at least one of the wheeled cart (14) and the rotatable bar mounting to engage the welding cable (38) and reinforce the wire feeder (36) against forces applied when adjusting a position of the at least one of the wheeled cart (14) and the rotatable bar mounting by moving the welding cable (38).

17. The system of claim 1 further comprising a tray (30) supporting the wire feeder (36) and at least one of an auxiliary power outlet (60) and a compressed air receptacle (62, 71) supported by the tray (30).

18. The system of claim 17 further comprising a grinder (54) configured to receive operational power from at least one of the auxiliary power outlet (60) and the compressed air receptacle (62, 71) supported by the tray (30).

19. The system of claim 1 wherein the controller (37) is arranged in the wire feeder (36) and is configured to receive selected operational
parameters from a user-interface device (84) of the wire feeder (36) and control the welding-type power source (12) to deliver welding-type power based on the selected operational parameters.

20. The system of claim 19 wherein the controller (37) is further configured to recall selected operational parameters associated with a previous gouging-type process and a previous welding-type process.

21. A portable wire feeder system comprising:
   a wire feeder (36) configured to deliver a consumable wire (102) for a welding-type process;
   a welding cable (38) extending from the wire feeder (36) to receive the consumable wire (102) from the wire feeder (36) and deliver the consumable wire (102) to a weld;
   a support structure (14) including a tray (30) supporting the wire feeder (36), a plurality of legs (32) extending from the tray (30), and at least one of a plurality of wheels (16) and a pivotal connection to facilitate repositioning of the wire feeder (36); and
   a strain protection system (46) having a reinforcement bracket (47) extending substantially surrounding the welding cable (38) and mounted to at least one of a bracket (116) supported by the tray (30) and at one of the plurality of legs (32) to transfer forces applied to the welding cable (38) to adjust a position of the wire feeder (36) using the welding cable (38) to the support structure (14).

22. The system of claim 21 wherein the bracket (116) includes a base (114) mounted to at least one of the wire feeder (36) and the tray (30).

23. The system of claim 21 further comprising cable protectors (50) forming a substantially rigid coil (50) extending from the strain protection system (46) and around the welding cable (38) along a portion of the welding cable (38) proximate to the wire feeder (36).
24. The system of claim 21 wherein the support structure (14) includes a work table (34) supported on the plurality of legs (32) above the tray (30) and wire feeder (36).

25. The system of claim 24 further comprising at least one handle (80) extending from the support structure (14) to facilitate movement of the support structure (14) and having a mounting system having a biasing mechanism (81) configured to maintain the at least one handle (80) in a position proximate to the support structure (14).

26. The system of claim 24 further comprising a lift eye (35) configured to extend above the work table (34) and retract below the work table (34).

27. The system of claim 21 wherein the support structure (14) includes at least one of an auxiliary power outlet (60) and a compressed air outlet (62, 71).

28. The system of claim 21 further comprising at least one of a grinder (54) and a gouging torch (51) supported on the support structure (14).

29. The system of claim 28 further comprising a selector switch (82) configured to select between only one of a welding-type process effectuated using the wire feeder (36) and a gouging-type process effectuated using the gouging torch (51).

30. The system of claim 21 further comprising:
   a welding-type power source (12) configured to deliver welding-type power to the wire feeder (36) to perform a welding-type process;
   a gouging torch (51) connected to the welding-type power source (12) to receive welding-type power to perform a gouging-type process;
a controller (37) configured to coordinate operation of the wire feeder (36) and the gouging torch (51) to perform only one of the gouging-type process and the welding-type process at a given time.

31. The system of claim 30 further comprising a switch (82) configured to communicate with the controller (37) to switch between selection of the welding-type process and the gouging-type process.

32. The system of claim 31 wherein the switch (82) is further configured to communicate with the controller (37) to disable welding-type processes and gouging-type processes upon one of a selection of a power off state and a change in selection during one of the welding-type process and the gouging-type process.

33. The system of claim 21 further comprising a welding-type power cable (20) connecting the wire feeder (36) to a welding-type power source (12) to receive welding-type power thereover and comprising a rear strain protection system (70) extending from the support structure (14) to engage the welding-type power cable (20) and secure the connection between the wire feeder (36) and the welding-type power source (12) against forces applied when adjusting a position of the wire feeder (36) independently from a position of the welding-type power source (12).

34. The system of claim 33 wherein the rear strain protection system (70) includes a tortured path through which the welding-type power cable (20) extends and is engaged to secure the welding-type power cable (20) to the support structure (14).

35. The system of claim 34 further comprising a cable path (72) and a plurality of parallel pins (74, 76, 78) extending through the cable path (72) to form the tortured path.
36. A portable support structure (14) comprising:
    a support structure (14) having a plurality of storage systems including a welding torch storage system (42) configured to store a welding-type torch arranged at one end of a welding cable (38);
    a cable path (72) supported by the support structure (14) and configured to receive a power cable extending from a welding-type power source (12) to deliver welding-type power through the welding cable (38) to the welding-type torch to perform a welding-type process; and
    a strain protection system (70) supported by the support structure (14) and forming a tortured path through which the welding-type power cable (20) extends and is engaged to secure the power cable in the cable path (72).

37. The system of claim 36 further comprising a plurality of parallel pins (74, 76, 78) extending through the cable path (72) to form the tortured path.

38. The system of claim 37 further comprising a plurality of wheels (16) supporting the support structure (14) and an wheel axel (78) connecting at least one of the wheels (16) to the support structure (14) and wherein the wheel axel (78) forms one of the parallel pins (74, 76).

39. The system of claim 36 further comprising a wire feeder (36) supported by the support structure (14) and configured to connect the welding-type power cable (20) to the welding cable (38).

40. The system of claim 39 wherein the strain protection system (70) is further configured to affix the power cable to the support structure (14) to secure the power cable from being disconnected from the wire feeder (36) when a position of the support structure (14) is moved independently of a position of the welding-type power source (12).
41. A multi-operational welding-type system (10) comprising:
   a wire feeder (36) connected to a remotely located welding-type
   power source (12) to receive welding-type power to perform a welding-type
   process;
   a gouging torch (51) connected to the remotely located welding-
   type power source (12) to receive welding-type power to perform another
   welding-type process;
   a support structure (14) supporting the wire feeder (36) and
   including a process selection switch (82) configured to allow selection of only
   one of the welding-type process and the another welding-type process at a
   given time.

42. The system of claim 41 further comprising a controller (37)
   configured to receive a selection indication from the process selection switch
   and coordinate operation of the wire feeder (36) and the gouging torch (51) to
   preclude the wire feeder (36) and the gouging torch (51) from simultaneously
   performing the welding-type process and the another welding-type process.

43. The system of claim 42 wherein the process selection switch (82)
   is further configured to communicate with the controller (37) to disable the
   welding-type process and the gouging-type process upon one of a selection of
   an off state and a change in selection during one of the welding-type process
   and the gouging-type process.

44. The system of claim 42 wherein the controller (37) is further
   configured to recall selected operational parameters associated with a
   previous gouging-type process and a previous welding-type process.

45. The system of claim 41 wherein the support structure (14) includes a tray (30)
   supporting the wire feeder (36) and a plurality of legs (32)
   extending above the tray (30) to support a worksurface (34).
46. The system of claim 45 further comprising at least one of an auxiliary power receptacle (60) and a compressed air receptacle (62, 71) supported by the support structure (14).

47. The system of claim 46 further comprising a grinder (54) configured to be driven by one of power received from the auxiliary power receptacle (60) and compressed air received from the compressed air receptacle (62, 71).

48. The system of claim 45 further comprising a lift eye (35) configured to move between a retracted position below the worksurface (34) and an extended position extending above the worksurface (34).

49. The system of claim 41 further comprising:
   a welding cable (38) extending from the wire feeder (36);
   at least one of a wheeled cart (14) and a rotatable bar mounting forming the support structure (14); and
   a strain protection system (46) extending from the at least one of the wheeled cart (14) and the rotatable bar to engage the welding cable (38) and reinforce the wire feeder (36) against forces applied when adjusting a position of the at least one of the wheeled cart (14) and the rotatable bar by moving the welding cable (38).

50. The system of claim 41 wherein the wire feeder (36) includes a plurality of user interface devices (84) configured to select operational parameters for the welding-type process and the gouging-type process.

51. The system of claim 50 further comprising a controller (37) configured to receive selected operational parameters from the plurality of user interface devices (84) and control the welding-type power source (12) to deliver welding-type power based on the selected operational parameters.
52. The system of claim 51 wherein the controller (37) is arranged in the wire feeder (36).

53. The system of claim 52 wherein the welding-type power source (12) is free of user interface devices (84) configured to select power parameters.

54. The system of claim 41 further comprising an umbilical cord (18) connecting the wire feeder (36) and gouging torch (51) to the welding-type power source (12).

55. The system of claim 54 wherein the umbilical cord (18) includes a removable cable housing (120) surrounding a welding-type power cable (20), a shielding gas cable (24), an auxiliary power cable (22), a compressed air cable (28), and a control cable (26).

56. The system of claim 55 wherein the support structure (14) includes:

   a tray (30) supporting the wire feeder (36);
   a cable path (72) extending from the tray (30) and configured to receive a portion of the umbilical cord (18) extending therethrough; and
   a strain protection system (70) configured to engage the umbilical cord (18) and secure the umbilical cord (18) within the cable path (72) to protect against accidental disconnection of the welding-type power cable (20), the shielding gas cable (24), the auxiliary power cable (22), the compressed air cable (28), and the control cable (26) as the support structure (14) is moved.

57. The system of claim 56 wherein the strain relief system (70) includes a plurality of parallel pins (74, 76, 78) arranged within the cable path (72) to form a tortured path that secures the umbilical cord (18) to the support structure (14).
58. The system of claim 41 wherein the support structure (14) includes:
   a movable tray (30) supporting the wire feeder (36) to facilitate repositioning of the wire feeder (36);
   a plurality of legs (32) extending up from the movable tray (30) to at least partially enclose the wire feeder (36); and
   a strain relief system (46) mounted to one of the tray (30) and one of the plurality of legs (32) and configured to engage a welding cable (38) extending from the wire feeder (36) to protect the wire feeder (36) against forces applied when adjusting a position of the movable tray (30) using the welding cable (38).

59. The system of claim 41 wherein the wire feeder (36) includes a user-interface device (84) configured receive a user-selected welding wire diameter and further comprising a controller (37) configured to receive the user-selected welding wire diameter from the user-interface device (84) and automatically select operational voltage and wire feed speed for the welding-type process based on the user-selected welding wire diameter.

60. The system of claim 59 wherein the user interface device (84) includes a dial (98, 100).

61. A wire feeder (36) system comprising:
   a wire feeder (36) configured to receive welding-type power from a welding-type power source (12) to perform a welding-type process;
   a support structure (14) surrounding at least a portion of the wire feeder (36) and configured to facilitate movement of the wire feeder (36) independently from the welding-type power source (12); and
   at least one of an auxiliary power outlet (60) configured to deliver transmission-type power and a compressed air outlet (62, 71) configured to deliver a supply of compressed air integrated within one of the wire feeder (36) and the support structure (14).
62. The system of claim 61 wherein the support structure (14) includes a tray (30) supporting the wire feeder (36) and a plurality of legs (32) extending up from the tray (30) to protect the wire feeder (36) against accidental damage.

63. The system of claim 62 further comprising a work table (34) supported on the plurality of legs (32) and extending over the wire feeder (36).

64. The system of claim 62 wherein the at least one of the auxiliary power outlet (60) and the compressed air outlet (62, 71) are supported by at least one of the plurality of legs (32).

65. The system of claim 61 further comprising a grinder (54) driven by one of power received from the auxiliary power outlet (60) and air received from the compressed air outlet (62, 71).

66. The system of claim 61 further comprising a gouging torch (51) extending from the support structure (14) and configured to receive welding-type power from the welding-type power source (12) to perform a gouging-type process.

67. The system of claim 66 further comprising a process selection switch (82) configured to electrically isolate the gouging torch (51) and a welding torch (40) connected to the wire feeder (36) and selectively enable one of the wire feeder (36) and the gouging torch (51) to perform the welding-type process and the gouging-type process.

68. The system of claim 67 wherein the process selection switch (82) is integrated in the support structure (14).

69. The system of claim 67 further comprising a controller (37) configured to coordinate operation of the wire feeder (36) and the gouging
torch (51) to perform only one of the gouging-type process and the welding-type process at a given time.

70. The system of claim 69 wherein the controller (37) is arranged in the wire feeder (36).

71. The system of claim 70 wherein the wire feeder (36) includes a user-interface device (84) configured to select operational parameters of the welding-type process and the gouging-type process and the controller (37) is configured to automatically select operational voltage and wire feed speed for the welding-type process upon receiving a welding wire diameter selection from the user-interface device (84).

72. The system of claim 71 wherein the welding-type power source (12) is free of user interface devices (84) configured to select power parameters.

73. The system of claim 71 wherein the controller (37) is configured to control operational parameters of the welding-type power source (12) during the welding-type process and the gouging-type process.

74. The system of claim 71 wherein the controller (37) is further configured to recall selected operational parameters associated with a previous gouging-type process and a previous welding-type process.

75. The system of claim 61 further comprising at least one of a retractable cable extending from the at least one of an auxiliary power outlet (60) and the compressed air outlet (62, 71) and a retractable lift eye (35) extending from the support structure (14).

76. The system of claim 61 further comprising:
   a welding cable (38) extending from the wire feeder (36);
at least one of a wheeled cart (14) and a rotatable bar mounting forming the support structure (14); and
a strain protection system (46) extending from the at least one of the wheeled cart (14) and the rotatable bar to engage the welding cable (38) and reinforce the wire feeder (36) against forces applied when adjusting a position of the at least one of the wheeled cart (14) and the rotatable bar by moving the welding cable (38).

77. The system of claim 61 wherein the support structure (14) includes:
   a tray (30) supporting the wire feeder (36);
   a plurality of cables (20, 22, 24, 26) connecting the wire feeder (36) to the welding-type power source (12);
   a cable path (72) extending from the tray (30) and configured to receive a portion of the plurality of cables (20, 22, 24, 26) extending therethrough;
   a strain protection system (46) configured to engage the plurality of cables (20, 22, 24, 26) and secure the plurality of cables (20, 22, 24, 26) within the cable path (72) to protect against accidental disconnection of the plurality of cables (20, 22, 24, 26) from the wire feeder (36) when the support structure (14) is moved independently from the welding-type power source (12).

78. The system of claim 77 wherein the strain protection system (46) includes a plurality of parallel pins (74, 76, 78) arranged within the cable path (72) to form a tortured path securing the plurality of cables (20, 22, 24, 26) to the support structure (14).

79. The system of claim 61 further comprising an umbilical cord (18) connecting the wire feeder (36) and gouging torch (51) to the welding-type power source (12), wherein the umbilical cord (18) includes a removable cable housing (120) surrounding a welding-type power cable (20), a shielding gas
cable (24), a control cable (26), an auxiliary power cable (22) configured to deliver power to the auxiliary power outlet (60), and a compressed air cable (28) configured to deliver compressed air to the compressed air outlet (62).

80. The system of claim 61 further comprising a spool arm (105) extending from the support structure (14) and configured to telescope to receive a spool of consumable wire (102) for use by the wire feeder (36) during the welding-type process.

81. A welding-type system (10) comprising:

- a welding-type power source (12) configured to deliver welding-type power for a welding-type process, wherein the welding-type power source (12) is free of user interface devices (84) configured to select power parameters of the welding-type process;
- a wire feeder (36) connected to the welding-type power source (12) to receive welding-type power during a welding-process;
- a user interface device (84) arranged remotely from the welding-type power source (12) and configured to receive a user-selected welding parameter; and
- a controller (37) configured to receive an indication of the user-selected operational parameter from the user interface device (84) and control operation of the welding-type power source (12) during the welding-type process based on the user-selected welding parameter received through the user interface (84).

82. The system of claim 81 further comprising:

- a gouging torch (51) configured to receive operational power from the welding-type power source (12) to perform a gouging-type process;
- wherein the user interface device (84) is further configured to receive a user-selected gouging parameter; and
- wherein the controller (37) is further configured to control operation of the welding-type power source (12) during the gouging-type process.
process based on the user-selected gouging parameter received through the user interface (84).

83. The system of claim 82 wherein the controller (37) is configured to coordinate operation of the wire feeder (36) and the gouging torch (51) to perform only one of the gouging-type process and the welding-type process at a given time.

84. The system of claim 83 further comprising a process selection switch (82) configured to receive a user selection of one of the welding-type process and the gouging-type process.

85. The system of claim 84 wherein the controller (37) is further configured to recall a previous user-selected welding parameter when the process selection switch receives a user selection of the welding-type process.

86. The system of claim 84 wherein the controller (37) is further configured to recall a previous user-selected gouging parameter when the process selection switch receives a user selection of the gouging-type process.

87. The system of claim 84 wherein the process selection switch (82) is further configured to communicate with the controller (37) to disable the welding-type process and the gouging-type process upon one of a selection of an off state and a change in the user selection during one of the welding-type process and the gouging-type process.

88. The system of claim 84 further comprising a support structure (14) supporting the wire feeder (36) and wherein the process selection switch (82) is integrated within the support structure (14).

89. The system of claim 84 further comprising a cart (14) supporting the wire feeder (36) and including the process selection switch (82).
90. The system of claim 89 wherein the cart (14) includes a tray (30) supporting the wire feeder (36), a plurality of legs (32) extending from the tray (30) about the wire feeder (36), and a worksurface supported by the plurality of legs (32) above the wire feeder (36).

91. The system of claim 90 wherein the cart (14) includes at least one of a retractable lift eye (35) configured to extend above the worksurface (34), a grinder storage holster (54), and a welding torch storage holster (42).

92. The system of claim 89 wherein the cart (14) includes a spool arm (105) configured to extend into a telescope position to receive a spool of consumable wire (102) and retract into a operational position to deliver the consumable wire (102) to the wire feeder (36) during the welding-type process.

93. The system of claim 89 wherein the cart (14) includes at least one of an auxiliary power outlet (60) and a compressed air outlet (62).

94. The system of claim 93 further comprising an umbilical cord (18) connecting the wire feeder (36) to the welding-type power source (12).

95. The system of claim 94 wherein the umbilical cord (18) includes a removable cable housing (120) surrounding a welding-type power cable (20) and a control cable (26) and at least one of a shielding gas cable (24), an auxiliary power cable (22), and a compressed air cable (28).

96. The system of claim 95 wherein at least one of:
   the welding-type power cable (20) is disposed within one of the shielding gas cable (24) and the compressed air cable (28);
   the control cable (26) is disposed within one of the shielding gas cable (24) and the compressed air cable (28); and
the umbilical cord (18) includes an auxiliary power cable (22) disposed within one of the shielding gas cable (24) and the compressed air cable (28).

97. The system of claim 81 further comprising a display (94, 96) and wherein the controller (37) is configured to display at least one currently-selected operational parameter for a predetermined time period following initiation of the gouging-type process.

98. The system of claim 95 wherein the display (94, 96) is integrated into wire feeder (36) configured to receive welding-type power from the welding-type power source (12) and wherein the user interface (84) is configured to receive at least one welding-type parameter and communicate the at least one welding-type parameter to the controller (37) to control the welding-type power source (12) to effectuate a desired welding-type process based on the at least one welding-type parameter, and wherein controller (37) is configured to display the at least one welding-type parameter for a predetermined time period following initiation of the welding-type process.

99. The system of claim 81 wherein the user interface device (84) is configured to receive a user-selected welding wire diameter and the controller (37) is configured to receive the user-selected welding wire diameter from the user interface device (84) and automatically select an operational voltage and a wire feed speed for the welding-type process based on the user-selected welding wire diameter.

100. The system of claim 99 wherein the controller (37) is configured to recall a previous user-selected welding wire diameter that is superseded by the user-selected welding wire diameter received from the user interface device (84), if the user-selected welding wire diameter differs from the previous user-selected welding wire diameter.
101. A welding-type system (10) comprising:
   a control cable (26) having a non-conductive exterior housing (138, 142) surrounding a conductive interior (128, 130, 140, 144) configured to conduct control signals between a welding-type power source (12) and a remote control device;
   a combined power and gas delivery cable (136) comprising:
      a welding-type power delivery cable having a non-conductive exterior housing (138, 142) surrounding a conductive interior (128, 130, 140, 144) configured to conduct welding-type power;
      a gas delivery cable (136) having a housing surrounding a gas flow path (128, 130) through which welding-type power cable (20) extends; and
      a removable housing (120) surrounding the combined power and gas delivery cable (136) and the control cable (26).

102. The system of claim 101 further comprising an auxiliary power cable (22) arranged with in the removable housing (120) and configured to conduct transmission-type power.

103. The system of claim 102 further comprising a grinder (54) configured to receive power form the auxiliary power cable (22) to perform a grinding process.

104. The system of claim 101 wherein the gas delivery cable (136) is configured to receive one of a shielding gas and compressed air.

105. The system of claim 104 further comprising a grinder (54) configured to be driven by compressed air delivered by the gas delivery cable (136) to perform a grinding process.

106. The system of claim 101 wherein the welding-type power cable (20) connects a welding-type power source (12) configured to deliver welding-
type power for a variety of welding-type processes to a wire feeder (36) to perform a welding-process and wherein the control cable (26) connects the wire feeder (36) to the welding-type power source (12) to control the welding-type power source (12) during the variety of welding-type processes.

107. The system of claim 106 further comprising a gouging power delivery cable connecting the welding-type power source (12) to a gouging torch (51) to conduct gouging power to the gouging torch (51) during a gouging-type process.

108. The system of claim 107 wherein the wire feeder (36) includes a controller (37) configured to control the power source (12) to only deliver one of the welding-type power to the wire feeder (36) over the welding-type power delivery cable and the gouging power to the gouging torch (51) over the gouging power delivery cable at a time.

109. The system of claim 108 wherein the wire feeder (36) includes a user interface (84) configured to receive user-selected characteristics for the gouging power and the welding-type power and wherein the welding-type power source (12) is free of a user interface (84) configured to receive user-selected characteristics for the gouging power and the welding-type power.

110. The system of claim 109 wherein the controller (37) is configured to receive the user-selected characteristics for the gouging power and the welding-type power and control the welding-type power source (12) over the control cable (26) based on the user-selected characteristics.

111. A welding-type system (10) comprising:
- a control cable (26) having a non-conductive exterior housing (138, 142) surrounding a conductive interior (128, 130, 140, 144) configured to conduct control signals between a welding-type power source (12) and a remote control device;
a multiple-gas delivery cable (136) comprising:
  a first gas delivery cable having a first housing (132)
surrounding a first gas flow path (140) through which a first gas flows;
  a second gas delivery cable having a second housing (134) surrounding the first gas flow path (140) and a second gas flow path (144) through which a second gas flows and is isolated from the first gas by the first housing (132); and
  a removable housing (120) surrounding the multiple-gas delivery cable (136) and the control cable (26).

112. The system of claim 111 further comprising at least one of an auxiliary power cable (22) arranged with in the removable housing (120) and configured to conduct transmission-type power and gas delivery cable (136) is configured to receive one of a shielding gas and compressed air.

113. The system of claim 112 further comprising a grinder (54) configured to be driven by one of power delivered by the auxiliary power cable (22) and compressed air delivered by the gas delivery cable (136) to perform a grinding process.

114. The system of claim 111 wherein the welding-type power cable (20) connects a welding-type power source (12) configured to deliver welding-type power for a variety of welding-type processes to a wire feeder (36) to perform a welding-process and wherein the control cable (26) connects the wire feeder (36) to the welding-type power source (12) to control the welding-type power source (12) during the variety of welding-type processes.

115. The system of claim 114 further comprising a gouging power delivery cable arranged within the removable housing (120) and connecting the welding-type power source (12) to a gouging torch (51) to conduct gouging power to the gouging torch (51) during a gouging-type process.
116. The system of claim 115 wherein the wire feeder (36) includes a controller (37) configured to control the power source (12) to only deliver one of the welding-type power to the wire feeder (36) over the welding-type power delivery cable and the gouging power to the gouging torch (51) over the gouging power delivery cable at a time.

117. The system of claim 116 wherein the wire feeder (36) includes a user interface (84) configured to receive user-selected characteristics for the gouging power and the welding-type power and wherein the welding-type power source (12) is free of a user interface (84) configured to receive user-selected characteristics for the gouging power and the welding-type power.

118. The system of claim 117 wherein the controller (37) is configured to receive the user-selected characteristics for the gouging power and the welding-type power and control the welding-type power source (12) over the control cable (26) based on the user-selected characteristics.

119. A welding-type system (10) comprising:
    a control cable (26) having a non-conductive exterior housing (138, 142) surrounding a conductive interior (128, 130, 140, 144) configured to conduct control signals between a welding-type power source (12) and a remote control device;
    a welding-type power delivery cable having a non-conductive exterior housing (138, 142) surrounding a conductive interior (128, 130, 140, 144) configured to conduct welding-type power;
    a first gas delivery cable (136) having a first housing (132) surrounding a first gas flow path (140) through which a first gas flows;
    a second gas delivery cable having a second housing (134) surrounding a second gas flow path (144) through which a second gas flows;
    an auxiliary power cable (22) configured to conduct transmission-type power; and
a removable housing (120) surrounding the control cable (26),
the welding-type power delivery cable, the first gas delivery cable (136), the
second gas delivery cable, and the auxiliary power cable (22).

120. The system of claim 119 wherein the control cable (26) connects
a wire feeder (36) to a welding-type power source (12) to communicate
commands from the wire feeder (36) to the welding-type power source (12),
the welding-type power deliver cable connects the welding-type power source
(12) to the wire feeder (36) to deliver welding-type power having characteristics
indicated by the commands communicated by the wire feeder (36) to
effectuate one of a welding process and a gouging-type process, the first gas
delivery cable (136) delivers shielding gas to perform one of the welding
process and the gouging-type process, the second gas delivery cable delivers
compressed air to drive a pneumatic tool, and the auxiliary power cable (22)
delivers transmission-type power to drive a powered tool.