United States Patent [19]
Greco, Sr.

[11] 3,759,245
[45] Sept. 18, 1973

[54] HEATING TORCH

[76] Inventor: Phillip V. Greco, Sr., 1630 Maldon Ln., Dellwood, Mo. 63166

[22] Filed: Dec. 10, 1971

[21] Appl. No.: 206,693

[52] U.S. Cl. 126/406, 126/401, 431/354, 431/344
[51] Int. Cl. B44b 7/00, F23d 13/00
[58] Field of Search 431/158, 351, 352, 431/353, 354, 355; 126/405, 406, 403, 408, 401; 239/419.5, 432

[56] References Cited

UNITED STATES PATENTS

3,510,064	5/1970	Crook et al.	431/354
2,513,523	7/1950	Schäfer	239/419.5
1,215,153	2/1917	Hopkins	431/354
3,079,980	3/1963	Mihm	126/401
2,698,635	1/1955	Hollaway	126/401
2,326,630	8/1943	Fagan	126/401
887,743	5/1908	Storm, Jr.	126/401
658,591	9/1900	Schlegel	126/406

FOREIGN PATENTS OR APPLICATIONS

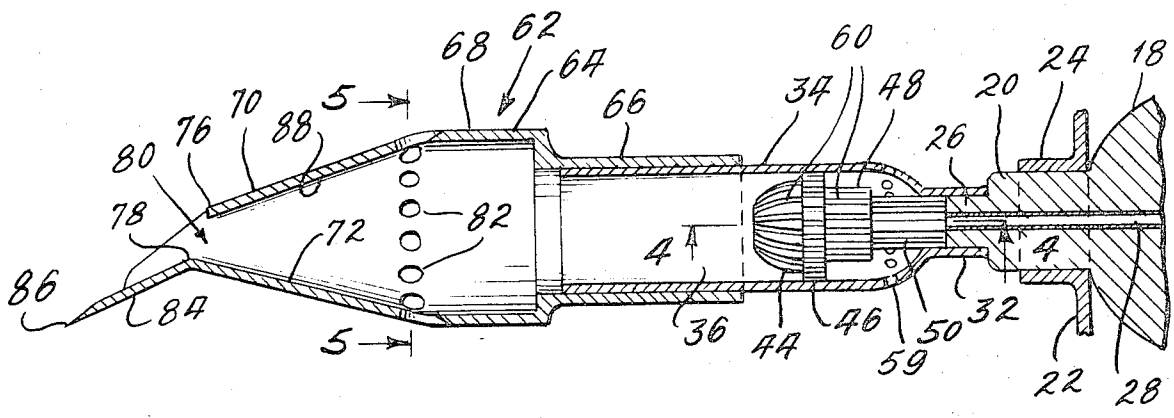
191,532	1/1923	Great Britain	126/406

Primary Examiner—William F. O'Dea
Assistant Examiner—Paul Devinsky
Attorney—Robert J. Schaap

[57] ABSTRACT

A portable heating torch for applying heat generated from a flame in a uniformly distributed pattern to a work surface in order to enable the performance of manual work such as cutting, scraping or the like on such work surface. The torch comprises a handle capable of being grasped by the hand of an operator and which is provided with a fuel delivery tube or other flexible fuel delivery means for connection to a suitable source of an ignitable fuel, and preferably a gaseous fuel such as propane or the like. A metal housing which forms an internal fuel receiving chamber is attached to and carried by the handle. The fuel employed is generally a gaseous fuel under pressure and is delivered to the fuel receiving chamber from the source through this tube or other flexible means and through a duct in the handle which is in fluid communication with the fuel delivery tube and the fuel receiving chamber. The fuel is injected into the fuel receiving chamber through an orifice therein and is mixed with air introduced into the fuel receiving chamber through a plurality of air intake apertures formed in the chamber wall. A heat application head is connected to the fuel receiving chamber and is in fluid communication therewith for receiving the fuel-air mixture and enabling a flame supported by combustion of the ignitable fuel-air mixture to be uniformly applied across a preselected area of the work surface. In a preferred embodiment of the invention, a work element such as a cutting member or a scraping member is mounted on and carried by the heat application head and is located in the path of the flame so that it is simultaneously heated along with the heat applied to the work surface, and in this way permits manual work to be performed by use of the work element on the heated work surface.

16 Claims, 6 Drawing Figures



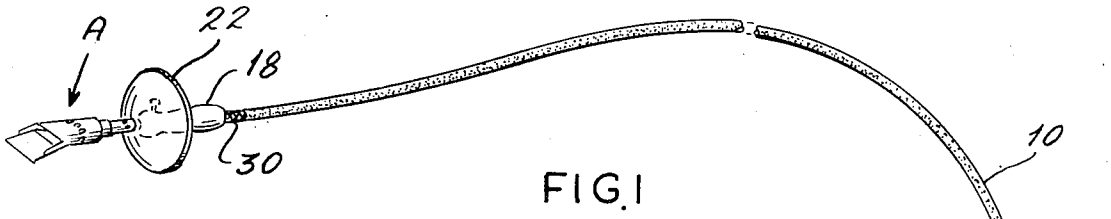


FIG. 1

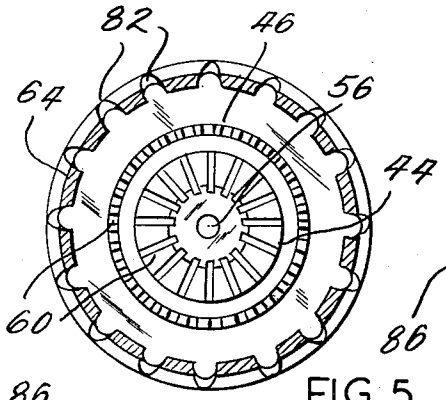


FIG. 5

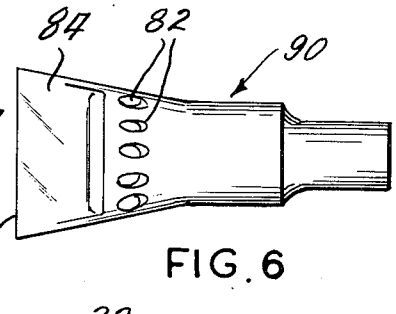
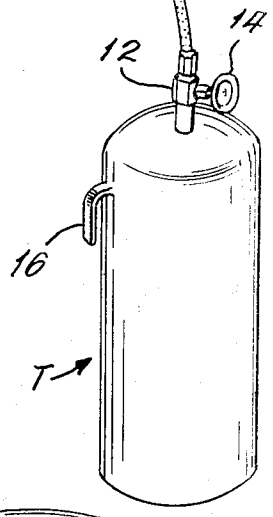


FIG. 6



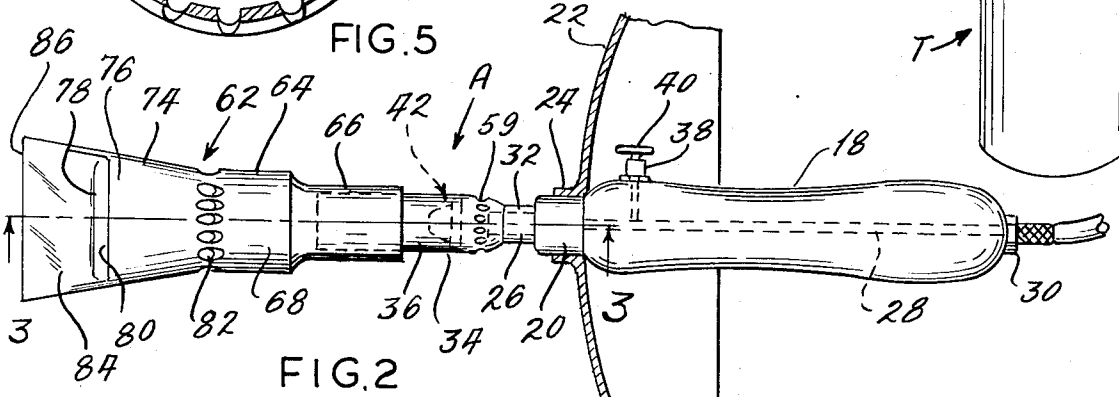


FIG. 2

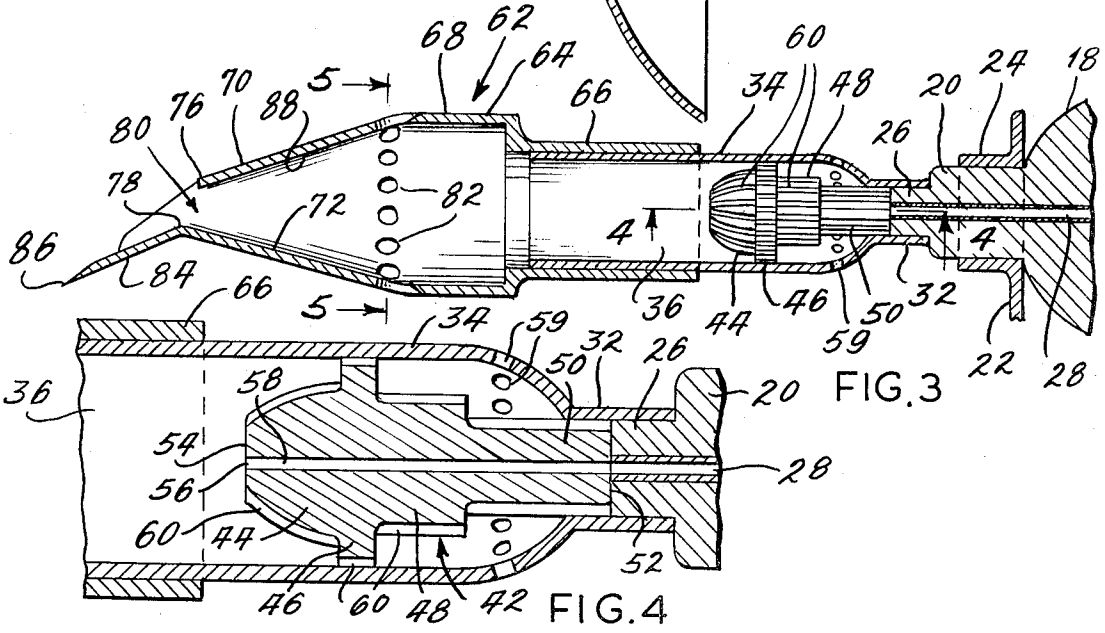


FIG. 3

FIG. 4

HEATING TORCH

This invention relates in general to certain new and useful improvements in heating torches, and more particularly, to heating torches which are capable of controllably applying large quantities of heat in an evenly distributed pattern to a work surface.

Today, many work operations which require manual effort, such as paint scraping, tile cutting, linoleum laying, and the like are usually performed in conjunction with the use of heat. In many cases, the operator generates the heat through the use of a gaseous ignitable fuel dispensed under pressure from a portable fuel tank containing propane or similar ignitable gas. These portable fuel tanks are commercially available and are usually provided with a valve for regulating the fuel flow and oftentimes are provided with an orifice for mixing air with the fuel discharged through the valve to obtain a combustible mixture. Many operators will also use a hand operated heating torch by applying heat to a work surface and where the torch is connected to and receives a fuel supply from a portable fuel tank or other source of ignitable fuel which may be carried on a movable cart or the like. Generally, these tanks of the stored ignitable gaseous fuel are connected through a flexible hose to the hand operated torch

In the performance of many work operations, the operator will place the flame producing head of the fuel tank or the torch in close proximity to the work surface for applying a flame to this work surface. Thereafter the operator may then perform the work on this surface which may require manual effort such as the laying of a surface covering material or surface coating, or it may involve the use of a hand operated tool to perform the work such as cutting or scraping or the like.

In the laying of linoleum or other relatively durable surface covering, an adhesive is usually applied to the underside of the sheet of linoleum or other covering and/or to the floor or other surface to which the covering material is to be secured. Heat is thereafter applied to the covering material or to the adhesive or both in order to cure the adhesive and achieve a relatively permanent bond between the covering material and the receiving surface. In may cases, heat is also used in the cutting and applying of many surface coverings, such as tile, to a support surface or other substrate. The operator must use extreme care in applying the heat in order to prevent overcuring of the resin and even more importantly, to prevent a burning or scarring of the exposed surface of the covering material. The operator will generally move the torch or other flame producing device in a relatively continuous pattern in order to prevent a burning or scarring of the surface covering material or the work surface.

One of the most common operations where heat is applied to a work surface lies in the removing of paint, varnish, or other surface coatings typically from wood surfaces and other substrates. In this case, the operator normally heats the surface coating on the substrate until he observes the formation of bubbles in the surface coating. A paint scraper or similar hand operated tool is then used to scrape the coating from the substrated surface. However, if the scraping operation is not conducted immediately after the heating and the coating is allowed sufficient time to cool and reharden, the scraping task will become much more difficult.

Again, the operator must use extreme care in order to prevent a burning of the substrate surface.

The heat which is generated from a fuel tank fitted with a flame head or the heat generated by these conventional hand operated torches is usually produced by a flame supported on combustion of a gaseous fuel emitted from a nozzle. Consequently, the generated heat is normally highly concentrated and therefore these devices do not readily lend themselves for use in producing heat for even and uniform distribution and application over the work surface. Consequently, the operator must continually move the mechanism used to generate the heat in a uniform pattern over the work surface in order to prevent localized heating and ultimate burning of the substrate. After the paint or other coating has been heated sufficiently, the operator may then use a hand scraper for removing the paint. In each of these operations, generally both hands are required in order to apply the heat to the work surface and thereafter immediately perform the manual work on the work surface. Application of heat to a work surface controlled by one hand and almost simultaneous operation of a work tool with the other hand is rather hazardous to the operator and the operator must use extreme care in order to prevent injuries to himself such as by the burning of his hands. Furthermore, since there is no means provided for proper metering of the gas or other fuel, there is a considerable waste of the limited quantity of fuel which is available in a portable tank.

It is therefore, the primary object of the present invention to provide a heating torch which is capable of providing a uniformly distributed source of heat to be applied to a work surface for the performance of other manual work thereon.

It is another object of the present invention to provide a heating torch of the type stated which is highly efficient in its operation and minimizes the amount of fuel required in order to apply a desired amount of heat to a work surface.

It is a further object of the present invention to provide a heating torch of the type stated which operates in conjunction with a work tool such as a scraper, knife or the like thereby lending to operator manual dexterity and increased labor efficiency.

It is an additional object of the present invention to provide a heating torch of the type stated which is highly compact, light in weight for portability and relatively safe to operate.

It is also an object of the present invention to provide a heating torch of the type stated which includes a work tool mounted thereon in a location to be heated simultaneously with the heat applied to the work surface.

It is yet another object of the present invention to provide a heating torch of the type stated which is capable of being used with any of a large number of stored sources of ignitable fuel and which is capable of being operated with a wide variety of different fuels.

It is another salient object of the present invention to provide a method of performing work with a hand operated work tool on a work surface by simultaneously heating a work element on the tool and a work surface, and thereafter engaging the surface with the work element on the tool for performing manual work thereon.

With the above and other objects in view, my invention resides in the novel features of form, construction, arrangement and combination of parts, presently described and pointed out in the claims.

In the accompanying drawing (one sheet):

FIG. 1 is a perspective view of a heating torch constructed in accordance with and embodying the present invention and showing its operative connection to a fuel tank through a flexible fuel delivery tube;

FIG. 2 is a top plan view, partially broken away and in section, and showing the heating torch forming part of the present invention;

FIG. 3 is a vertical fragmentary sectional view taken along line 3—3 of FIG. 2, and showing the internal construction of a portion of the heating torch of the present invention;

FIG. 4 is an enlarged horizontal sectional view taken along line 4–4 of FIG. 3 and showing the internal construction of the fuel mixing chamber forming part of the heating torch of the present invention;

FIG. 5 is a vertical sectional view taken along line 5—5 of FIG. 3; and

FIG. 6 is a top plan view of a modified form of heat application head which is used with the heating torch of the present invention.

Generally speaking, the present invention relates to a heating torch comprising a handle forming member of the type which is capable of being grasped and manually manipulated by an operator. A flexible delivery tube or other fuel delivery means is removably connected to the handle forming member and is in fluid communication with a central bore formed in and extending through the handle forming member. The other end of this flexible tube or such other fuel delivery means is removably connected to a source of ignitable fuel such as portable fuel tank containing propane or a similar gas.

A metal housing is carried by the handle forming means and forms a fuel receiving chamber which is in fluid communication with the central bore in the handle forming means. The fuel which is introduced into the central bore of the handle forming member through the flexible fuel delivery conduit is also introduced under pressure into the fuel receiving chamber through a fixed orifice which is located in a diametrally reduced neck portion at the rearward end of the metal housing. This neck portion is attached to the hangle forming means so that the fixed orifice member is located at the forward end of the bore and extends into the fuel receiving chamber for introducing the fuel into the chamber at a relatively high flow rate thereby creating a venturi effect in this chamber. Air is also introduced into the fuel receiving chamber through a plurality of air intake apertures disposed around the wall of the metal housing and this air is admixed with the fuel in order to provide a combustible air-fuel mixture.

The air-fuel mixture is then introduced into a heat application head or so-called flame producing head under pressure where it is capable of being ignited. Additional air intake apertures are located on the flame producing head for mixing additional amount of air with the air-fuel mixture received from the fuel chamber. A manually operated valve, such as a needle valve may be located in the central bore of the handle forming means or in the fuel receiving chamber for regulating the amount of fuel to be introduced into the fuel receivng chamber and hence for regulating the size of the flame which is supported by the combustion of the fuel. The flame supported by the combustion of this fuel is discharged through an elongated aperture or other form of flame emitting orifice means in a relatively uniformly distributed pattern so that the heat resulting from this flame may be uniformly applied to a preselected area of the work surface.

In a preferred embodiment of the invention, a work element, such as a cutting blade, a scraping blade, or the like may be integrally formed with, or welded or otherwise rigidly attached to and carried by the flame producing head. The work element is secured to the flame producing head in a position where it is located in the path of the flame which passes through the flame emitting orifice means. In this manner, the work surface and the work element are both simultaneously heated for the ultimate performance of work on the heated work surface.

Referring now in more detail and by reference characters to the drawings which illustrate preferred embodiments of the present invention, A designates a heating torch which is operatively connected to a portable fuel tank T by means of a flexible fuel delivery tube or other fuel delivery member 10. The tank T is of the type which contains an ignitable fuel and preferably a gaseous fuel under pressure such as propane. The fuel tank T would normally be provided with a valve 12 controlled by a knurled knob 14 or other control member manually actuable by an operator in order to regulate the fuel discharge from the Tank T. Furthermore, the fuel tank T is usually provided with a check valve or similar safety mechanism (not shown) to automatically prevent fuel flow upon disconnection of the fuel delivery tube 10 from the tank.

An L-shaped hook 16 may be welded to or otherwise rigidly secured to the side wall of the tank enabling removable attachment of the tank to the belt of an operator lending to portability of the fuel tank and also to permit the use of a relatively short fuel delivery tube 10. Other forms of attachment means could also be provided on the tank T in order to permit convenient transportability by the operator. It should also be understood that other fuel sources could also be used with the heating torch A of the present invention. For example, relatively large fuel tanks carried on moveable carts or the like could also be used in connection with this heating torch. It is also contemplated that the torch could be rigidly secured to the discharge valve of the fuel tank and carried with the tank as a unitary member. The subject heating torch is capable of providing a flame supported on combustion of any of a number of commercially available fuels in addition to propane, such as acetylene ethylene, butane and the like. In addition, the present invention contemplates the connection of the heating torch A to two or more sources of fuel such as oxygen and acetylene in order to support combustion with an oxy-acetylene mixture.

The flexible fuel delivery tube T is preferably made of a neoprene rubber or similar material and the tube T will be constructed with a length which is sufficient to permit the necessary relatively unrestricted movement of the heating torch by the operator. The fuel delivery tube 10 should preferably be formed of a material which is chemically inert to the gas or gases which may be delivered to the heating torch A.

The heating torch A generally comprises a handle 18 illustrated as being somewhat cylindrical in nature and which is contoured so that it may be conveniently grasped by one hand of an operator and easily manipulated thereby. The handle 18 is preferably made of a wooden material or a plastic material such as polysty-

rene, any of a number of the vinyl plastics, or the like, though other materials of construction including several metals could be used as well. The exact shape of the handle is not critical, and the handle could be constructed in the form of a "pistol grip" handle or any other shape which is capable of being conveniently grasped and easily handled by an operator. The handle 18 is provided at its forward end with an integrally formed diametrally reduced boss 20 for supporting a somewhat arcuately shaped protective shield 22 which is preferably formed of a metal such as steel or the like. The shield 22 is also provided with an integrally formed circular sleeve 24 which is concentrically disposed over and snuggly engages the boss 20 for retentively holding the shield 22 thereon, though other forms of attaching the shield 22 to the handle 18 could be employed. Any of a number of fasteners such as screws or the like could also be used to retentively secure the shield 22 to the handle 18.

At its forward end, the boss 20 integrally merges into a forwardly extending diametrally reduced mounting hub 26 for reasons which will presently more fully appear. The handle 18 including the boss 20 and the hub 26 are provided with a central elongated fuel receiving bore 28 extending axially therethrough and at its rearward end, reference being made to FIG. 2, the handle 18 is provided with a fitting 30 for disengagable connection to the flexible fuel carrying tube 10. A safety device such as a heat responsive check valve or the like may be located within the fuel receiving bore 28 of the handle 18, or in any other part of the torch A to stop fuel flow upon extinguishment of the flame. Other forms of safety devices such as a trigger mechanism on the handle actuating a valve member in the fuel receiving bore 28 could also be employed and would operate in a manner to prevent fuel flow until the trigger mechanism is actuated.

Disposed over and retentively held on the mounting hub 26 of the handle 18 is the diametrally reduced neck portion 32 of a cylindrical housing 34 which forms a fuel receiving chamber 36. The housing 34 is preferably formed of a metal such as steel, various alloys thereof, or other metals which are capable of withstanding substantial amounts of heat without loosing their structural integrity. The diametrally reduced neck portion 32 snuggly engages the mounting hub 26 on the handle 18 and in this manner the handle 18 is securely, though nevertheless removably, attached to the cylindrical housing 34. Thus, the handle 18 and the housing 34 can be rapidly disconnected from each other lending to convenient interchangability of these parts of the torch A. Small set screws extending through the neck portion 32 into the hub 26, or other fastening means (not shown) could also be used to secure the metal housing 34 to the handle 18. The present invention also contemplates the use of a metal retaining sleeve located in the portion of the bore 28 which is formed in the boss 20 or the hub 26 for snuggly receiving the reduced neck portion 32 as a means of retentively securing the housing 34 to the handle 18.

The amount of fuel which is introduced into the fuel receiving chamber 36 may be regulated by a needle valve 38 or other form of valve means which is conveniently located on the handle 18 or elsewhere on the torch A for easy manipulation by an operator. The needle valve 38 is conveniently provided with a valve stem operatively engagable in a valve seat arrangement (not shown) located within the fuel receiving bore 28 and which valve stem is shiftable to control fluid flow through the fuel receiving bore 28 by means of a mechanism including a knurled knob 40 located on the exterior of the handle 18. Thus, the fuel flow can be conveniently and carefully regulated by the operator even during the use of the torch. By merely rotating the knurled knob 40, in the desired direction with the thumb and the index finger of the one hand which is grasping the handle 18, the operator can regulate the fuel flow and achieve the desired flame size. In this way, the operator can adjust the size of the flame and therefore regulate the amount of heat applied to the work surface without the necessity of removing the source of heat from the work surface to accomplish this adjustment.

Internally disposed within the chamber 36 is a mixing plug 42 which is provided with a head 44 having an integrally formed radially enlarged circumferentially extending retaining flange 46 which is sized to snuggly engage the interior surface of the chamber wall 34 for rigidly holding the plug 42 in place. The head 44 is also integrally provided with a diametrally reduced neck 48 which integrally merges into a further diametrally reduced shank 50 in the manner as illustrated in FIG. 4. The shank 50 is provided with a relatively flat rearwardly presented face 52 disposed in facewise mating engagement with a matching relatively flat forwardly presented face on the hub 26 of the handle 18. The head 44 is also provided with a relatively flat forwardly presented face 54 having a fuel emitting orifice 56 which communicates with a central axially extending fuel delivery duct 58 formed in the plug 42. The fuel delivery duct 58 is axially aligned with and located in fluid communication with the fuel receiving bore 28 formed in the handle 18 for delivering the fuel into the chamber 36. The plug 42 is preferably formed of a metal such as steel, copper or the like and is largely a solid member except for the orifice 56 and the fuel delivery duct 58.

As the fuel is introduced into the fuel receiving chamber 36 through the duct 58 and the orifice 56 under pressure, it creates a venturi effect in the chamber 36 and will cause a flow of air into the chamber 36 through a plurality of circumferentially spaced air intake apertures 59 formed in the chamber wall 34 and spaced rearwardly of the plug 42. The air is urged through a plurality of axially extending grooves 60 formed around the entire exterior surface of the plug 42 and mixed with the fuel in the region of the chamber 36 located forwardly of the plug 42. These grooves 60 are located on the head 44, the flange 46, the diametrally reduced neck 48 and the shank 50 so air can flow around the entire surface of the plug 42, thereby creating a finely distributed air flow for complete and thorough mixing with the fuel which is introduced into the chamber 36 through the orifice 56. The size of the apertures 59 and their respective locations and spacing on the chamber wall 34 will vary depending upon the amount and the type of air flow which is desired. However, it has been found that a more effective air-fuel mixture for more efficient combustion is achieved when the apertures 59 are located at least rearwardly of the diametrally reduced neck portion 48.

The length of the metal housing 34 is sufficiently long so that the fuel receiving chamber 36 has a length which is sufficient to permit proper mixing of the air

and fuel. The length of this chamber 36 and for that matter, the positioning of the plug 42 and the location of the apertures 59 may vary depending upon the type of fuel which is to be used and the amount of heat which is to be generated with the torch A.

A flame producing head 62 having a somewhat enlarged cylindrical housing 64 and an integrally formed rearwardly extending elongated sleeve 66 is attached to and carried by the housing 34. The sleeve 66 is sized to be concentrically disposed over the chamber wall 34 in removable, but nevertheless tight fitting engagement therewith. The somewhat enlarged housing 64 which forms an ignition chamber 68 is disposed in fluid communication with the fuel receiving chamber 36 in the manner as illustrated in FIGS. 2 and 3. The flame producing head 62 is also integrally provided with a pair of forwardly extending upper and lower converging walls 70 and 72 respectively connected by somewhat arcuately shaped side walls 74. The converging walls 70 and 72 are also provided with relatively flat transversely extending terminal margins 76 and 78 which are vertically spaced from each other to form an elongated transversely extending flame emitting orifice 80.

A series of circumferentially spaced air holes 82 are formed in and spaced around the metal housing 64 at the point of integral connection of the upper and lower converging walls 70 and 72 and the arcuately shaped side walls 74. These air holes 82 are properly sized for introducing additional air into the ignition chamber 68 and for mixing with the air-fuel mixture received from the chamber 36. The exact location of these air holes 82 may vary depending upon the type of application, though it has been found that the most effective results are obtained when the air holes 82 are located in the position as illustrated in FIGS. 2 and 3. The flame producing head 62 is also formed of a metal which is capable of withstanding a substantial amount of heat without losing its structural integrity and may be constructed of any of the metals used in the construction of the metal housing 34.

Integrally formed with and extending downwardly and outwardly from the lower wall 72 at the terminal margin 78 is a work element such as a blade 84 which may terminate in a relatively sharp edge 86 to serve the purposes of cutting, scraping, or the like. It can be observed by reference to FIG. 3, that the work element 84 is provided with an upwardly presented flame directing surface and extends downwardly at approximately the same angular direction as the upper wall 70, and in this manner, the interior surface 88 of the upper wall 70 serves as a deflection surface for deflecting at least a portion of the flame over the flame directing surface on the work element 84. The flame will be emitted from the orifice 80 in somewhat of a forward and also downwardly pointed direction due at least in part to the action of the deflection surface 88. A portion of this flame will be directed and applied to a work surface in a uniformly distributed pattern and in addition, a portion of the flame will pass over the work element 84 in direct contact therewith for heating this work element.

The exact form assumed by the work element 84 will also vary depending upon the application and the intended use of the heating torch A. Since the flame producing head 62 is removably attachable to the housing 34 by merely slipping the sleeve 66 over the exterior surface of the housing 34 it can be easily and conveniently attached to and removed from the torch A. In this connection, a number of flame producing heads may be provided, each having different forms of work elements 84. For example, one flame producing head 62 may be provided with a scraping element, another may be provided with a cutting blade and others may be provided with different forms of work elements. In many cases, it may only be desirable to apply heat to a work surface, without the need of a work element on the torch and in this case, the work element would not be included on the flame producing head.

FIG. 6 illustrates a modified form of flame producing head 90 which is substantially similar in many respects to the flame producing head 62 except that the flame producing head 90 is provided with a longer ignition chamber. Further, the air intake apertures 82 are located in close proximity and spaced immediately rearwardly of the flame emitting orifice 80. This latter form of flame producing head is preferred in many applications, and has also been found to be highly effective.

In use, the heating torch A is connected to the source of fuel, such as the tank T by means of the fuel delivery tube 10. The operator will regulate the amount of fuel which is desired through actuation of the knurled knob 14 on the tank T with fine adjustment being made through rotation of the knurled knob 40 on the handle 18. Either one or both of these adjustments will permit the desired amount of fuel to flow through the fuel receiving bore 28 and through the fuel delivery duct 58 and orifice 56 into the fuel receiving chamber 36. The fuel which is introduced into the chamber 36 is preferably in a gaseous state and while some fuel in the liquid state may be carried with the gas, this liquid fuel is highly atomized since it is introduced into the fuel receiving chamber 36 through a relatively small diameter orifice under high pressure. As the fuel is introduced into the chamber 36, the venturi effect created therein will cause a movement of air through the air-intake apertures 58 over the plug 42 and into the interior of the chamber 36 where the air is thoroughly mixed with the fuel. This air-fuel mixture is then urged into the ignition chamber 68 where it may be mixed with additional air introduced therein through the air intake apertures 82.

This air-fuel mixture in the ignition chamber 68 is constantly urged outwardly under pressure through the flame emitting orifice 80 when the valves controlled by the knurled knobs 14 and 40 are opened. By generating a spark near the flame emitting orifice the air-fuel mixture will be ignited generating a uniformly distributed flame size across the orifice 80. Further adjustment of the knurled knob 40 will permit the operator to obtain the desired flame size for the intended work application. The flame which is generated will be applied to the work surface and at least a portion of this flame will pass directly over the work element 84 thereby heating this element 84. Consequently, the work element 84 which is located in the path of the flame and also in close proximity to the heated work surface is easily manipulated to perform work on this work surface.

Thus, there has been illustrated and described a novel heating torch which is capable of controllably applying large quantities of heat in an evenly distributed pattern to a work surface and which fulfills all of the objects and advantages sought therefore. Many changes, modifications, variations, and other uses and applications of the subject heating torch will become apparent to those skilled in the art after considering this specification and accompanying drawing. All such

changes, modifications, variations and other uses and applications which do not depart from the spirit and scope of the invention are deemed to be covered by the invention which is limited only by the following claims.

Having thus described my invention, what I desire to claim and secure by Letters Patent is:

1. A portable heating torch for providing a uniformly distributed heat to a work surface, said torch comprising handle forming means, fuel receiving means operatively associated with said handle forming means and including a fitting on said handle forming means, flexible conduit means for operative connection to said fitting and to a source of gaseous ignitable fuel under pressure to deliver fuel in said source to said fuel receiving means, a metal housing operatively connected to said fuel receiving means for receiving the ignitable fuel from said fuel receiving means, a mixing plug disposed within said metal housing forming a fuel mixing chamber downstream of said plug in the direction of movement of said ignitable fuel, duct means formed in said mixing plug and terminating in an orifice communicating with the mixing chamber for introducing the gaseous fuel therein under pressure to cause a venturi effect across said mixing plug, means forming a plurality of primary air intake apertures circumferentially disposed about said metal housing and being located upstream of said mixing plug for introducing air into said housing, groove means formed on said plug for enabling the introduced air to be urged through said groove means into said mixing chamber by said venturi effect and for mixing the air with said fuel, heat application means operatively associated with said metal housing and having an ignition chamber therein for receiving the fuel-air mixture under pressure from said fuel mixing chamber, means forming a plurality of spaced secondary air intake apertures on said heat application means to introduce additional air into said ignition chamber for mixing with the fuel-air mixture introduced in said ignition chamber, a flame emitting orifice formed in said heat application means to permit exit of the mixture in said heat application means and a flame supported by the ignitable fuel containing mixture, an extended member on said heat application means and having a flame directing surface thereon, and said heat application means having a deflection surface to direct a flame supported by said ignitable fuel uniformly across a preselected area of said flame directing surface and outwardly from said torch.

2. The portable heating torch of claim 1 further characterized in that a work member forms part of the extended member operatively mounted on said heat application means for engaging the work surface and performing work on said work surface through manual actuation of said handle forming means.

3. The portable heating torch of claim 1 further characterized in that a work member forms part of the extended member operatively mounted on said heat application means for engaging the work surface and performing work on said work surface through manual actuation of said handle forming means and that said work member is located to also receive the heat from said heat application means.

4. The portable heating torch of claim 1 further characterized in that the flame emitting orifice in said heat application means is a relatively thin elongated orifice permitting the application of a relatively thin elongated flame to said work surface.

5. The portable heating torch of claim 1 further characterized in that the flame emitting orifice in said heat application means is a relatively thin elongated orifice permitting the application of a relatively thin elongated flame to said work surface, and that said deflection surface is located to direct said flame in a proper direction across said flame directing surface and toward said work surface.

6. The portable heating torch of claim 2 further characterized in that said work member is a cutting member having an edge capable of cutting through a work surface.

7. The portable heating torch of claim 2 further characterized in that said work member is a scraping member having an elongated edge capable of scraping a coating off of a work surface.

8. A hand operable portable heating torch for providing a uniformly distributed heat to a work surface, said torch comprising:

a. handle forming means,
b. fuel receiving means operatively associated with said handle forming means,
c. said fuel receiving means including a fitting on said handle forming means,
d. flexible conduit means for operative connection to said fitting and to a source of gaseous ignitable fuel under pressure to deliver fuel in said source to said fuel receiving means,
e. a metal housing operatively connected to said fuel receiving means for receiving the ignitable fuel from said fuel receiving means,
f. a mixing plug disposed within said metal housing,
g. said metal housing forming a fuel mixing chamber downstream of said plug in the direction of movement of said ignitable fuel,
h. said fuel mixing plug comprising:
   1. a cylindrical member fitted with said metal housing and snugly engaging an interior wall of said metal housing,
   2. a head member on said cylindrical member and extending forwardly thereof in the direction of movement of the fuel,
   3. said head member being diametrically reduced with respect to said cylindrical member so as to be spaced from the interior wall of said metal housing,
   4. a rearwardly extending member on said opposite side of said cylindrical member with respect to head member,
   5. said rearwardly extending member also being diametrically reduced with respect to said cylindrical member so as to also be spaced from the interior wall of said metal housing,
   6. at least said cylindrical member and said head member having groove means extending axially therealong,
   7. an axially extending duct formed in said mixing plug,
   8. said axially extending duct terminating in an orifice communicating with the mixing chamber for introducing the gaseous fuel therein under pressure to cause a venturi effect across said mixing plug,
i. means forming a plurality of primary air intake apertures circumferentially disposed about said metal housing and being located upstream of said mixing plug for introducing air into said housing,

j. said groove means formed on said plug for enabling the introduced air to be urged through said groove means into said mixing chamber by said venturi effect and for mixing the air with said fuel,

k. heat application means operatively associated with said metal housing and having an ignition chamber therein for receiving the fuel-air mixture under pressure from said fuel mixing chamber,

l. means forming a plurality of spaced secondary air intake apertures on said heat application means to introduce additional air into said ignition chamber for mixing with the fuel-air mixture introduced in said ignition chamber,

m. means forming a flame emitting orifice in said heat application means to permit exit of the mixture in said head application means and a flame supported by the ignitable fuel containing mixture,

n. an extended member on said heat application means,

o. said extended member having a flame directing surface thereon,

p. and said heat application means having a deflection surface to direct a flame supported by said ignitable fuel uniformly across a preselected area of said flame directing surface and outwardly from said torch.

9. The hand operable heating torch of claim 8 further characterized in that a work element is formed on said extending member and said work element has a relatively sharp edge capable of engaging and penetrating at least a portion of the work surface.

10. The hand operable heating torch of claim 8 further characterized in that a work element is formed on said extending member and said work element has a relatively sharp edge capable of engaging and cutting at least a portion of the work surface.

11. The hand operable heating torch of claim 8 further characterized in that a work element is formed on said extended member and has a relatively sharp edge capable of engaging and scraping at least a portion of the work surface.

12. The hand operable heating torch of claim 8 further characterized in that valve means is operatively associated with said fuel receiving means to regulate the amount of fuel introduced into said fuel mixing chamber.

13. The hand operable heating torch of claim 8 further characterized in that the flame emitting orifice in said heat application means is a relatively thin elongated orifice permitting the application of a relatively thin elongated flame to said work surface.

14. The hand operable heating torch of claim 8 further characterized in that the flame emitting orifice in said heat application means is a relatively thin elongated orifice permitting the application of a relatively thin elongated flame to said work surface, and that said deflection surface is located to direct said flame in a proper direction across said flame directing surface and toward said work surface.

15. A portable heating torch for providing a uniformly distributed heat to a work surface and being operable upon manual application of force to apply work to said work surface; said torch comprising:

a. handle forming means,

b. a fuel receiving duct operatively formed in said handle forming means,

c. a fitting on said handle forming means and communicating with said fuel receiving duct,

d. a flexible conduit for operative connection to said fitting and to a source of gaseous ignitable fuel under pressure to deliver fuel in said source to said fuel receiving duct,

e. a metal housing operatively connected to said handle forming means and communicating with the fuel receiving duct for receiving the ignitable fuel from said fuel receiving duct,

f. a mixing plug disposed within said metal housing forming a fuel mixing chamber downstream of said plug in the direction of movement of said ignitable fuel,

g. said fuel mixing plug comprising:

1. a cylindrical member fitted within said metal housing and snuggly engaging an interior wall of said metal housing,

2. a head member on said cylindrical member and extending forwardly thereof in the direction of movement of the fuel,

3. said head member being diametrically reduced with respect to said cylindrical member so as to be spaced from the interior wall of said metal housing,

4. a rearwardly extending member on said the opposite side of said cylindrical member with respect to head member,

5. said rearwardly extending member also being diametrically reduced with respect to said cylindrical member so as to also be spaced from the interior wall of said metal housing,

6. said cylindrical member, said head member and said rearwardly extending member having a plurality of circumferentially spaced axially extending grooves,

7. an axially extending duct formed in said mixing plug,

8. said axially extending duct terminating in an orifice communicating with the mixing chamber for introducing the gaseous fuel therein under pressure to cause a venturi effect across said mixing plug,

h. means forming a plurality of primary air intake apertures circumferentially disposed about said metal housing and being located upstream of said mixing plug for introducing air into said housing,

i. said axially extending grooves formed on said plug enabling the introduced air to be urged through said grooves into said mixing chamber by said venturi effect for mixing the air with said fuel,

j. a flame application head operatively attached to said metal housing,

k. said flame producing head having an outer wall forming housing and having an ignition chamber therein for receiving the fuel-air mixture under pressure from said fuel mixing chamber,

l. means forming a plurality of spaced secondary air intake apertures on said wall forming housing to introduce additional air into said ignition chamber for mixing with the fuel-air mixture introduced in said ignition chamber,

m. means forming a relatively thin elongated flame emitting orifice in said outer wall forming housing to permit exit of the mixture in said ignition chamber and a flame supported by the ignitable fuel containing mixture,

n. a downwardly and outwardly directed extended member on said outer wall forming housing,

o. said extended member having an upwardly presented flame directing surface thereon,

p. said wall forming housing having an interior deflection surface to direct a flame supported by said ignitable fuel uniformly across a preselected area of said flame directing surface and outwardly from said torch toward said work surface,

q. and a work element formed on the outer end of said extended member and having a relatively sharp edge capable of engaging and cutting into at least a portion of the work surface.

16. The portable heating torch of claim 15 further characterized in that a manually operable valve is operatively mounted on said handle forming means to control the flow of fuel through said fuel receiving duct.

* * * * *