United States Patent [19]

Aske

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[54] **MINIATURE BLOWTORCH**

[76] Inventor: **Leonard E. Aske,** 5508 Park Ave., Minneapolis, Minn. 55417

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[52] **U.S. Cl.** **431/344;** 431/350; 431/354; 431/154; 222/5

[51] **Int. Cl.**[2] **F23D 13/04;** F23D 13/24

[58] **Field of Search** 431/344, 350, 352, 354, 431/255, 346, 154; 126/236, 237, 229, 413, 414; 222/5

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Primary Examiner—Carroll B. Dority, Jr.
Attorney, Agent, or Firm—Merchant, Gould, Smith & Edell

[57] **ABSTRACT**

An improved burner assembly for attachment to a miniature blowtorch which utilizes compressed gas as a fuel and air as an oxidizer, and which includes a valve for selectively controlling the air flow. A gas diffuser plate is used along with a windshield to produce a more resilient flame. The improved burner assembly utilizes a filter in close proximity to a flow control orifice for metering the flow of fuel. A snap-on bracket secures a fuel cylinder to the blowtorch and a removable solder tip can be used to convert the blowtorch to a soldering iron. The burner assembly can be used with a T-shaped manifold to provide a wide flame front. An adaptor sleeve is provided for adapting the improved burner for use on existing miniature blowtorches having a single-orifice nozzle.

4 Claims, 12 Drawing Figures

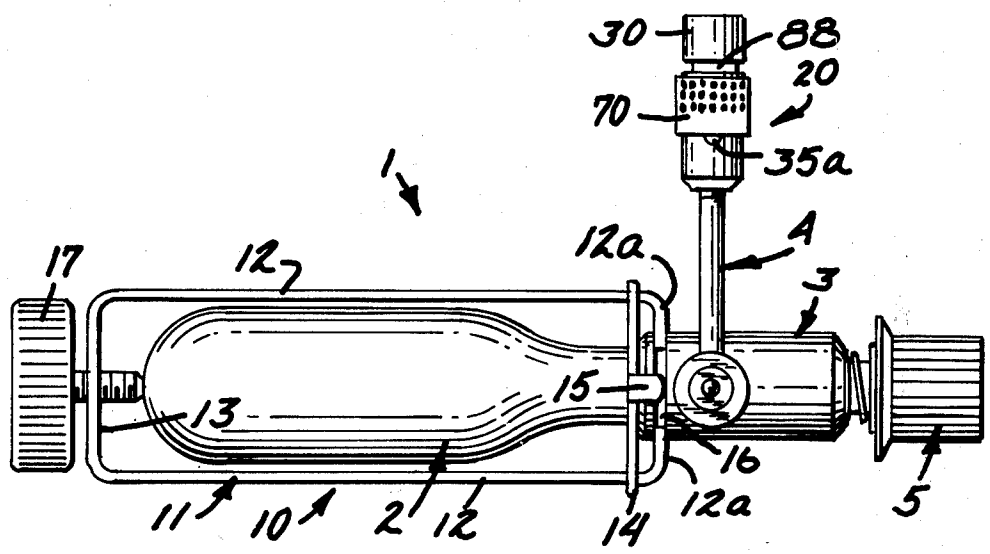


FIG. 1

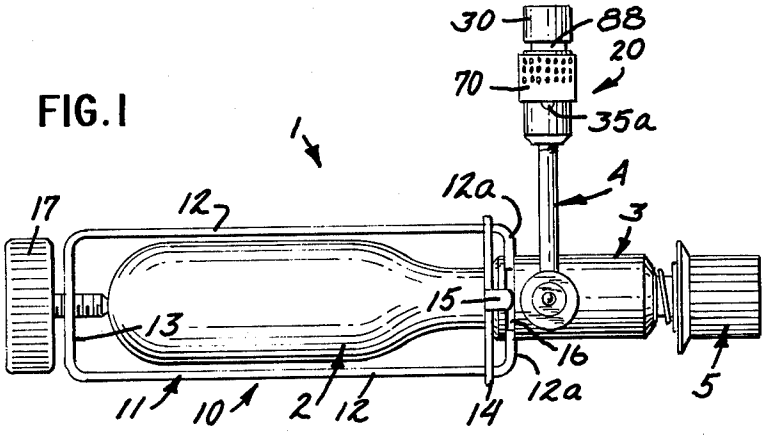
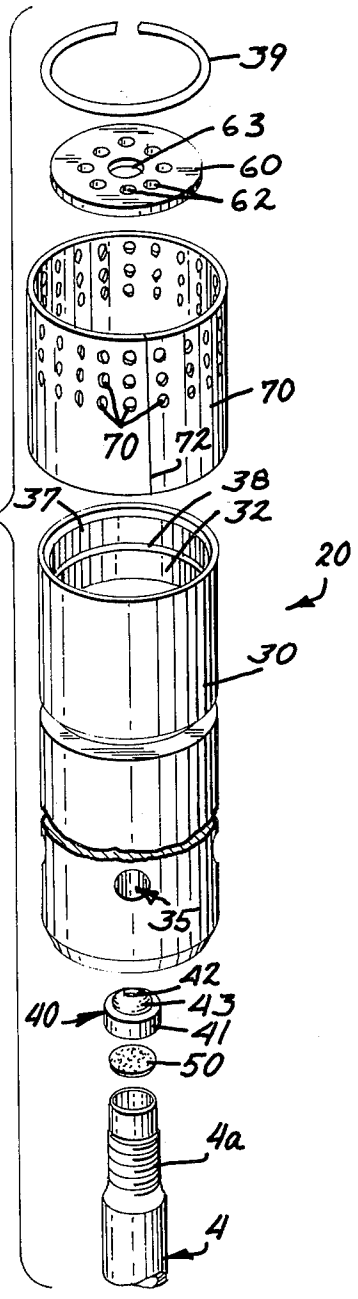


FIG. 3



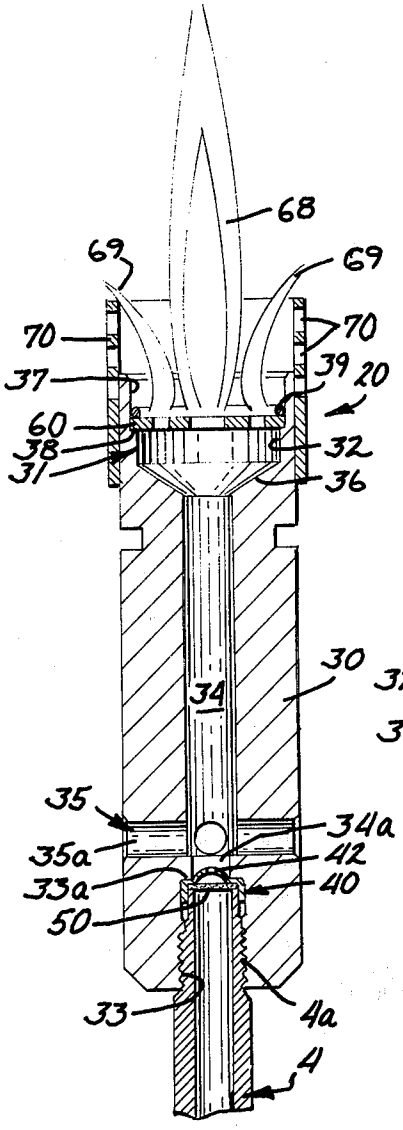
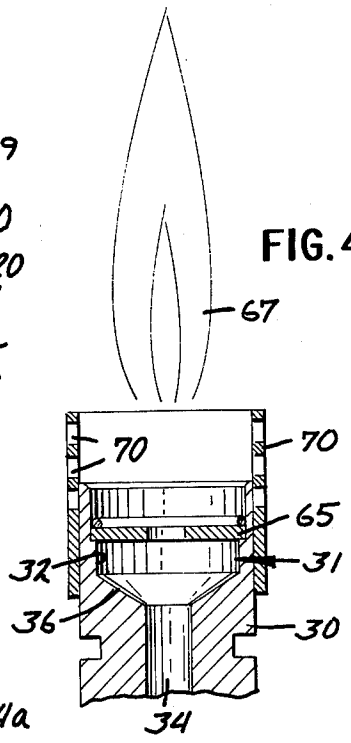


FIG. 2

FIG. 4



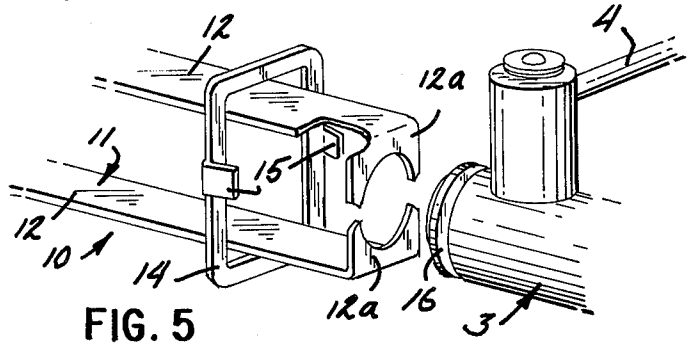


FIG. 5

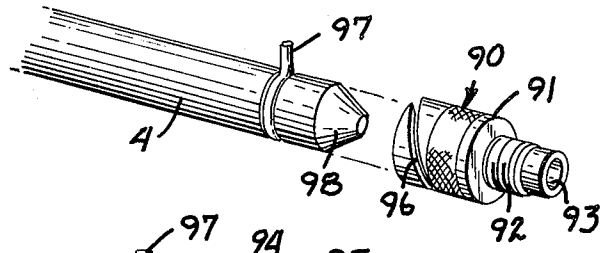


FIG.6

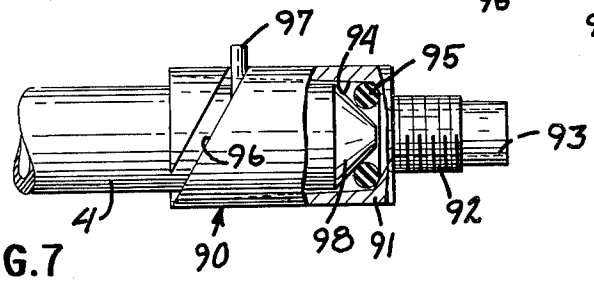


FIG.7

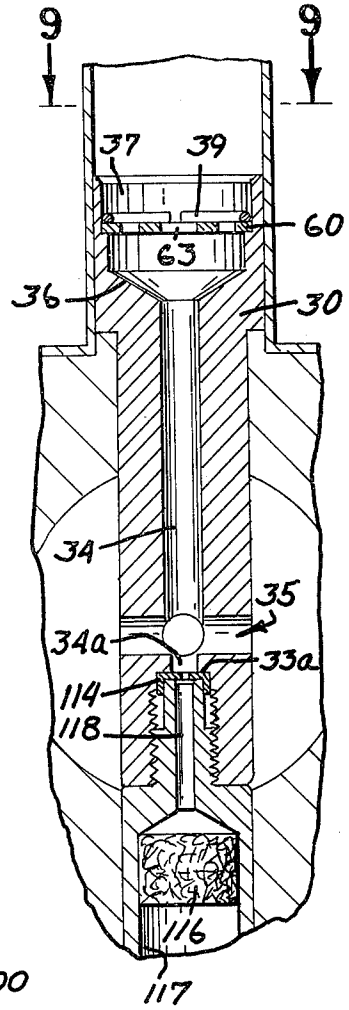
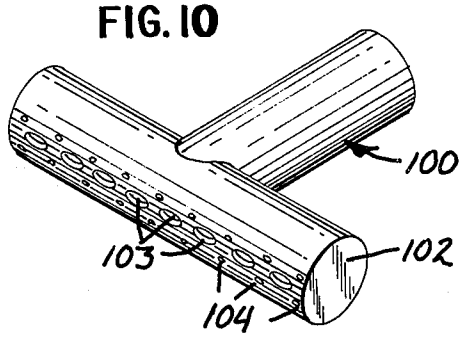


FIG.8

FIG. 10



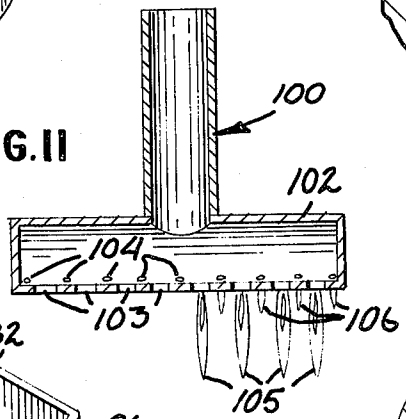


FIG.11

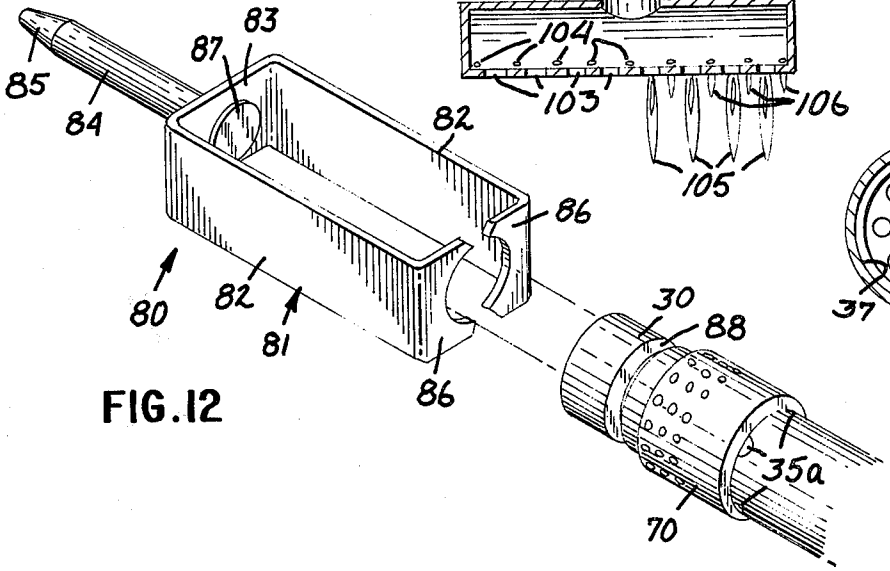


FIG.12

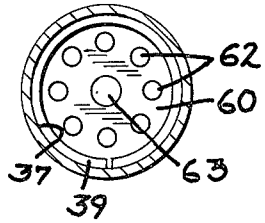


FIG.9

MINIATURE BLOWTORCH

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention pertains to an improved burner assembly for use with a miniature blowtorch which utilizes air as an oxidizer and allows the device to be used either as a blowtorch or as a soldering iron, and is a continuation-in-part of my application filed Dec. 7, 1972, Ser. No. 312,824, now U.S. Pat. No. 3,845,755, and entitled "Gas Heated Paint Scraper".

2. Description of the Prior Art

There are currently available miniature blowtorches which are designed primarily for use with cylinders of compressed gas as a fuel and compressed oxygen as an oxidizer (see U.S. Pat. No. 3,246,849, Aske). While such devices may be adaptable for use with air as an oxidizer, means are not disclosed for the accurate control of the flow of air into the blowtorch burner. In these devices, the cylinders of compressed gas are attached to a mounting head assembly which contains a regulating means to control the flow of compressed gas fuel and compressed gas oxidizer. The cylinders of compressed gas are attached to the mounting head assembly by means of a housing which is screw-fastened to the mounting head assembly. A blow-pipe is typically attached to the mounting head assembly for carrying the fuel-oxidizer mixture to a relatively simple single-orifice nozzle. The nozzle produces an open flame which can be used for welding purposes and the general open-flame heating of materials.

The existing miniature blowtorch designs pose several problems which seriously restrict their use. The use of a cylinder of compressed oxygen as an oxidizer requires that the oxidizer as well as the fuel be prepackaged and kept in supply for use with the torch. This increases the expense and complexity of the torch's operation. In addition, the expense of manufacture of these torches is increased by the use of a fuel cylinder housing which is screw-fastened to the mounting head.

Because existing miniature blowtorches utilize a relatively simple single-orifice nozzle, the nozzle can frequently become clogged when foreign matter blocks the orifice. Also, the single-element flame produced by this nozzle is extremely susceptible to extinguishing by drafts of air. This problem is further compounded by the absence of wind-shielding device on miniature torches. While the open flame produced by present miniature blowtorches is useful in several welding and heating operations, it cannot be used in hot-iron soldering operations where it is necessary to use a heated iron for applying the heat instead of an open flame.

SUMMARY OF THE INVENTION

The present invention is an improved blowtorch burner assembly in combination with a snap-on fuel cylinder housing for use with a miniature blowtorch which utilizes cylinders of compressed gas as a fuel and air as an oxidizer. A U-shaped frame in combination with a snap-on enclosure bracket provides improved means with which to mount the fuel cylinder in place on a conventional mounting head assembly. The improved burner assembly attaches to a fuel carrying blow-pipe extending from the mounting head assembly. The burner assembly comprises a multi-orifice gas diffuser plate inserted into a nozzle in a burner body. A mixing passageway in the burner body connects the nozzle to the blow-pipe and to a venting passageway carrying ambient air which is utilized as an oxidizer. The gas diffuser plate contains a plurality of jet producing openings or orifices to form a single flame surrounded by a plurality of small individual keeper flames which essentially support combustion of the main flame. An orifice cup having an accurately sized opening is inserted into a fuel carrying passageway in the burner body to meter the amount of fuel passing into the nozzle. A filter disc is placed adjacent to the orifice cup to prevent foreign matter or liquid fueld from clogging the orifice. The orifice cup is specially contoured to prevent fibers from the filter disc from clogging the orifice.

A perforated windshield sleeve is slidably mounted on the burner body to provide secondary air inlet ports to maintain proper combustion to small keeper flames which in turn keep the main flame from being extinguished from sudden gusts of air around nozzle area. The windshield sleeve also provides a means of adjusting main flame temperature by being selectively positionable over the air vents in the burner body to regulate the amount of air to mix with the fuel. A removable solder tip is attachable to the burner body and is heated by the nozzle flame for soldering purposes. To further increase the versatility of existing miniature blowtorches, the improved burner body assembly may be attached to the blow-pipe of a conventional miniature blowtorch by means of either threads or an adaptor sleeve which is provided. This adaptor sleeve fits over conventional tapered blow-pipe nozzles and is secured in place by a bayonet-slot coupling device. To provide a wide flame front from the improved burner assembly, A T-shaped manifold is provided for attachment to the burner body.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of a miniature blowtorch with the improved burner assembly and fuel cylinder housing attached;

FIG. 2 is an enlarged cross-sectional view of the blow-torch burner assembly shown in FIG. 1;

FIG. 3 is an exploded perspective view of the burner assembly shown in FIG. 1;

FIG. 4 is a fragmentary cross-sectional view of the burner assembly body utilizing a single-orifice nozzle plate.

FIG. 5 is a fragmentary perspective view of the fuel cylinder housing shown in FIG. 1;

FIG. 6 is a perspective view of an adaptor sleeve;

FIG. 7 is a fragmentary side elevational view of the adaptor sleeve shown in FIG. 6;

FIG. 8 is a cross-sectional view of another miniature blowtorch burner;

FIG. 9 is a view of the blowtorch burner of FIG. 8 taken along the plane 9—9;

FIG. 10 is a perspective view of a T-shaped burner manifold;

FIG. 11 is a cross-sectional view of the burner manifold shown in FIG. 10; and

FIG. 12 is a perspective view of an attachable soldering tip.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1–12 wherein like numerals refer

to like structural elements, the present invention is an improved miniature blowtorch burner assembly **20** with various component parts which can be used in combination with a miniature blowtorch **1.** Miniature blowtorch **1** is of a conventional design and is comprised of a mounting head **3** which carries a gas-directing blow-pipe **4** and which is attached to a cylinder **2** of compressed gas, such as butane, for use as a fuel. The mounting head asembly **3** contains conventional valve means not shown in detail but including a control knob **5** for controlling the flow of the gaseous fuel through blow-pipe **4** into burner assembly **20.** Ambient air is used as the oxidizer for the gaseous fuel. The present invention further comprises an improved fuel cylinder housing **10** which attaches to mounting head assembly **3.**

Fuel cylinder housing **10** is used to attach the fuel cylinder **2** to the mounting head assembly **3** (see: FIGS. **1** and **5**). It also serves as a handle for grasping blowtorch **1.** The design of housing **10** is intended to provide a simple and economical means of attaching it to the head assembly **3.** Housing **10** is composed of a U-shaped frame **11** having two opposed side members **12** joined at one end by base member **13.** The other ends of side members **12** bend inwardly toward the fuel cylinder **2** to form end portions **12***a*. Frame **11** is constructed of a flexible resilient material which allows side members **12** to be flexed inwardly and outwardly from one another. To attach housing **10** to head assembly **3,** the side members **12** are urged toward one another such that end portions **12***a* are received in the annular notch **16** formed in the periphery of mounting head **3.** The edges of lip extension **12***a* may have an arcuate shape to more closely abut the base of the annular groove **16.** When end portions **12***a* are inserted into annular grooves **16,** the side members **12** are in what would be termed a closed position.

To secure side members **12** in the closed position, closure bracket **14** is placed around side members **12** near the end portions **12***a*. Closure bracket **14** slides along side members **12.** When closure bracket **14** is removed from frame **11,** the side members **12** can be spread apart and frame **11** can be removed from mounting head **3.** Enclosure bracket **14** is held in place adjacent to end portions **12***a* by means of a pair of opposed engagement arms, each designated by the numeral **15,** attached to enclosure bracket **14** and which can be inserted into annular grooves **16.**

When housing **10** has been attached to mounting head **3,** fuel cylinder **2** can be held in place adjacent to mounting head **3** by inserting it between side members **12** and be advancing clamping bolt **17** until it urges tank **2** into a fixed position. Thus, by using clamping blot **17** in combination with housing frame **11,** the fuel cylinder **2** is firmly held in position with respect to mounting head assembly **3** and the frame **11** provides one means of holding miniature blowtorch **1.**

Burner assembly **20** disclosed by the present invention and shown in FIGS. **1–3** comprises a burner body **30** which contains a nozzle **31** in communication with a fuel and air carrying first passageway **34***a* and a second passageway **34.** A blow-pipe opening **33** in the end of burner body **30** opposite nozzle **31** is threaded to receive the threaded end of blowpipe **4** and adjoins first passageway **34***a*. The second passageway **34** provides a path for the gaseous fuel from blow-pipe **4** to nozzle **31.**

To provide a source of air as an oxidizer for the combustion of fuel in the first and second passageways **34***a* and **34,** a third (inlet air) passageway **35** is formed in burner body **30.** As is shown in FIG. **2,** third passageway **35** comprises four bores **35***a* extending from the outside surface of burner body **30** to passageway **34.** A different number of bores **35***a* may also be used. The flow of gaseous fuel from blow-pipe **4** through passageway **34** creates a venturi effect in bores **35***a* which draws the outside air through passageway **35** into fuel passagesys **34** and **34***a*. The mixture of gaseous fuel and air is then carried through passageway **34** to nozzle **31.**

Nozzle **31** comprises a conical portion **36** which adjoins passageway **34** at one end and which adjoins a cylindrical portion **32** at the other end (see FIG. **2**). This contouring of nozzle **31** produces a gradually increased cross-sectional area toward the outlet of nozzle **31.** This reduces the velocity of the gas-air mixture as it passes through nozzle **31** from passageway **34.** As a result, a relatively low velocity broad gas jet is produced at the outlet of nozzle **31.**

The amount of gaseous fuel which flows into passageway **34** can be very critical to the production of a proper air-fuel mixture for the burner body assembly. To accurately meter the amount of gaseous fuel which passes from blow-pipe **4** into passageway **34***a* and **34,** an orifice cup **40** is inserted across the end of the blow-pipe **4** and rests against a shoulder **33***a* formed in burner body **30.** This is shown in FIG. **2.** As is shown in detail in FIG. **3,** orifice cup **40** is a cup-shaped element having an inside diameter sized such that the cup **40** can be positioned over the end of blow-pipe **4.** An orifice **42** located in the central portion of orifice cup **40** is precisely sized to provide the exact amount of fuel flow through orifice cup **40.** It has been found that a hole diameter of **0.0050** inch works particularly well for the embodiment shown in FIG. **2.** As is shown in FIG. **3,** the central portion of orifice cup **40** surrounding orifice **42** is indented to form a hemispherical dome **43.** The purpose of this dome will be described later.

To filter contaminants from the gaseous fuel which passes through blow-pipe **4** to prevent clogging of orifice **42,** a disc-like filter **50** is inserted between the opening of blow-pipe **4** and orifice cup **40.** This is shown in detail in FIG. **2.** By placing a filter disc **50** adjacent to orifice cup **40** instead of spacially separating these two elements as is conventionally done (e.g. FIG. **8**), only one portion of the burner assembly **20** has to be disassembled to provide ready access to either the orifice cup **40** or to the filter disc. **50.** To avoid the clogging of orifice **42** by loose fiber ends from filter disc **50,** the dome **43** containing orifice **42** has been provided in orifice cup **40.** This dome allows the orifice **42** to be set off from the surface of filter disc **50** and thus significantly reduces the likelihood that loose fibers from filter **50** can extend into the orifice **42** and thereby clog it.

In conventional blowtorch burners, a single element flame is usually produced from a nozzle having a single opening (see FIG. **4**). Such a single element flame **67** has a tendency to be extinguished very easily by gusts of air or high velocity gaseous fuel air mixture, and may also be extinguished if the gas flow through the single opening is momentarily interrupted by the presence of foreign material in the opening. To avoid these problems, the present invention provides a multi-orifice diffuser plate **60** shown in FIG. **3.** Diffuser plate **60** fits

across cylindrical portion 37 of nozzle 31 and rests on a shoulder 38. A retaining ring 39 is press fitted into the cylindrical opening 37 adjacent diffuser plate 60 to hold it in place. Other suitable means for retaining diffuser plate 60 may also be used.

Diffuser plate 60 contains a plurality of equal-size peripheral openings 62 located equidistant from the center of diffuser plate 60 and generally near its edge. A central opening 63 is located in diffuser plate 60 and is larger than the peripheral openings 62. The arrangement of openings in diffuser plate 60 provides a generally large central flame 68 through opening 63 surrounded by a plurality of smaller keeper flames 69 emanating through openings 62. With this arrangement of openings, the ignition point of the individual small keeper flames is positioned relatively near the diffuser plate 60. I have found that this plurality of small keeper flames maintains combustion of the single flame 68 and is less likely to be extinguished by foreign particles which may clog one of the openings in the diffuser plate 60 or a side gust of air. In particular, the use of several small orifices increases the total open space through which the air-fuel mixture passes in the nozzle 31 thus reducing the velocity of the gas as it passes through the openings 62 and 63 according to the classic theories of fluid flow. This allows the individual keeper gas jets to be ignited nearer the orifice plate 60 due to secondary air inlet ports on windshield sleeve 70. FIG. 2 shows the general location of the flames produced by the diffuser plate 60 and FIG. 4 shows the general position of a single flame 67 emanating from a burner body 30 which contains a single-hole orifice plate 65 across the nozzle 31. With flames 68 and 69 positioned closer to diffuser plate 60, the inventor has found that the main flame is less likely to be extinguished by gusts of air.

To further confine the peripheral keeper flames 69 emanating from openings 62 and to partially shield the flames from gusts of air, a perforated windshield 70 (see FIG. 3) is mounted on the exterior of diffuser body 30 adjacent to nozzle 31. As is shown in FIG. 2, a portion of windshield 70 extends out past the end of burner body 30. The perforations 71 in windshield 70 allow enough secondary air to flow around the base fo the peripheral keeper flames 69 to provide keeper flame ignition to the small flames which in turn keep the central flame 68 ignited at all times. This creates a more resilient combined central flame 68.

It is also the purpose of windshield sleeve 70 to serve as a regulating means to control the amount of inlet air which passes through passageway 35 to fuel carrying passageways 34*a* and 34. To accomplish this, windshield sleeve 70 is slidably located on the exterior of burner body 30 and can be moved down from its shielding position to a plurality of regulating positions in which a portion of it extends either partially or totally over bores 35*a*. This regulation of the supply of inlet air entering passageway 34 through passageway 35 varies the heat of the flame 68 emanating from nozzle 31. One such position of windshield 70 on burner body 30 is shown in FIG. 1. Windshield 70 is shown completely displaced from passageways 35*a* in FIG. 2. A slot 72 in windshield 70 provides a frictional fit between it and burner body 30. Other means of attachment may also be used. This ability to selectively position windshield 70 along the exterior of burner body 30 also has a second purpose which will be described in detail later.

FIGS. 10 and 11 show a T-shaped manifold 100 which slides over the nozzle end of burner body 30. The manifold 100 is comprised of a transverse portion 102 and a base portion 101. A plurality of large openings 103 and small keeper flame openings 104 and transverse closed end portion 102 provide a plurality of main flames 105, and small keeper flames 106 respectively which produce a wide short length flame front to heat a broad surface. Base portion 101 provides a frictional fit, and is slipped over burner body 30 for use on the miniature blowtorch 1.

While an open flame emanating from nozzle 31 can be used in the welding of materials or in the heating of a surface such as a ski surface which is being waxed, it is often desirable to use a source of heat which is not an open flame. Such a need would arise in the case of the hot-iron soldering of electrical components. To provide this capability in a miniature blowtorch, the present invention provides a removable solder tip 80. As is seen in FIG. 12, solder tip 80 is comprised of a support frame 81 which can be attached to burner body 30. Support frame 81 consists of two opposed leg members, each designated by the numeral 82, joined at one end by a base member 83. To attach the frame 81 to the burner body 30, two lip extensions 86 are provided at the open end of leg members 82. Lip extensions 86 fit into an annular groove 88 formed in the exterior of burner body 30. In the embodiment shown in FIG. 12, the frame 81 is constructed of a resilient metal which provides a biased position to leg members 82. In this biased position, lip extensions 86 tend to move toward one another so as to be firmly positioned in groove 88. To remove the solder tip 80 from burner body 30, leg members 82 are spread apart and the solder tip 80 is disengaged from burner assembly 20.

A solder tip 84 having a tapered end 85 and a base end 87 is attached to support frame 81 as is shown in FIG. 12. Heat from the flame 68 heats frame base member 83 and by convection also heats solder tip 84. Solder tip 84 may be attached to frame 81 by various means including the use of a screw-type attachment so that different tips (not shown) may be applied to the same frame 81. As is shown in FIG. 12, the windshield 70 is moved back on burner body 30 when the solder tip 80 is attached to the burner assembly 20. In this position, the windshield 70 can still be used to regulate the flow of inlet air through passageway 35 as was described earlier, while leaving groove 88 exposed.

In the embodiment shown in FIGS. 1–3, the burner assembly 20 is attached to blow-pipe 4 by means of threads 4*a* at the end of blow-pipe 4 which match threads 3*a* on the interior of burner body 30. In existing miniature blowtorches, there may be a tapered nozzle 98 (such as is shown in FIG. 6) at the end of blow-pipe 4 rather than threads. In such an instance, a slip-on adaptor sleeve 90 may be used to adapt the burner assembly 20 to the tapered nozzle 98. This is shown in FIGS. 6 and 7. Adaptor sleeve 90 is comprised of a cylindrical member 91 with passageways 93 and 94 extending through it. Threads 92 on member 91 are adaptable to the threads 3*a* in burner body 30 for attachment of the sleeve 90 to the burner body. The passageway 94 has a tapered shape designed to fit over the tapered nozzle 98. To form a seal between passageway 93 and the tapered nozzle 98 of blow-pipe 4, an O-ring 95 is provided at the end of tapered passageway 94. Thus, the tapered nozzle 98 would fit into the area

within the O-ring **95** and the contact between that surface and O-ring **95** would form a gas seal.

To hold sleeve **90** in place on nozzle **98**, a bayonet-like member **97** would be present on the nozzle **98**. A helical groove **96** formed at one end of cylinder **91** would engage the bayonet **97** as cylinder **91** mates with nozzle **98**. Thus, as the slip-on adaptor **90** is twisted on to nozzle **98**, the bayonet **97** would form a tight union between the cylinder **91** and the blow-pipe **4**. Because slip-on adaptor **90** can be easily screwed into burner body **30**, the same burner body **30** can be used interchangeably between a blow-pipe **4** having threaded ends and a blow-pipe **4** with a tapered end **98** on it.

The operation of the present invention can be summarized as follows. The gas cylinder housing **10** is assembled to mounting head **3** by inserting end portions **12***a* of housing frame **11** into annular groove **16**. Closure bracket **14** is then snapped into place in annular groove **16** to hold housing **10** to mounting head **3**. A cylinder of compressed butane gas can then be inserted between housing side members **12**. The cylinder **2** is then moved forward into abutting engagement with mounting head assembly **3** by tightening clamping bolt **17** extending through the base member **13** of mounting frame **11**.

The flow of butane gas from cylinder **2** to blow-pipe **4** is contolled by valve knob **5** attached to the mounting head assembly **3**. The improved burner assembly **20** can be attached to blow-pipe **4** by means of threads **4***a* at the end of blow-pipe **4** or by means of a slip-on adaptor **90** which can fit over a tapered nozzle **98** on blow-pipe **4** which contains a bayonet **97**.

When the valve knob **5** on mounting head assembly **3** is turned to allow gaseous butane fuel to flow through blow-pipe **4**, the gas flows through passageway **34** and **34a** in burner body **30** to nozzle **31**. As the gas passes through passageway **34** and **34***a*, it creates a venturi effect which draws outside air in through passageways **35** to mix with the gas. The combined air-gas mixture passes through holes **62** and **63** in diffuser plate **61**. Orifice cup **40** which contains an orifice **42** is placed between passageway **34** and **34a** and the end of blow-pipe **4** to meter the flow of gas. Filter disc **50** is placed between the orifice **42** and the end of blow-pipe **4**. Because the orifice cup **40** has a hemispherical portion **43** surrounding orifice **42**, loose fibers from filter disc **50** are not likely to clog the orifice **42**. Filter disc **50** removes contaminants from the gas emitted from the cylinder **2** and also prevents the passage of condensed liquid butane gas which may proceed as far as the filter disc in blow-pipe **4**. As the liquid gas reaches filter disc **50**, it is absorbed by the filter and only gaseous butane fuel passes beyond that point through orifice **42**.

As the gas-air mixture passes through diffuser plate **60**, a central gas jet through opening **63** and smaller peripheral keeper gas jets passing through orifices **62** are formed. When these multiple keeper gas jets are ignited, they combine to form a single-flame stem with the peripheral flames acting to support combustion to the central flame. Thus, this combined flame is more resistant to extinguishing if one of the orifices in diffuser plate **60** becomes mementarily clogged by contaminants or if a gust of air impinges on the flame.

A perforated windshield **70** is provided on the exterior of burner body **30** and can be moved along burner body **30**. when it is positioned with a portion of it extending beyond burner body **30**, it forms a windshield for the keeper flames and main flame emitted from nozzle **31**. This helps confine the peripheral flames emanating from diffuser plate **60** and tends to prevent the extinguishing of the main flame from side drafts. The windshield **70** has the second purpose of regulating the flow of air through passageways **35**. To do this, it can be moved to a selected position wherein a portion of the windshield **70** covers a portion of the openings to passageway **35**. This decreased the amount of air going through passageway **35** and produces a cooler flame.

When it is desired that the miniature blowtorch burner assembly **20** be used as a soldering iron, solder tip means **80** are positioned on burner body **20**. This is accomplished by spreading the leg members **82** apart and placing the lip extensions **82a** in annular groove **88** on burner body **30**. Because of the resilience of the metal which the solder tip frame **81** is constructed, the biased positioning of side members **82** holds the solder tip means **80** in position on burner assembly **20**. Before the solder means **80** is positioned on burner body **20**, the windshield **70** is moved back on body **30** to a position below the annular groove **88**. When it is desired to remove the solder tip means **80** from burner body **30**, the process is reversed and the side member legs **82** are spread apart so that the lip extensions **82** disengage the annular groove **88**. To produce a broad flame front, the T-shaped manifold **100** may be attached to burner body **30**.

The arrangement shown in FIGS. **8** and **9** is similar to that of FIGS. **5** and **6** respectively of the drawings of the parent application, Ser. No. **312,824**, referred to above. In this arrangement, an orifice cup **114** is spaced from a filter cartridge **116** that is contained in the upper end of a passage **117**. A diametrically reduced passage portion extends between the cartridge **116** and the orifice cup **114**.

It will be understood that this invention is capable of further modification without departure from the spirit and scope of the claims.

What is claimed is:

1. A miniature blowtorch apparatus of the type utilizing an attached cylinder of compressed gas in cooperation with a mounting head assembly, wherein the improvements comprise a snap-on cylinder housing for removably positioning the gas cylinder in fixed relationship to the mounting head assembly, said housing comprising:

a. an annular groove formed in the outer surface of the mounting head assembly;

b. a resilient U-shaped frame having two opposed side members and a base member for partially enclosing the sides and bottom of the gas cylinder, said side members each having an inwardly extending end portion opposite said base member for insertion in said annular groove, said frame side members having a first position in which the end portions are inserted in said annular groove to partially enclose the gas cylinder, and a second position in which said end portions are spread away from the annular groove to thereby disengage said housing from the mounting head assembly;

c. a closure bracket removably positioned around said frame to confine said frame side members in their first position, said closure bracket being slidably movable on said support frame to allow the frame side members to be moved to their second position, said closure bracket being attachable to

the mounting head assembly to thereby hold said closure bracket in place around said frame side members; and

d. a clamping bolt extending through said frame base member and advanceable against the gas cylinder contained between said frame side members to hold it in fixed position.

2. The miniature blowtorch apparatus defined in claim **1** in which said mounting head assembly includes a blow-pipe, characterized by a burner body having a first end providing a nozzle and a second end mounted on said blow-pipe, a first passageway extending between said blow-pipe and said nozzle, said body having a second passageway extending from outside the body to said first passageway, said nozzle including a gas diffuser plate having a central hole therethrough and a plurality of peripheral holes therethrough, all of said peripheral holes being of equal diameter smaller than the diameter of said central hole and at equal distance from said central hole, each of said central and peripheral holes providing a separate flame as gas passing therethrough is ignited.

3. The miniature blow-torch apparatus defined in claim **2** further including a perforated windshield having axially opposite ends and encompassing said body and and axially slidable thereon between one extreme position wherein a portion of the windshield at one end extends outwardly from the burner body beyond the nozzle and a second position wherein said one end is disposed axially inwardly with respect to the nozzle and the other end thereof covers a selected portion of said second passageway to thereby regulate the flow of air through the second passageway to control the heat of the flame produced at said nozzle.

4. In a miniature blow-torch apparatus of the type utilizing ambient air as an oxidizer and having a cylinder of compressed hydro-carbon gaseous fuel in cooperation with a mounting head assembly including a blow-pipe and a valve for regulating the gas flow through said blow-pipe;

a. a tapered end on said blow-pipe;

b. a tube-like adaptor sleeve member having a threaded outer end and an inner end containing a tapered opening for accomodating said tapered end of a blow-pipe;

c. said blow-pipe and adaptor sleeve having interengaging bayonet coupling portions for mounting said adaptor sleeve on said blow-pipe;

d. a burner body having a first end which forms a nozzle and a second end mountable on the threaded outer end of said adaptor sleeve, said body having a first passageway extending between said adaptor sleeve and said nozzle and a second passageway extending from an outside opening to said first passageway to carry air to said passageway;

e. a filter removably inserted in said first passageway between said adaptor sleeve and said second passageway for preventing the passage of particulate matter and liquid therethrough;

f. a rigid member having an orifice for partially restricting the flow of gas therethrough, said member being removably mounted in said first first passageway abutting said filter, between said filter and the second passageway, said member having a concave center portion surrounding the orifice to space the orifice from said filter;

g. and sealing means in said tapered opening of the adaptor sleeve in sealing engagement therewith and with said tapered end of the blow-pipe when said bayonet coupling portions are inter-engaged to provide a sealed passageway between said tapered end and the second end of said burner body.

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