

[54] **INFRA-RED PROCESS BURNER**

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[58] **Field of Search**..... 431/328, 326, 329;
126/92 R, 92 AC, 92 B, 92 C, 39 D

[56] **References Cited**

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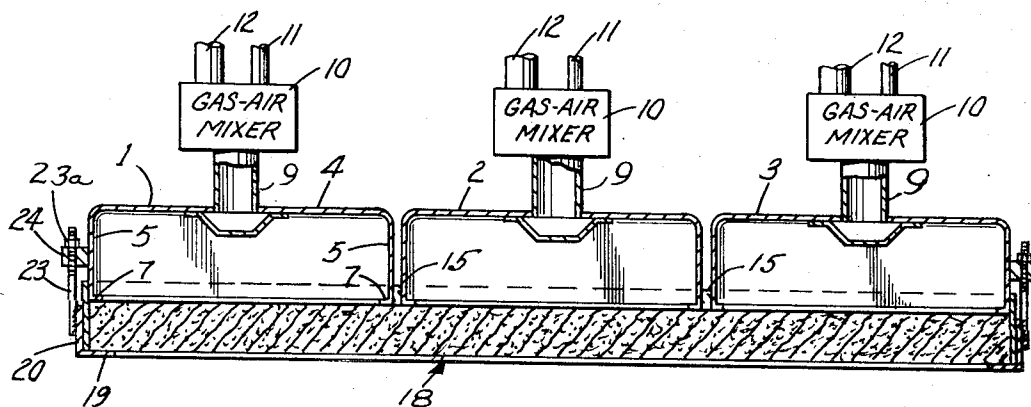
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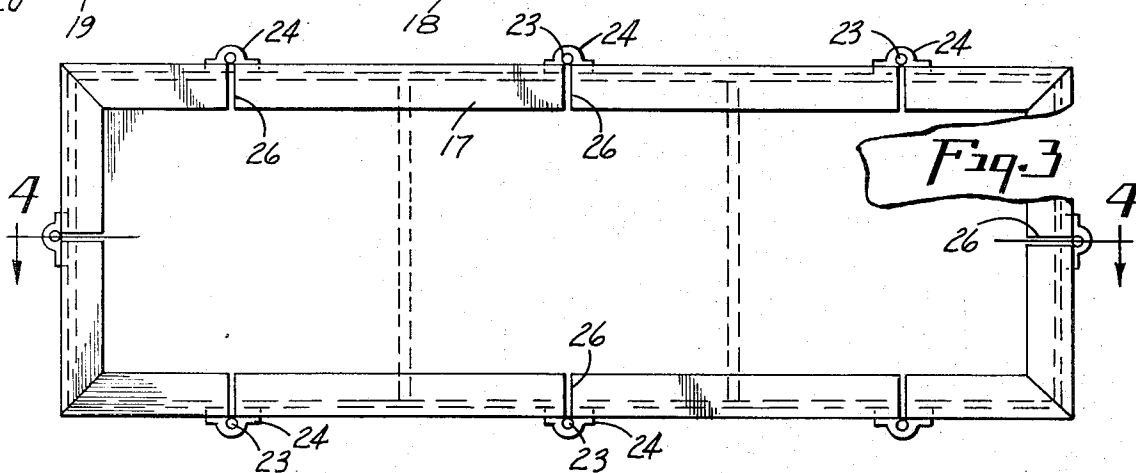
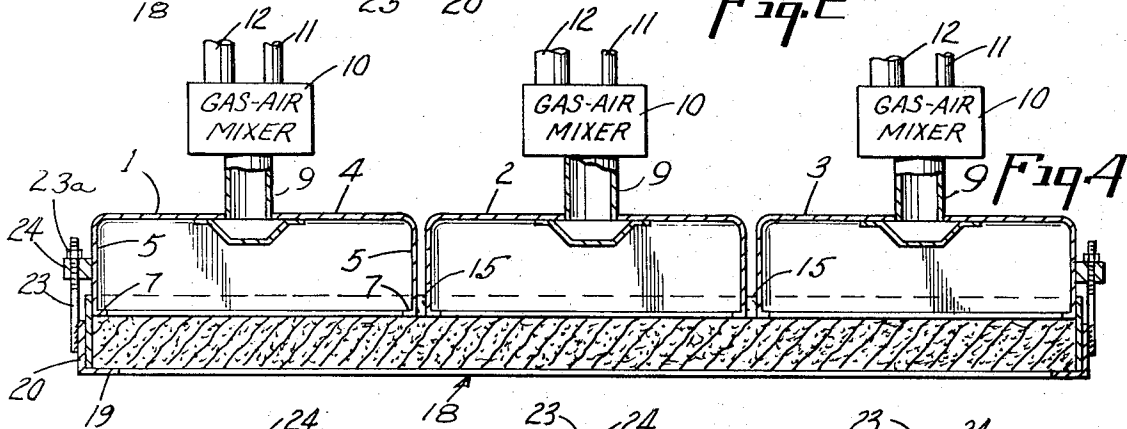
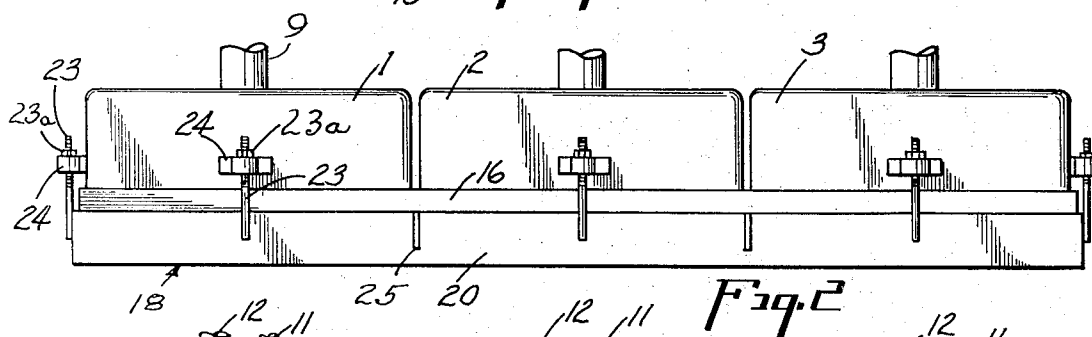
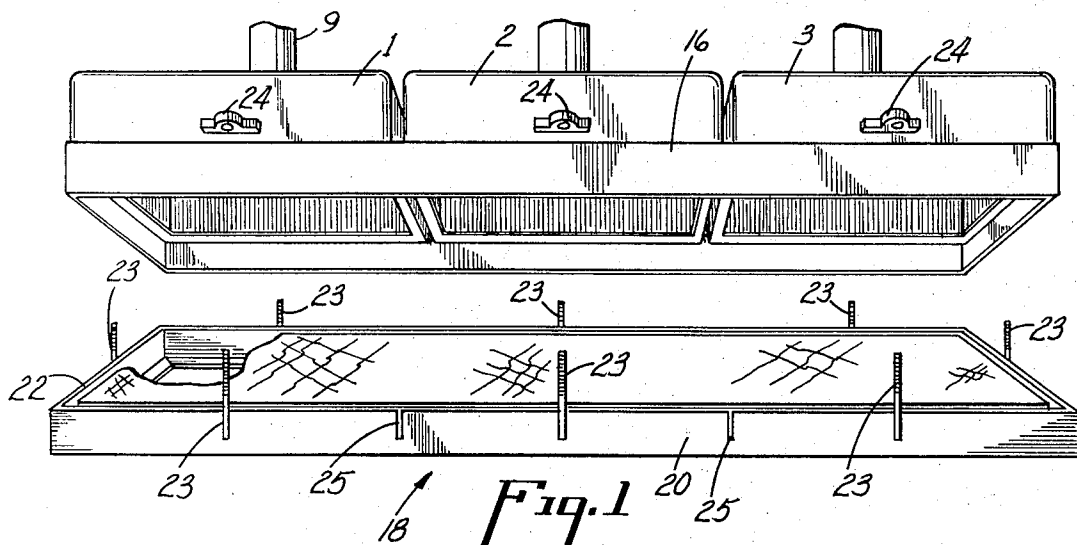
[57] **ABSTRACT**

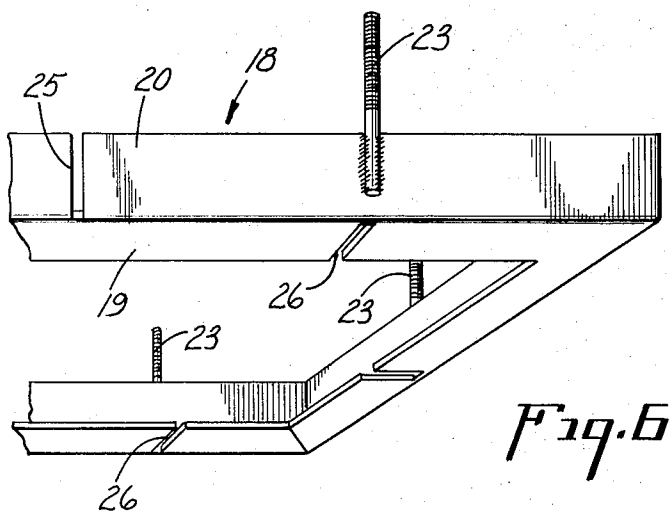
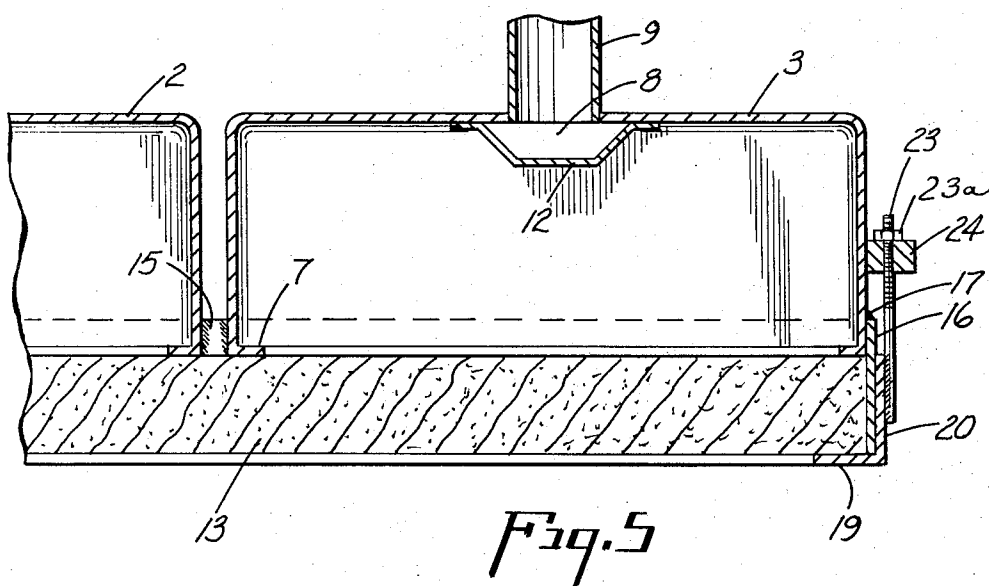
There is disclosed an infra-red process burner, comprised of individual sections rigidly fastened together to provide a generally elongated unit having a common continuous burner face, infra-red generation being controllable in each section and operable in unison to avoid longitudinal areas of material passing therebeneath from receiving less heat than adjacent areas, or individually operable to selectively heat along strips, the virtually instantaneous generation of infra-red heat and termination thereof because of the composition of the burner face, facilitating accurate control of the use of the burner for process treatment of material of widely varying types.

4 Claims, 6 Drawing Figures



SHEET 1 OF 2





INFRA-RED PROCESS BURNER

OBJECTS OF THE INVENTION

It is a principal object of this invention to provide a process burner capable of generating infra-red heat, which is comprised of individually controllable sections, adapted to cause the infra-red generation thereof to be directed toward material passing therebeneath without causing the material to be differently affected by the infra-red generation directed thereto, and on the other hand to be able to terminate the direct generation of infra-red heat instantaneously when desired, the composition of the burner face by which the infra-red heat is generated being important in the overall consideration.

Another object of the invention is to provide a burner face, which while generally a continuous face and capable of producing infra-red heat over a relatively long period, may nevertheless be individually controlled as to the heat generated both in heat ranges and elimination of heat instantaneously with varying strips of heat directed toward material to be treated thereby for various purposes.

Another object of the invention is to provide a process burner in which a series of burner bodies are connected together in an integral manner, having open faces over which stems a burner face of special fibrous felt insulation material, in a continuous manner, the burners being close enough together that when they are all in operation, will avoid a narrow thin area of unheated or non-heated material, and thereby the material being processed will also be heated uniformly over a relatively wide width, the actual mechanical construction of the heater being such that differences in expansion and contraction caused by temperature changes in the individual burner bodies do not seriously adversely affect the integrity of the unit.

Other and further objects of the invention will be understood from a consideration of the specification appended hereto and disclosed in the drawings, wherein:

FIG. 1 is a perspective view, showing the basic burner bodies in assembled relation with the burner face and its retaining rim spaced therefrom in perspective.

FIG. 2 is a side elevation of the burner unit of FIG. 1.

FIG. 3 is a bottom plan view of the unit, shown in FIG. 2.

FIG. 4 is a sectional view, taken about on the line 4—4 of FIG. 3, looking in the direction of the arrows.

FIG. 5 is a sectional fragmentary view, showing in enlarged form one burner body, its connection to the one adjacent and the arrangement of the burner face and its retaining rim.

FIG. 6 is a perspective view, fragmentary in nature, showing more particularly the construction of the retaining rim for the burner face.

DESCRIPTION OF THE INVENTION

Referring to FIG. 1, the burner construction hereof is made up of a series of burner bodies 1, 2 and 3, of generally rectilinear construction, each being substantially identical and including a main side 4 with the depending sides 5 and 6 forming a downwardly open substantially rectilinear body having an intumed lip 7

around the periphery of the opening provided, this lip being more clearly shown in detail in FIG. 5.

The individual burner bodies 1, 2 and 3 include an opening in the upper side of each as suggested in FIG. 5, and denoted 8, adapted to be connected to a conduit 9 which in turn extends from a gas air mixture unit 10, referring to FIG. 4, which is supplied by the gas line 11 and air line 12, this being a common and well known mixer unit and not further described in detail, a mixer unit of this nature denoted 10 being supplied for each of the burner bodies 1, 2 and 3.

In the burner body in each case is a baffle 12 which assists in disbursing the entering gas air mixture so as to be properly distributed toward the face generally designated 13 and now to be more particularly described.

The burner face 13 is comprised of a fibrous felt insulation material, being a mat of substantial thickness and formed of an alumina silica composition, having a substantial chromic acid content, in this case the mat being continuous from end to end on the burner so to speak, and thus of an elongated generally rectangular nature when considered in plan.

The thickness of this material which is substantial, is of such a nature as to be reasonably rigid so as to be self-supporting when in a condition shown in the various figures upon the lower face of the burner bodies in assembled relation, although obviously the unit might be used in a reverse condition and produce similar and substantially equivalent results.

In any event, the burner bodies 1, 2 and 3 are fastened as suggested in FIG. 5 by welding along adjacent lower edges thereof at 15 so that the bodies thereupon become substantially integrated and are further equipped with a peripheral band 16 extending along the lower edges as suggested in FIG. 5, and being fastened as by welding at 17 thereto, this band 16 providing a space within which the burner face 13 may be positioned, the burner face of course being supported and maintained in conjunction with faces of the respective lips 7 in each case, and confined by the band 16.

In order to retain the burner face 13 in position as suggested in FIG. 4 as well as FIG. 5, a suitable retaining rim more particularly illustrated in plan in FIG. 3 and designated 18, being formed of angle material including face engaging portion acting as a lip and denoted 19, and an upright section denoted 20, in essence being a continuous angle iron or like member having longitudinal portions 21 and the transverse portions 22 comprising the integral unit just heretofore described.

Extending upwardly from the upright section 20 and at intervals therearound are the studs 23 having threaded ends thereon, adapted to be received in suitable ears 24 fastened to the sides 5 and 6 of the burner bodies 1, 2 and 3.

The application of nuts such as shown in FIG. 2 and denoted 23a is contemplated to retain this retaining rim in place and thereby likewise retain the burner face 13 in position over the openings in the lips 7 of each burner body 1, 2 or 3.

It is contemplated that this retaining rim 18 will thus cause the burner face 13 to be maintained in close and sealed relationship with the lips 7 of the burner bodies 1, 2 and 3.

It is notable that the retaining rim 18 is provided with a series of slots 25 in the upright section 20, arranged

3

at least as to certain of the slots so that the same are opposite the juncture of the burner bodies 1, 2 and 3 and specifically at the welded areas thereof.

Additionally, certain slots 26 such as are shown in FIGS. 3 and 6, are located in the face engaging portion of the retaining rim 18, these being arranged in alternate relationship to the slots 25 previously described.

This construction is designed to prevent undue twisting or warping action of the retaining rim when the heat is developed by the burner, irrespective of the particular burner body which is producing the heat as will be more clearly described subsequently.

Bearing in mind that the slots 25 and 26 are arranged alternately, it will be seen that the twisting stresses developed by heating the retaining rim 18 are prevented from adversely affecting the ability of the retaining rim to maintain the burner face 13 in sealed condition within the band 16 and against the lips 7.

With this in mind, it will be noted that any one of the burner bodies 1, 2 or 3 may be caused to generate infra-red heat by suitably igniting the gas and air mixture which is delivered through the burner face 13 in the area immediately opposite the respective burner body, and thereby an area of any predetermined width may be heated, or an entire width, for example, of material passing beneath the burner may be heated.

It is of course feasible to heat the areas passing beneath the burner bodies 1 and 3, or 1 and 2, or any other combination, and to instantaneously terminate such heat by reason of the peculiar nature of the burner face 13 and the composition of material from which the same is constructed.

It is also noted that narrow material may be heated under one section of the unit as specifically for example under the burner body 1, and of course wider material may likewise be treated where more than one burner body is ignited and caused to operate to produce infra-red heat.

It is pointed out additionally that more burner bodies might be assembled in the manner herein described so as to provide for greater widths of coverage where the same is used as a process burner for example, and distortion of the bodies and assembled unit is maintained

4

at a minimum by reason of the construction of the retaining rim and its associated parts.

It is extremely desirable to provide for a single face in a burner to produce infra-red heat without having lines in material being treated, and be heated to a less degree than is true of the central portions of each burner body and thus the fact that the material from which the burner face is constructed is one which will produce such infra-red heat in a uniform manner without the separation caused by separate burner bodies which are desirable to maintain the control which may be particularly important under some circumstances.

I claim:

1. In infra-red process burner construction of the class described, in combination, a unitary burner assembly comprising a series of generally rectilinear burner bodies, each having an open face receiving section, said bodies being rigidly fastened together with said sections in alignment, a gas air mixture supply for each body, a single burner face member comprising a fibrous mat of alumina-silica composition having a substantial chromic oxide content extending along said bodies and seated in the face receiving section of each, a face retaining rim extending around the periphery of the assembled bodies and maintaining the face member in place thereon, means to removably fasten said rim in place on said bodies, and means to compensate for heat induced twisting stresses in said rim whereby to maintain said burner face in sealed engagement with the bodies in the face receiving section of each.

2. The combination as claimed in claim 1, wherein the retaining rim comprises an angle member having a face engaging portion and an upright section integral therewith.

3. The combination as claimed in claim 2, wherein the portion is formed with transverse slots at intervals and the section is formed with similar slots at intervals intermediate the slots in the engaging portion.

4. The combination as claimed in claim 2, wherein transverse slots are alternately formed in the portion and section, at least certain of the slots in the section being located at the juncture of the bodies.

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