

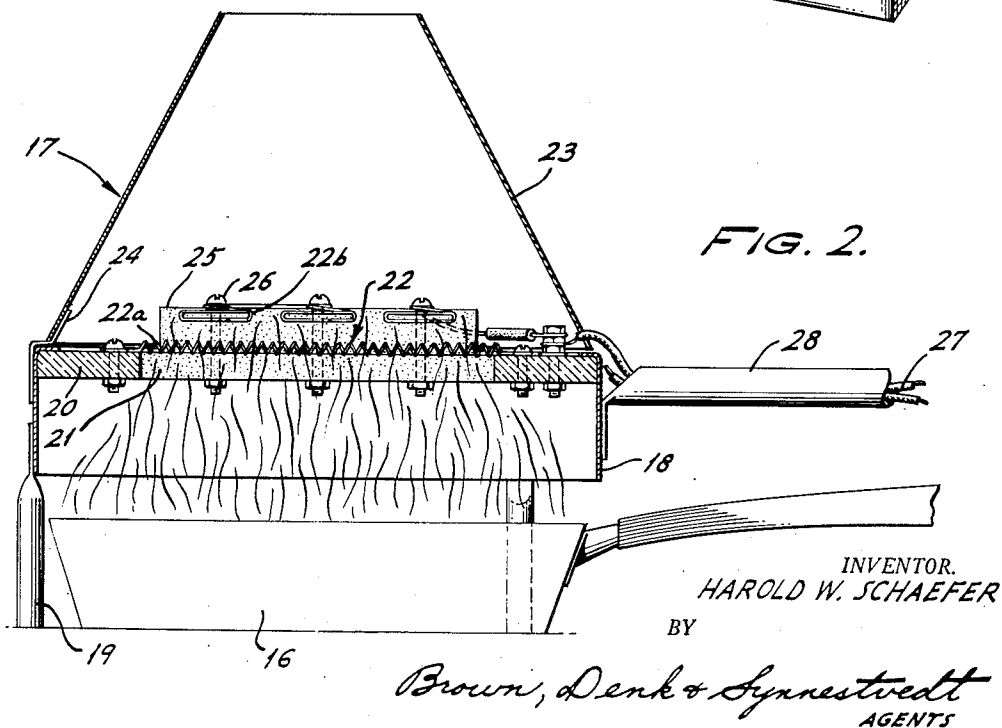
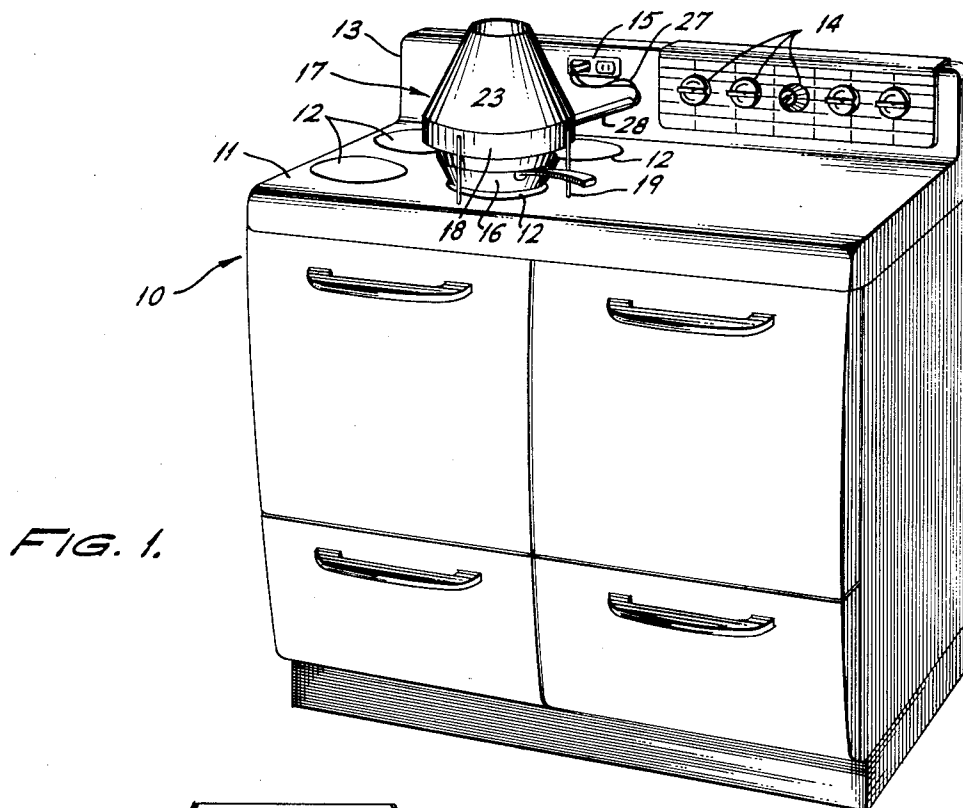
Dec. 3, 1957

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SMOKE AND ODOR ELIMINATOR

2,815,427

Filed Aug. 27, 1954

2 Sheets-Sheet 1



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FIG. 3.

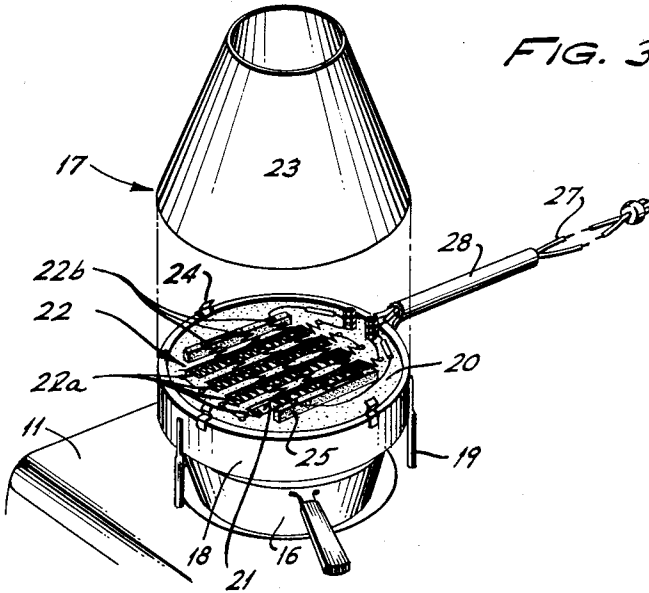


FIG. 4.

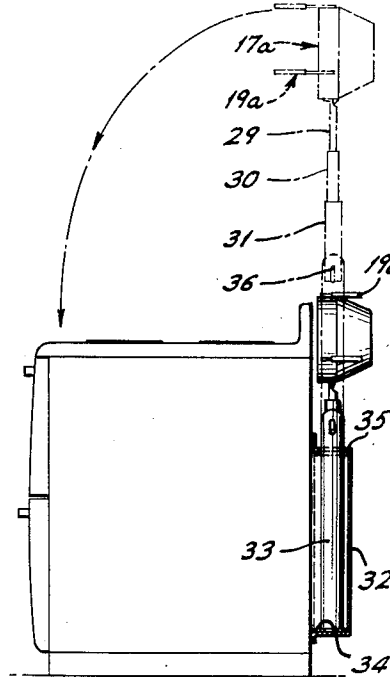


FIG. 5.

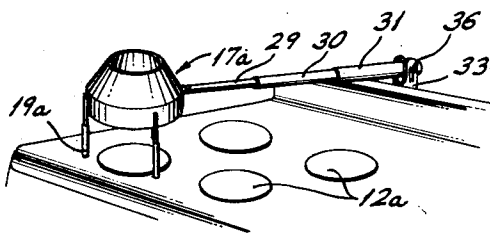
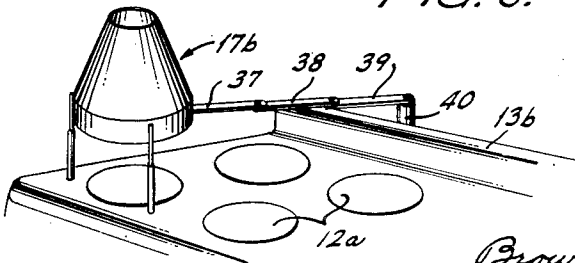


FIG. 6.



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SMOKE AND ODOR ELIMINATOR

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Application August 27, 1954, Serial No. 452,479

4 Claims. (Cl. 219—19)

The invention hereinafter described and claimed has to do with apparatus for removing smoke and odors and, more particularly, relates to the removal of objectionable vapor-borne smoke and odors which commonly emanate from cooking ranges of the type having heating elements or "burners" disposed in surface portions of the range.

In one aspect, the present invention is concerned with elimination, by catalytic incineration, of the smoke and odors frequently arising from use of cooking equipment.

During the use of open top cooking vessels on the surface heating elements of cooking ranges, vapors are given off in large quantities and certain components of these vapors, frequently the grease components, are highly objectionable, both from the standpoint of odor and because of the problem of maintaining the cleanliness of adjacent kitchen surfaces and materials.

Many attempts have been made to meet this problem, one of the earlier endeavors being represented by the familiar hood structures which have, in the past, frequently been utilized with cooking equipment. Blowers have also been employed to withdraw the objectionable smoke and odor-laden vapors emanating from cooking vessels and to discharge them through a suitable flue or passageway leading outdoors. However these, and other devices which have been utilized in an effort to meet the problem with which this invention is concerned, have not met with substantial success, particularly when adapted for use in modern domestic kitchens. In brief the problem has remained and, to a large extent, this has been the case because it has not been recognized that the mentioned smoke and odors could or should be eliminated at their source.

With the foregoing in mind, it is the primary object of this invention to eliminate the nuisance referred to above by treating the smoke and odor-laden vapors as they arise, and at their source, before there has been an opportunity for such vapors to spread through the kitchen.

In one aspect of the invention it is also an objective to provide, in combination with the surface heating elements of a cooking range, apparatus for treating vapors in a region directly overlying the cooking vessels, this advantageous result preferably being achieved through the agency of apparatus adapted to effect catalytic incineration of the objectionable components of said vapors.

A further and more important object of my invention is to provide simple and inexpensive treating equipment featured by the fact that it is so associated with the cooking range as to be mounted for movement across the upper surface of the latter, being disposable over the heating elements selectively and individually.

To the foregoing general ends the invention contemplates provision of a treating device, preferably hood-like in general form, which is mounted for movement as aforesaid and is disposable over the mentioned heating elements, selectively and individually, in position to overlie

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the cooking vessel supported upon the heating element in use.

While, as set forth in what follows, the invention is applicable to a field broader than the range art, the following description and the accompanying drawings, for exemplary purposes, disclose the invention as embodied in a domestic electric cooking range. The range could of course be of the gas type, if desired.

In accordance with one embodiment of the invention, a treating device of the kind contemplated is so associated with the range as to be movable between a retracted or stored position, preferably within or adjacent the rear splashguard commonly provided on ranges, and an operative position closely overlying a cooking vessel, mounting of the device being done through the agency of articulated and flexible means. By virtue of this mounting, the treating device may be moved into cooperative relation with respect to any one of a plurality of upwardly presented heating elements provided on the top surface of the range.

In the drawings:

Figure 1 is a perspective illustration of a domestic range of the electric type showing, in cooperative relation with a cooking vessel supported upon one heating element of said range, a vapor treating device embodying the principles of the invention;

Figure 2 is a vertical sectional view showing, on an enlarged scale, the treating device illustrated in Figure 1;

Figure 3 is a perspective view showing an arrangement of catalytic treating coils which may be employed and illustrating the manner in which hood structure is co-operable with said coils to induce a draft upwardly through the zone of treatment;

Figure 4 is a side elevational view of one embodiment of the invention illustrating the manner in which the treating device may conveniently be mounted for movement between operative and storage positions;

Figure 5 illustrates, in perspective, a treating device of the kind appearing in Figure 4 showing said device in operative position; and

Figure 6 is an alternative embodiment illustrating another form of articulated means for mounting the treating device.

Now making more detailed reference to the drawings, and initially to Figures 1, 2, and 3 thereof, it will be seen that the invention is shown as embodied in an electric cooking range designated generally by the reference numeral 10, said range having a top or work surface 11 within which are mounted a plurality of upwardly presented surface type heating elements 12. The range is provided, along its upper rear edge, with the usual splashguard 13 upon which are disposed suitable devices 14 adapted to control the range oven and the mentioned heating elements, and with electrical outlet means appearing at 15.

In particular accordance with the present invention there is provided, and shown in cooperative relation with a cooking vessel 16, a vapor treating device designated in its entirety by the reference numeral 17.

This device 17 comprises, in the preferred embodiments illustrated, a ring-like metallic frame 18 supported by legs 19, which latter may, if desired be telescopic, to provide for adjustment of the position of the device 17 with respect to the underlying cooking vessel. By means of these legs the ring-like metallic frame 18 is spaced from the top of the underlying vessel 16. This arrangement enables the frame 18 to operate as an air and vapor inlet structure, admitting to the vapor treating element 22 not only the material to be incinerated, from the vessel 16, but also a free flow of air, from the surrounding atmosphere.

where. Supported within the upper portion of the ring-like frame 18 is a block or sheet 20 of insulating material. This block is provided with a number of parallel slots shown at 21 (see Figures 2 and 3) to permit passage of the vapors through treating coils 22 and upwardly through a hood 23 which is removably carried upon outer peripheral portions of the ring-like frame 18, as by means of spring fingers shown at 24. The hood 23 serves to induce a draft through the device, insuring that the vapors emanating from the vessel 16 pass through the zone of treatment prior to being discharged within the kitchen.

Preferably, and in the embodiment illustrated, catalytic incineration is relied upon in treatment of the vapors. Treatment is accomplished by causing the vapors to move past treating coils which are coated with a suitable catalyst, for example platinum, and are maintained at the elevated temperature required for satisfactory activity of the catalyst. Preferably, and as shown, treatment is effected through the agency of wire coils having ohmic resistance such that when the coils are energized from a suitable source of electric current (for example a 115 volt supply) the temperature of said coils will be raised to the appropriate value, for example a temperature of about 750° F.

As illustrated the composite coil comprises seven coil sections, four of which, identified at 22a, are disposed in the above mentioned slots 21 provided in the insulating sheet 20, whereas the remaining three, represented at 22b, overlie the sections 22a and extend at right angles thereto, being carried by support members 25 secured to sheet 20 as by means of screws shown at 26. The reason for this double layer construction is that I have found that disposition of the coil sections at several levels insures that there will be complete catalytic incineration of the objectionable components of the vapors under treatment.

In the present disclosure the several coil sections are connected in series and fed through a supply cord 27 extending through handle 28 and adapted to be energized from the outlet 15, as is clear from Figure 1.

While there are a number of ways in which a suitable treating coil may be fabricated, I prefer to utilize as the base of this coil, wire of a nickel-chromium alloy, for example the alloy known as Nichrome. In preparation of the catalytic treating coil, a ground coat of suitable porous material is applied to the wire, after which it is dipped in a preparation known as chloroplatinic acid. Following this dipping operation the temperature of the wire is raised to a value such as to cause breakdown of the chloroplatinic acid, with the result that the chlorine is driven off leaving platinum on the base wire in the form of a finely divided metallic coating, commonly referred to as platinum black. With the number, type and disposition of coil sections as shown, it is readily possible to select resistance values such that the temperature of the composite coil is raised to the region of about 750° F., at which temperature the catalyst is highly active and objectionable smoke and odors passing upwardly through the coil are completely eliminated.

The apparatus just described is startlingly effective, it being possible to place the treating device over a frying pan in which fat is burning and from which there is emanating clouds of odorous black smoke, and to remove the smoke and odors to such an extent that they are not detectable even in the region directly overlying the device.

The nature of the catalytic treating device per se, and the manner in which it is cooperable with the surface heating elements of a cooking range, now having been fully set forth, reference is had to Figures 4 to 6, in which are illustrated embodiments in which the treating device is mounted upon an articulated and extensible arm, in order that it may be movable between an operative position, overlying any of the several heating elements, and a retracted position convenient for storage.

In the form of Figures 4 and 5, for example, the

catalytic treating device 17a, which is essentially similar to the device described above with reference to Figures 1 to 3, is carried by an arm comprised of sections 29, 30 and 31, which are extensible and retractable in telescopic fashion, permitting both disposition of the treating device over any one of the surface elements 12a, and retraction of the device within a tubular housing 32 located on the back wall of the range. In this embodiment the legs 19a, which support the device in use, are swingable to a retracted position shown in full lines in Figure 4 in order that the device 17a may be moved downwardly and be disposed adjacent to the back wall of the range. When the device is to be put into use, it is pulled upwardly to the position shown in broken lines in Figure 4, an up-standing base 33 being provided, and having a lower flange 34 which cooperates with an inturned lip 35 formed about an opening provided at the upper end of the housing 32. As is apparent from the drawing, the treating device may then be swung downwardly about the pivot 36, and may be moved laterally across the range by virtue of the freedom for swinging movements which is afforded by the free mounting of base section 33 in housing 32.

In the embodiment of Figure 6, the treating device 17b is carried by an arm comprising articulated sections 37, 38 and 39, the latter of which is pinned for swinging movement upon a fixed stud 40. Evidently, and as will be understood by reference to Figure 6, a mounting of this kind affords freedom for movement of the device 17b across the surface of any one of the heating elements 12b and also permits the device to be disposed in a storage or rest position adjacent the splashguard 13b.

From the foregoing description it will be understood that the present invention provides novel and highly advantageous apparatus useful in eliminating smoke and odors and, particularly, in eliminating the objectionable components of vapors generated during cooking operations.

While the invention has been described with reference to several preferred embodiments thereof, it is to be understood that the disclosed apparatus is susceptible of various changes and modifications without departing from the essential spirit of my invention. For example, it will be evident that the hood need not necessarily be utilized and that the coils may be mounted in a transparent base sheet to facilitate inspection of the contents of the cooking vessel.

Further, although it is a primary objective of the invention to provide vapor treating apparatus in novel combination with a cooking range, it will be understood that, in the broader aspect of the invention, the treating device per se is not limited in applicability to use in conjunction with cooking equipment. In this regard it will be evident that the treating device could be used with other appliances, for example in conjunction with the small unitary frying and broiling devices which are now available. Still further it will be appreciated that use of the device over the outlet of a cooking or broiling oven will result in elimination of smoke and odors emanating from the oven and that, if the device be used with gas burning equipment, complete combustion of the gas is promoted to such an extent that there is no possibility of the release of carbon monoxide. In this latter connection it is to be noted that use of the device with gas burning equipment also results in removal of smoke and odors generated during burning of the gas. It will be appreciated, however, that such uses, changes, and modifications are contemplated as properly come within the scope of the appended claims.

I claim:

1. Apparatus for purifying vapor arising from cooking vessels, comprising: a passageway structure open at the lower and upper ends thereof and providing a short and generally upward path; support means for removably mounting the passageway structure in a position spaced

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a short distance above one of said vessels; electrically non-conductive heater support means in said passageway structure; electrical resistance heating means supported on the non-conductive means, extending across said path and effective when energized and when the passage structure is in said position, to maintain a convective flow of air, together with any vapor from the vessel, along said path; means for energizing said heating means; and catalytically active treating means disposed in said passageway structure and distributed across said path, said treating means being heated by said heating means and being effective when so heated to produce catalytic incineration of impurities in said vapor.

2. Apparatus as described in claim 1 wherein the passage structure comprises a lower annular sheet structure, depending below the heating means and larger than the same.

3. Apparatus as described in claim 1 wherein the passage structure comprises an upper hood for promoting said convection flow.

4. Apparatus as described in claim 1 for use in con-

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junction with a cooking range, wherein said support means comprises an arm, secured to the passageway structure, and means for supporting said arm, with the passageway structure thereon, above said range.

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