Nov. 5, 1968 T. R. FIELD 3,409,005

COOKING RANGE WITH RETRACTABLE VENTILATING FLUE

Filed Dec. 19, 1966

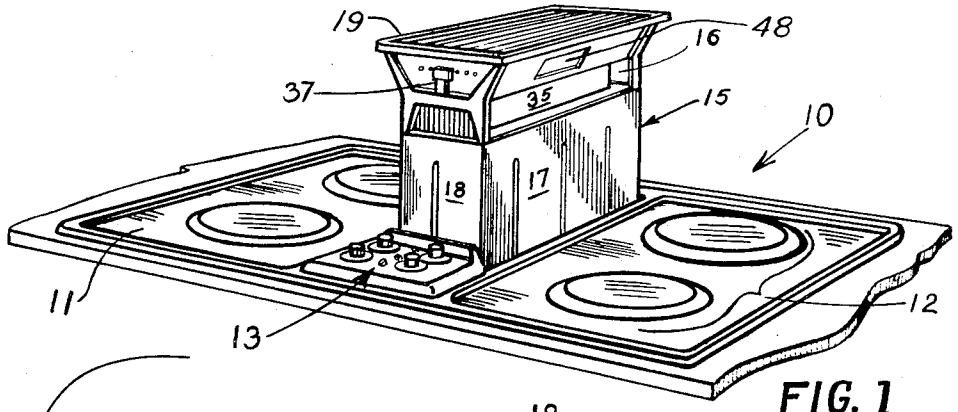
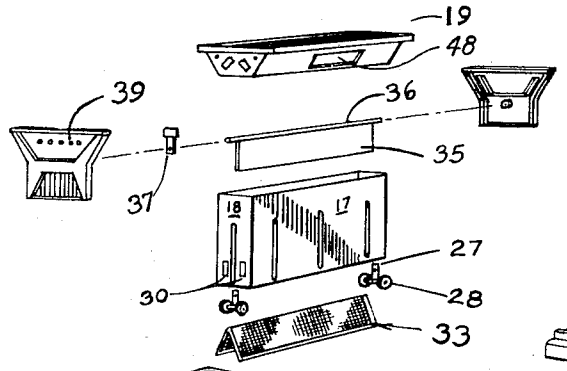
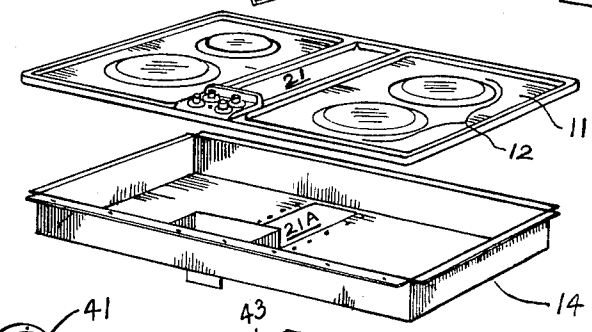


FIG. 1





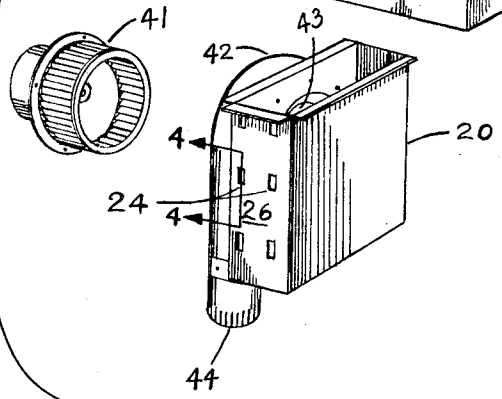


FIG. 3

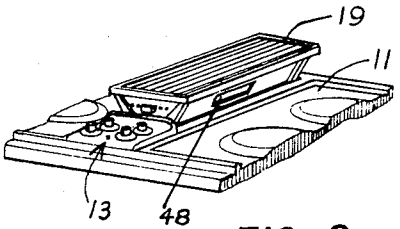


FIG. 2

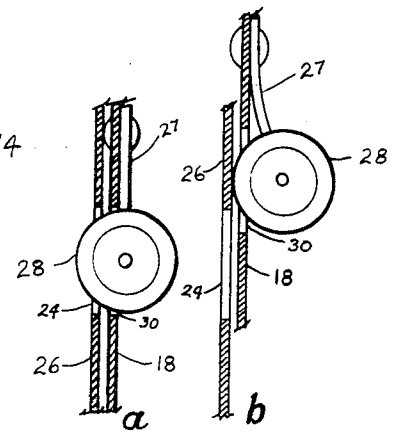


FIG. 4

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COOKING RANGE WITH RETRACTABLE VENTILATING FLUE

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ABSTRACT OF THE DISCLOSURE

An apparatus for capturing and exhausting cooking heat and vapors occurring from cooking on a range top. A telescoping flue communicating with an exhaust fan extends upwardly from the range top with its inlet opening adjacently spanning the airspace immediately above the cooking area on the range top and in a close proximity to the point of occurrence of the heat and vapors resulting from cooking taking place on the range.

Background of the invention

The present invention relates generally to power driven ventilating systems for the removal of grease laden vapors produced as a result of range top cooking, and it is the general object of the invention to provide an improved and altogether satisfactory ventilating system of the character of that disclosed in U.S. Patent No. 2,674,991, to Harold W. Schaefer.

In the Schaefer Patent, there is disclosed a cooking range of the household type provided with a round, closed top flue located in a generally central position among the surface heating elements of the range. This flue is disclosed as being provided with a generally circumferential inlet opening just below its closed top and it is normally maintained in a retracted or stored position with its top being substantially flush with the top or work surface of the range.

When cooking is taking place over any of the heating elements, the flue is raised whereby its inlet opening is positioned adjacent to and preferably slightly above the top edge of the cooking vessel in order that cooking vapors occuring from food being cooked in the vessel may be drawn through the inlet opening and into the flue by a power driven fan housed beneath the range top.

While the apparatus of the Schaefer Patent has utility for the purpose heretofore mentioned, the flue structure disclosed therein has been found to be highly inefficient in actual operation. This is due primarily to the fact that the ability to effectively capture and remove cooking smoke and vapors by drawing in a constant volume rate of air through an inlet, falls off at a rate approximately that of the square of the distance from the inlet opening.

Thus, when the flue structure disclosed by Schaefer is used in conjunction with a range top of the type having a plurality of aligned heating elements thereon, only the cooking smoke and vapors directly above the heating elements located immediately adjacent to the flue can be effectively captured and removed, without having to resort to an oversized and prohibitively expensive blower unit which would also be proportionately louder in operation.

Additionally, the elongated chamber supporting the flue and housing the filter in the Schaefer patent occupies considerable space beneath the cooking surface and consequently does not lend itself to a built-in installation in a kitchen counter top or a free standing unit with an oven located below the range surface.

Summary of the invention

Accordingly, it is a principal aim of the present invention to provide an improved retractable integral ventilating system for cooking range tops which effectively captures and removes smoke, fumes, heated air and airborne grease occurring from cooking on the range, at a close proximity to their occurrence.

A collateral object of the invention is to provide a retractable ventilating system for cooking range tops which will significantly reduce the space taken up beneath the range surface by a filter housing and its associated ductwork.

Still a further object of the invention is to provide an apparatus of the type referred to which captures and removes cooking vapors at a higher degree of efficiency than has been heretofore obtained in devices of this type.

Description of drawing

Other objects and advantages of the invention will appear from the following description taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a perspective view of an exemplary apparatus embodying the features of the present invention here depicting a counter top range having its ventilating flue in an extended position;

FIGURE 2 is a fragmentary perspective view similar to a portion of FIGURE 1, but here showing the ventilating flue in the fully retracted or stored position;

FIGURE 3 is an exploded perspective view of the counter top range illustrated in FIGURE 1 additionally showing the structure located beneath the counter top; and

FIGURE 4 is a pair of fragmentary sectional views both taken generally on the line **4—4** with the structure of FIGURE 3 depicted in an un-exploded condition; view **4***a* taken with the flue of the exemplary apparatus in a fixed raised position and view **4***b* taken with the flue between two fixed positions.

While particular embodiments of the present invention are shown in the drawing and will herein be described in detail, it is apparent that changes and modifications may be made without departing from this invention in its broader aspects, and therefore the aim in the appended claims is to cover such changes and modifications as fall within the true spirit and scope of the invention.

Description of the preferred embodiment

With initial reference to FIGURES 1 and 3, the numeral **10** designates a counter top type of cooking range including a surface plate **11**, a burner box **14**, and two elongated spaced series each comprising a plurality of aligned heating elements with each series being indicated by reference numeral **12**.

A control cluster generally indicated at **13** is also provided in order to operate the heating elements. While the illustrated embodiment depicts each series **12** as being comprised of the conventional round gas or electric type of heating elements, it is understood that an entire series **12** or any individual heating element therein could also be in the form of a grill, griddle, recessed vat or the like and still be in keeping with the broad scope of the invention. It is further understood that the counter top type of range is illustrated by way of example only, and that this invention is equally adaptable to other types of range construction such as free standing.

In accordance with one of the important aspects of the present invention, provision is made for effectively capturing vapors, given off as a result of food being cooked on the range **10**, at a close proximity to their occurrence. This is accomplished by providing the range with an exhaust flue which is capable of being positioned with its inlet openings adjacently spanning the air space directly above food cooking on any heating element in either series **12**. As best shown in FIGURE 1, the flue, generally indicated at **15**, is positioned between the two

series **12** of heating elements, and is formed in a generally rectangular configuration defined by a pair of longitudinal sidewalls **17**, each of which being paralleled and adjacent to one of the respective series **12** of heating elements, a pair of transverse sidewalls **18**, a cover **19** closing its top, and a pair of inlet openings **16**, each opening spanning the length of the series **12** of heating elements adjacent thereto. As best seen in FIGURE 1, the inlet openings **16** are provided at the upper portion of each longitudinal sidewall **17**, and in the exemplary apparatus, they are of the high velocity slot type as taught by U.S. Patent 3,102,533 to L. J. Jenn et al. Thus it will be appreciated that the operation of the present invention, the grease laden cooking vapors occurring above each series **12** of heating elements are drawn directly and smoothly through the inlet openings **16** and into the flue **15**, rather than converging into the relatively small and remote opening disclosed by Schaefer resulting in a large portion of the vapors escaping to the kitchen.

In order to capture and remove cooking vapors and smoke at a close proximity to their occurrence, provision is made to position its inlet openings **16** of the flue **15** in a plurality of preselected raised positions corresponding to the heights of various cooking vessels and food cooking on a grill or griddle, and to further allow the flue **15** when not in use to be stored in a position wherein its cover **19** is substantially flush with the range surface **11** as depicted in FIGURE 2. This is accomplished by the provision of a pair of aligned apertures **21** and **21***a* (FIGURE 3) in the surface plate **11** and burner box **14** respectively, and a plenum housing **20** sized to slideably receive the portion of the flue **15** depending from aperture **21** and passing through aperture **21***a*. To positively position the inlet openings **16** at the preselected series of heights, each transverse sidewall **26** of the plenum housing **20** is provided with a series of vertically spaced pairs of detents **24**, the spacing corresponding to a series of selected heights for the inlet openings **16**. At the lower inside portion of each transverse wall **18** of the flue **15**, a spring steel bracket **27** carrying a pair of rollers **28** is mounted in a manner whereby the rollers project through a corresponding pair of apertures **30** which are provided in each transverse sidewall **18** and, as best seen in FIGURE 4*a*, when the flue **15** is slideably engaged by the plenum housing **20** the projecting portion of the rollers **28** are adapted to engage each pair of detents **24** in both transverse sidewalls **26** of the plenum housing **20**.

When it is desired to raise or lower the flue **15** in order to store it in a retracted position with its cover **19** flush with the range surface **11**, or to position its inlet openings **16** in one of the aforesaid series of heights, one merely has to grasp the cover **19** and raise or lower the flue **15** until the two pairs of rollers **28** engage the pairs of detents **24**, best corresponding to the position desired. It is also to be noted with reference to FIGURE 4*b*, that the rollers **28** are by virtue of the spring steel bracket **27**, maintained in contact with the transverse sidewall **26** of the plenum housing **20**, thus providing a guide to prevent the flue **15** from binding, or the like, when being raised or lowered.

In keeping with the objects of the invention, a filter is provided to capture the airborne matter drawn into the inlet openings **16** of the flue **15**. Referring to FIGURE 3, the filter **33** is carried within the flue **15** thereby disposed in the path of all air transversing therein, and it is formed in a V-shaped cross section which provides a greater filtering area. It is recognized that by disposing the filter within the flue **15** in this manner, the need for a space consuming filter housing in the ductwork beneath the range is eliminated. Additionally, to obtain access to the filter for cleaning purposes, all that is necessary, as seen in FIGURE 3, is to remove the flue **15**, which can easily be accomplished from above the range.

In order to draw the aforesaid cooking vapors and smoke into the inlet openings **16**, a power driven fan **41** is provided. As seen in FIGURE 3, the fan scroll **42** is mounted adjacently to an opening **43** in the longitudinal sidewall **25** of the plenum housing **20**, said opening **43** defining the inlet opening of the scroll **42**. The fan **41** may be activated by any suitable means such as a switch (not shown) on the control cluster **13** or in conjunction with the energenation of any heating element.

In a conventional installation, it is contemplated that the outlet opening **44** of the fan scroll **42** will be ducted to the outside of the kitchen. It is understood however, that if so desired, it would be in keeping with the broad aspects of the invention to discharge the air back into the kitchen after it is filtered.

In accordance with another important aspect of the present invention, provision is made for selectively apportioning the intake capacity of the fan **41** between each inlet opening **16**. The purpose of this feature is to provide increased vapor capture ability to one of the two series **12** of heating elements in the situation where only one series is producing an excessive amount of cooking vapor relative to the other. To this end, a damper blade **35** is positioned between the inlet openings **16** inside the upper portion of the flue **15** on a rotatably mounted shaft **36** which is rotated by lever **37** located on the outside of the flue. To set the damper blade **35** in a desired position, any number of known methods are available. For convenience of illustration however, a series of detents **39** are provided on the transverse flue wall **18** which cooperate with a projection (not shown) provided on the lever **37**.

Provision is also made for providing illumination to both series **12** of heating elements. To accomplish this, a light fixture (not shown) is provided in the upper inside portion of the flue **15** above the inlet openings **16**. As shown in FIGURE 1, a pair of translucent lenses **48** are provided in the longitudinal sidewall **17** to direct the light. It will be noted that when the flue **15** is in its retracted position (FIGURE 2) the lenses **48** are positioned above the range surface and thus still capable of providing illumination. In order to energize the light, a switch (not indicated) can be provided at the control cluster **13**.

Having thus described my invention, I claim:

1. For use with a cooking range of the type having a horizontal surface and an elongated series of substantially aligned heating elements positioned thereon for cooking purposes, the combination thereof with apparatus for removing airborne matter such as smoke and grease laden vapors resulting from cooking on the range, said apparatus comprising a flue extending upwardly from said horizontal surface, said flue including a generally vertically disposed sidewall positioned adjacent to said series of heating elements and extending substantially the length thereof, means defining an elongate intake aperture at an upper portion of said sidewall through which air and airborne matter may pass from the exterior to the interior of said flue, said air intake aperture being generally horizontal and parallel to the alignment of the heating elements in said series and substantially spanning the airspace directly overlying each heating element in said series, said flue extending through the horizontal surface of the range to the underside thereof, means positioned beneath said horizontal surface supporting said flue in a manner whereby it can be retracted to a stored position wherein the upper portion of said flue is proximate to said horizontal surface and the remaining portion of said flue is below said horizontal surface, and power driven air moving means communicating with said intake means where upon actuation thereof, the air and airborne matter present in the airspace overlying each heating element in said series is drawn through said intake aperture and into said flue.

2. The apparatus as set forth in claim **1** wherein said flue supporting means includes means whereby said inlet means may be positively disposed at any one of a plurality of preselected vertically raised positions.

3. The apparatus as set forth in claim 2 wherein said flue is formed with a pair of apertures in the lower portion thereof, spring biased rollers mounted within said flue and each partially projecting through one of said lower flue apertures, said flue support means having a series of vertically spaced detents corresponding to the plurality of preselected raised positions for said flue, and said rollers being adapted to engage said detents when said flue is in a preselected vertically raised position to positively hold said flue in position.

4. For use with a cooking range of the type having a horizontal surface and two elongated, spaced series of substantially aligned heating elements positioned thereon for cooking purposes, the combination thereof with apparatus for removing grease laden vapors resulting from cooking, said apparatus comprising a vertically directed closed top flue of a generally rectangular cross-section, said flue including a pair of longitudinal sidewalls, a pair of transverse sidewalls, and a cover sized to close the top thereof, said flue disposed between said two series of heating elements in a manner whereby each said longitudinal sidewall is juxtaposed to a respective one of each of said series of aligned heating elements whereby each said longitudinal sidewall is adjacent to and generally parallel with the alignment of its respective series, and substantially extends the length thereof, means defining an elongate intake aperture at an upper portion of each said longitudinal sidewall, said intake aperture being generally horizontally directed to substantially span the airspace overlying each heating element in the series adjacent thereto, said flue extending through said horizontal surface to the underside thereof, means positioned beneath the horizontal surface supporting said flue in a manner permitting movement thereof between a retracted position wherein said cover is proximate to said horizontal surface and at least one extended position wherein said intake aperture is disposed above the horizontal surface and capable of receiving the grease laden vapors in the immediate proximity of their occurrence, and power driven air moving means communicating with said flue whereupon actuation thereof, the aforesaid grease laden vapors are drawn through said intake aperture and into said flue.

5. The invention as set forth in claim 4 further comprising dampering means disposed within said flue whereby the intake capacity of said air moving means can be selectively apportioned between each said aperture.

6. The invention as set forth in claim 5 wherein said dampering means comprise a damper blade longitudinally disposed within said flue between each said aperture, said blade communicating with control means located externally of said flue whereby said damper blade may be disposed in a plurality of positions.

7. The invention as set forth in claim 4 further including filter means disposed within said flue below said intake aperture, said filter means sized and positioned in a manner whereby the grease laden vapors drawn into said flue will pass therethrough.

References Cited

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2,674,991	4/1954	Schaefer	126—299
3,102,533	9/1963	Jenn et al.	126—303

FREDERICK L. MATTESON, JR., *Primary Examiner.*

E. G. FAVORS, *Assistant Examiner.*