March 17, 1970 G. E. OPDAHL 3,500,813

SPATTER CONTROL APPARATUS FOR RANGES

Filed Sept. 11, 1968 2 Sheets-Sheet 1

FIG. 1

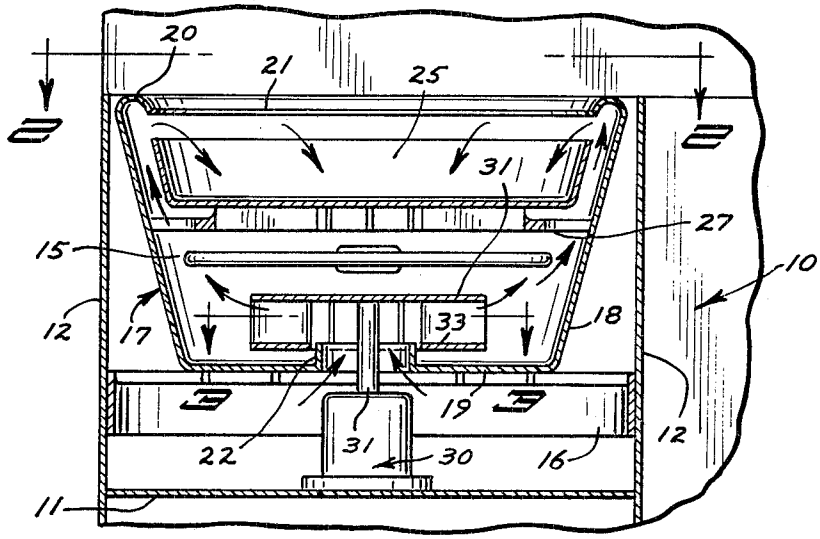
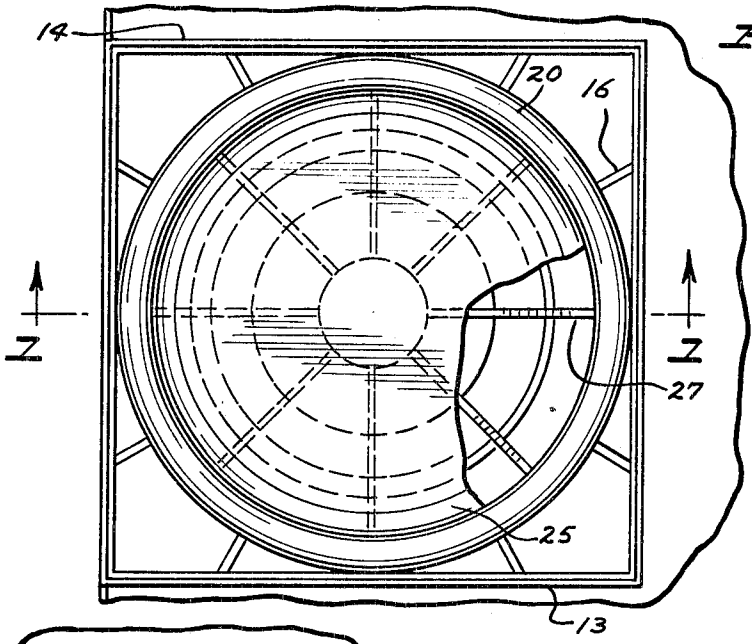


FIG. 2



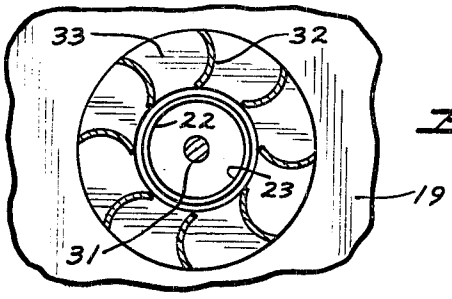


FIG. 3

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SPATTER CONTROL APPARATUS FOR RANGES

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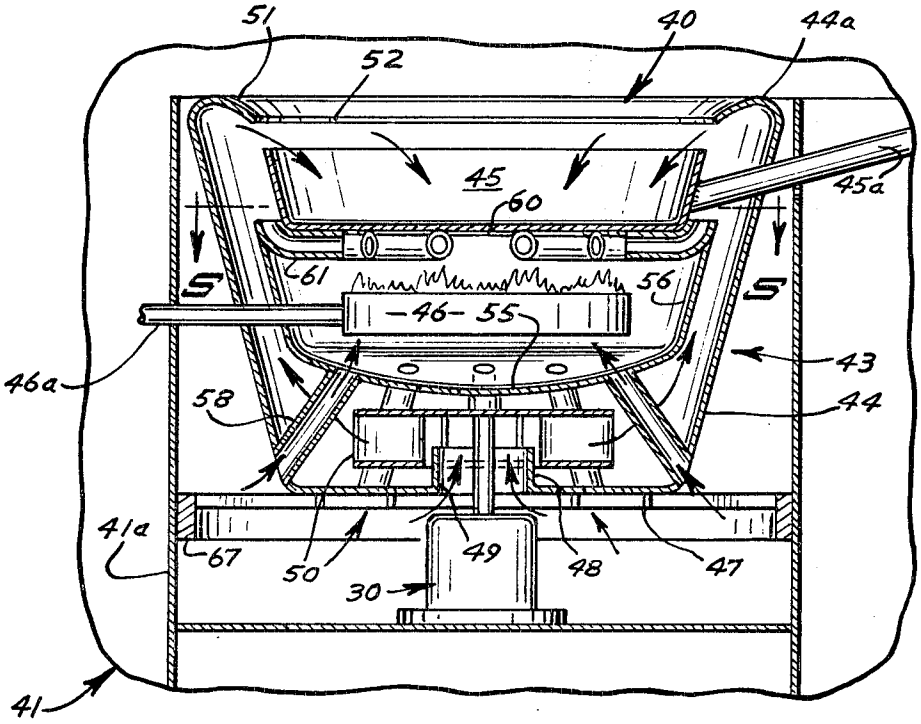


FIG. 4

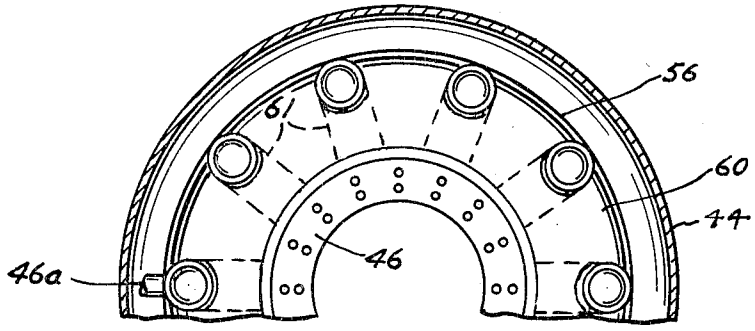


FIG. 5

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United States Patent Office 3,500,813
Patented Mar. 17, 1970

3,500,813

SPATTER CONTROL APPARATUS FOR RANGES

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Filed Sept. 11, 1968, Ser. No. 759,063
Int. Cl. F24c *15/12, 3/00, 15/20*
U.S. Cl. 126—39 10 Claims

ABSTRACT OF THE DISCLOSURE

Spatter control apparatus for electric and gas ranges that includes a baffle member extending around the pan to be heated on a range heating element and having a deflector portion for directing the flow of gas downwardly into the pan. A fan forces air between the pan and baffle member at a sufficiently high velocity to direct most of the spatters back into the pan. In one embodiment, no structure is provided between the fan wheel and the heating element, while in the gas range embodiment there is provided a second baffle member between the pan and fan.

BACKGROUND OF THE INVENTION

Spatter control apparatus for electric or gas ranges that includes a fan beneath the heating element and a baffle for directing a flow of air induced by the fan upwardly between the baffle member and the pan and thence downwardly into the pan.

In the prior art, various types of kitchen hoods, with or without fans have been provided above the stove for drawing off the vaporized greases and etc. that result during the frying of foods. However, such prior art apparatus has not provided satisfactory for eliminating spattering of hot greases or preventing the hot grease spatters from landing on the stove in areas surrounding the heating element and on other equipment. Additionally, at times the hot grease spatters move outwardly of the periphery of the pan, ignite and result in a fire. In order to control the spatters of hot grease and etc. during a cooking or frying operation, this invention has been made.

SUMMARY OF THE INVENTION

Spatter control apparatus for an electric or gas range that includes a fan below the heating element, and a baffle member for directing the flow of air resulting from the operation of the fan upwardly along the side of the pan and thence downwardly into the pan for directing spatters back into the pan. For a gas range, a second baffle member is provided intermediate the burner and the fan to prevent the flow of air induced by the fan substantially interfering with the gas flame of the burner; and conduits are provided for conducting air exterior of the first baffle member to adjacent the burner and structure is provided to permit the exhaust of the gases adjacent the burner into the area between the first baffle member and the pan.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a vertical cross sectional view generally taken along the line and in the direction of arrows **1—1** of FIGURE 2 to illustrate the first embodiment of the invention;

FIGURE 2 is a fragmentary plan view of a range, said view being generally taken along the line and in the direction of the arrows **2—2** of FIGURE 1;

FIGURE 3 is a fragmentary horizontal cross sectional view generally taken along the line and in the direction of the arrows **3—3** of FIGURE 1 to show part of the fan members and the relationship thereto relative the inlet opening of the baffle member;

FIGURE 4 is a view similar to that of FIGURE 1 other than it illustrates a second embodiment of the invention; and

FIGURE 5 is a fragmentary horizontal cross sectional view generally taken along the line and in the direction of the arrows **5—5** of FIGURE 4 to more clearly illustrate the structure for exhausting gases from adjacent the burner, said view not showing the pan.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in particular to FIGURES 1–3, there is illustrated a portion of an electric stove generally designated **10** that includes a vertically intermediate panel **11**, side panels **12**, a front panel **13**, and a rear panel **14** to form a well in which the apparatus to be described is located. Within the aforementioned well there is located an electric heating element **15** of conventional construction, the leads for supplying power to the heating element and the member for supporting the heating element in a vertical condition relative the bottom panel not being illustrated.

Located within the aforementioned well is a first baffle member, generally designated **17** that includes an annular, generally vertically extending wall portion **18**. Wall portion **18** extends to a higher elevation than the pan **25** that is to be heated by the element **15** and to a substantially lower elevation than said element. The part of the wall portion **18** horizontally adjacent the pan is horizontally spaced from the pan side wall to provide an annular clearance space. The baffle **17** also includes a bottom wall **19** having a peripheral edge integrally joined to the lower edge of wall **18**, and is supported on appropriate support member **16** that is appropriately secured to one or more of the walls **12–14** at a substantial elevation above the panel **11**. Integrally joined to the inner peripheral edge of the bottom wall **19** is an upright annular flange **22**, flange **22** defining an inlet opening **23** that is generally centrally located relative the heating element and therebeneath. Integrally joined to the upper edge of the wall **18** is a curved generally annular deflector portion **20** that in vertical cross section first curves upwardly and horizontally inwardly, and thence is reversely curved to extend inwardly in a downward direction. The deflector portion **20** has an inner peripheral edge **21** of a sufficiently large diameter to permit the pan **25** being moved therethrough, edge **21** being at a higher elevation than the top edge of the pan. Further, it is to be mentioned that the curvature of the deflector portion is such that air inflowing upwardly between the pan and wall portion **18** will be deflected downwardly into the interior of the pan. The baffle member **17** has an opening (not shown) for the leads and the support (not shown) for element **15** to extend through, such an opening forming a close fit with the leads and support.

For supporting the pan above the element **15**, advantageously there is provided a spider support member **27** that is mounted within and by baffle member **17** at a higher elevation than the burner.

Mounted on the panel **11** is a fan, generally designated **30**, having a conventional motor that includes a motor shaft **31**. The motor shaft extends upwardly through the opening defined by the flange **22** and its upper end mounts the flat plate **31** of the fan wheel. The fan wheel includes a plurality of vanes **32** and an annular plate **33** joined to the edges of the vanes opposite plate **31**. As may be noted from FIGURE 1, the flange **22** extends upwardly into the annular plate **33** so that substantially all the air drawn into the inlet **23** is forced radially outwardly by the vanes intermediate plates **31, 33**. Even though a particular type of fan has been described, it is to be understood that other type fans can be utilized as long as the flow of air through

the baffle member is at a sufficiently high velocity to direct the grease spatters back into the pan.

Using the first embodiment of the invention, the pan **25** sits on the support **27** above the heating element, and the power to the heating element and the fan are turned on. As a result, air is drawn from exterior of the baffle member **17** to pass upwardly through the inlet **23**, thence through the fan wheel, then outwardly to flow upwardly along the wall portion of the baffle member in the annular clearance space between said baffle member and the pan, and thence be deflected downwardly by the portion **20** toward the interior of the pan. As a result, substantially all of the spatters that tend to move upwardly above the upper edge of the pan are directed back down into the pan.

Referring now to FIGURES 4 and 5, the second embodiment of the invention, generally designated **40**, is utilized with a gas range, generally designated **41**. The gas range has a well **41***a* that may be of the same construction as that described with reference to the first embodiment. Located within the well is a baffle member generally designated **43** that is supported by member **67** that is mounted on the panels defining wall **41***a*. The baffle member **43** includes a generally annular vertically extending first wall portion **44** that has an upper edge located at a higher elevation than the upper edge of a pan **45** that is to be heated by the gas burner (heating element) **46** of the range. The wall **44** extends to a lower elevation than the burner and has its lower edge integrally joined to the outer peripheral edge of the annular boom wall **47**. The inner edge of the bottom wall is joined to the lower edge of an upright flange **48**, flange **48** extending upwardly into the fan wheel of the fan **30** in a manner similar to that described with reference to the first embodiment. A generally annular deflector **51** has its outer edge joined to the upper edge of the wall portion **44** and has an inner peripheral edge **52** that is of a greater diameter than the maximum diameter of the pan **45** whereby the pan may be readily moved through the aperture defined by edge **52**. Deflector portion **51** in vertical cross section is curved to extend first upwardly and inwardly, and thence downwardly and inwardly so as to direct the air passing between the annular space defined by the pan and the adjacent part of wall **44** down into the interior of the pan.

In order to prevent the operation of the fan **30** from interfering with the flame of burner **46**, there is provided a second baffle member having a bottom wall portion **55** vertically intermediate the fan wheel and the burner, the diameter of the bottom wall portion preferably being substantially larger than the diameter of the fan wheel and the diameter of the burner. The second baffle member also includes a vertically extending wall **56** that has its lower edge joined to the outer edge of the wall **55** and that has an upper edge at a higher elevation than the bottom of the pan **45**.

In order to mount the second baffle member **55**, **56** within the first baffle member **17**, and to permit the free flow of air to the interior of the second baffle member, there are provided a plurality of conduits **58** that at their outlet ends are attached to the second baffle member and at their inlet ends to the baffle member **17**. Conduits **58** at their inlet ends open to the well exterior of the baffle member **53** at a location sufficiently spaced from aperture **49** defined by flange **48** to minimize the likelihood of the fan drawing air through the conduits. The outlet ends of the conduits open to the interior of the second baffle member vertically adjacent the periphery of the burner. As may be in part noted from FIGURE 4, the conduits **58** are circumferentially spaced around the fan wheel.

Joined to the upper edge portion of wall **56** is a generally horizontal annular plate **60** for supporting the pan vertically above the flame of the gas burner. A plurality

of circumferentially spaced exhaust conduits **61** at their one ends open to the interior of the second baffle member vertically adjacent the outer peripheral edge of the gas flame, and at their opposite ends open upwardly along the side wall of the pan **45**. The conduits **61** are attached to the plate **60**, and are provided for exhausting gas from the chamber formed by the second baffle member, plate **60** and the pan, said chamber being enclosed other than for the conduits opening thereto. Since the outlets of the conduits **61** open upwardly, the exhaust gas flows upwardly along with the air flow resulting from the operation of the fan **30**. The conduits **58** and **61** are of diameters and in sufficient number to provide adequate flow of air for supporting the combustion of gas from the gas burner.

The gas burner **46** may be supported by a pipe **46***a* (or other structure) that extends through appropriate apertures in the first and second baffle members, pipe **46***a* also supplying gas to the burner. In using the apparatus of the second embodiment, burner **46** is turned on, pan **45** placed on plate **60** above the burner, and power to the fan **30** turned on. As the gas flame burns, air passes through conduits **58** to adjacent the burner, while the exhaust gases flow outwardly to the conduits **61**. Further, the fan **30** causes flow of air through the aperture **49**, thence upwardly through the annular space between walls **56**, **44**, thence further upwardly through the annular space between the pan side wall and wall **44**; and thence deflected downwardly into the pan by deflector portion **51** to force spatters back into the pan **45**.

Advantageously, both the embodiments of the invention may have a notched out portion provided in the deflector member and the adjacent vertical baffle wall portion such as shown by notched out portion **44***a* of the second embodiment in the event the pan has an elongated handle extending outwardly in a generally horizontal direction. The notched out portion is of a size to permit the handle **45***a* of the pan **45** extending outwardly therethrough, and of a horizontal width slightly greater than the corresponding dimension of the handle. Also to be mentioned is that the lower end portions of the baffle members **17**, **43** may be of a more rounded bowl shape than illustrated in the drawings, for example, such that there would be no sharp break between the bottom wall and the generally vertically extending wall as illustrated. However, an important feature of the invention is that the deflector portion be curved to deflect the flow of air at least at a slight angle in a downward direction. Otherwise, the spatters would not be directed back into the pan.

Also to be mentioned is that either supports **16**, **47** or the range walls have openings therethrough to permit the flow of air adjacent the fan motor. As illustrated, the supports have openings horizontally between the baffle members and the vertical walls of the range wells, and the vertical extending walls of the baffle members **17**, **43** are spaced from the vertical walls of the range walls so that air may flow downwardly to adjacent the fan.

In using the apparatus of this invention, a pan was provided above an electric burner having a baffle member such as illustrated in FIGURE 1, the pan partially filled with grease, and after the grease was boiling hot, a small clump of snow was dropped into the grease. This resulted in a loud noise, however, no grease spatters appeared on paper that was placed in horizontal surrounding relationship to the burner.

What is claimed is:

1. For directing spatters back into a pan being heated on a heating element of a stove, the combination of a baffle member having a first wall portion extending around said heating element, and extending to a higher elevation than the pan being heated by the heating element and to a lower elevation that the heating element, said first wall portion having an upper peripheral edge and a lower peripheral edge, a bottom wall portion having a peripheral

edge joined to said first wall portion lower edge, and being at a lower elevation than said heating element, said bottom wall portion having an inlet opening, and peripheral deflector means for directing gas that flows through said inlet opening and between the pan and first wall portion into the pan, said deflector means having a central opening of a larger size than the pan to permit the pan being passed therethrough and a peripheral edge joined to said first wall portion upper edge, and rotary fan means for producing a flow of gas through said inlet opening and up along the first wall portion at a sufficiently high velocity to direct spatters into the pan.

2. The apparatus of claim 1 further characterized in that said fan means comprises a fan blade located vertically between the burner and bottom wall portion, motor means at a lower elevation than the bottom wall portion, and first means for drivingly connecting the motor means to the fan blade.

3. The apparatus of claim 2 further characterized in that said baffle member includes an upright flange surrounding the inlet opening and having an upper edge, and that the fan means comprises an annual plate having a central opening of a larger dimension than said flange, said annular plate being at a lower elevation than the flange upper edge and having the flange extended into its central opening, and that said first means includes a plate, said blade extending between and being joined to said plates.

4. The apparatus of claim 1 further characterized in that a pan support member is mounted by the baffle member above the heating element.

5. The apparatus of claim 1 further characterized in that there is provided baffle means intermediate the fan means and the heating element for directing the flow of gas from the inlet away from the heating element and conduit means opening through the baffle member and baffle means for conducting gas from exterior of the baffle member to adjacent the burner.

6. The apparatus of claim 5 further characterized in that the baffle means comprises a somewhat bowl shaped plate having a peripheral edge horizontally intermediate the first wall portion and the pan being heated by said heating element and at a higher elevation than the burner.

7. The apparatus of claim 6 further characterized in that there is provided exhaust means for supporting the pan and conducting gas away from the heating element and to the space between the first wall portion and the pan, said exhaust being mounted by the baffle means.

8. For an electric or gas range having a heating element to control spattering from a pan being heated by said heating element, spatter control apparatus comprising a baffle member having a first wall portion extending around the pan and horizontally spaced therefrom, said first wall portion extending to a lower elevation than the heating element and to a higher elevation than the

pan, said first wall portion having an upper edge, and a deflector portion having one edge joined to said first wall portion upper edge and a terminal edge of a smaller diameter than said one edge and of a larger diameter than the pan, said deflector portion being curved downwardly to direct a flow of gas into the interior of the pan, first means for causing a flow of air upwardly between the first wall portion and the pan and thence be deflected by the deflector portion to direct spatters back into the pan.

9. The apparatus of claim 8 further characterized in that the first means includes a fan vertically below the heating element, and that there is provided a second baffle member having a second wall portion between the fan and the heating element and a third wall portion having a lower edge joined to the second wall portion and extending upwardly to a higher elevation than the heating element, said third wall portion being located horizontally between the heating element and the first wall portion and extending around the heating element and conduits having inlets opening through the first mentioned baffle member and an outlet opening through the second baffle member for conducting air from exterior of the first mentioned baffle member to adjacent the heating element, and means for conducting gases away from the heating element and discharging gases in a generally upward direction intermediate the pan and the first wall portion.

10. For an electric range having a heating element to control spattering from a pan being heated by said heating element, spatter control apparatus comprising a baffle member having a first wall portion extending around the pan and horizontally spaced therefrom, said first wall portion extending to a lower elevation than the heating element and to a higher elevation than the pan, said first wall portion having an upper edge, and a deflector portion having one edge joined to said first wall portion upper edge and a terminal edge of a smaller diameter than said one edge and of a larger diameter than the pan, said deflector portion being curved downwardly to direct a flow of gas into the interior of the pan, and fan means for causing an upward flow of air between the pan and first wall portion and along the deflector portion at a sufficiently high velocity to direct spatters back into the pan being heated by the heating element.

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CHARLES J. MYHRE, Primary Examiner

U.S. Cl. X.R.

126—299

PO-1050
(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,500,813 Dated March 17, 1970

Inventor(s) Gerald E. Opdahl

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 31, "boom" should be --bottom--. Column 5, line 22, "annual" should be --annular--.

SIGNED AND
SEALED
JUL 14 1970

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents