July 20, 1965 A. D. BRITE 3,196,046

PROCESS FOR CLEANING OVENS

Original Filed March 23, 1959 2 Sheets-Sheet 1

FIG. 1.

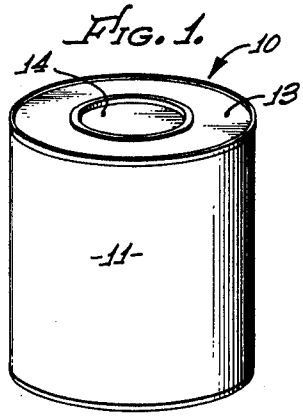


FIG. 2.

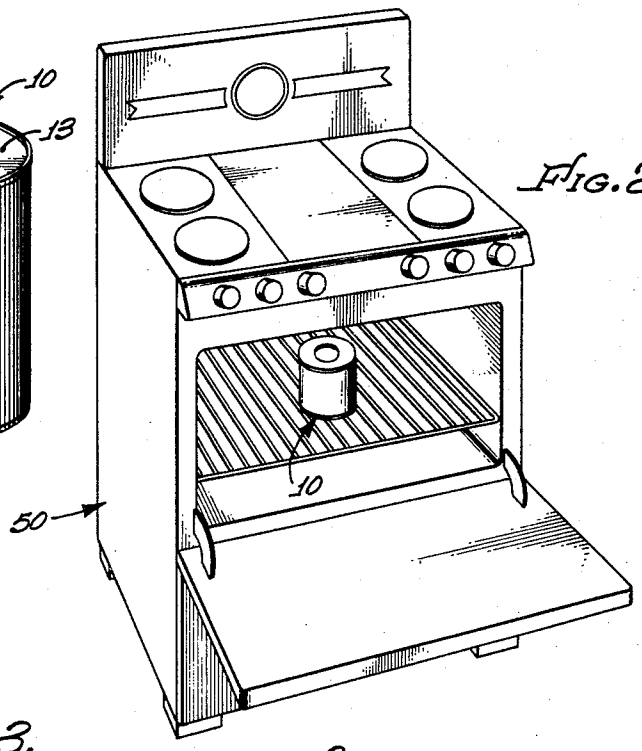


FIG. 3.

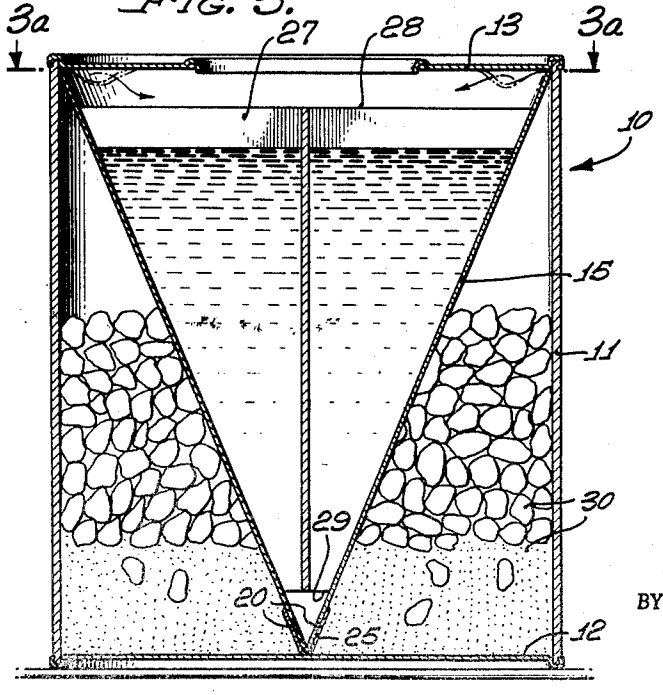
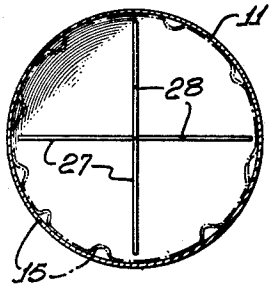


FIG. 3a.



INVENTOR.
ALAN D. BRITE
BY

ATTORNEYS.

July 20, 1965 A. D. BRITE 3,196,046

PROCESS FOR CLEANING OVENS

Original Filed March 23, 1959 2 Sheets-Sheet 2

FIG. 4.

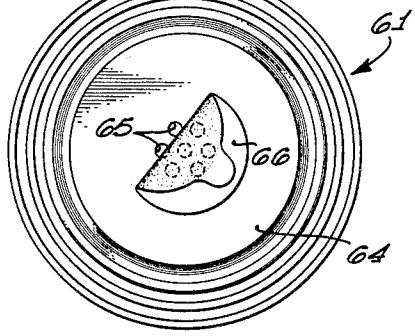
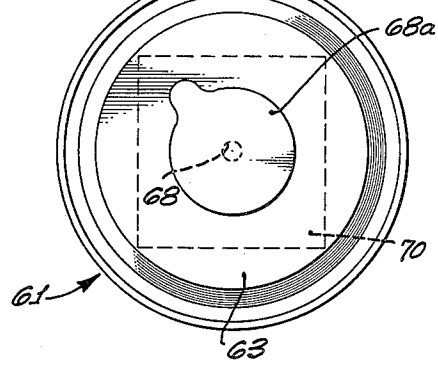


FIG. 5.



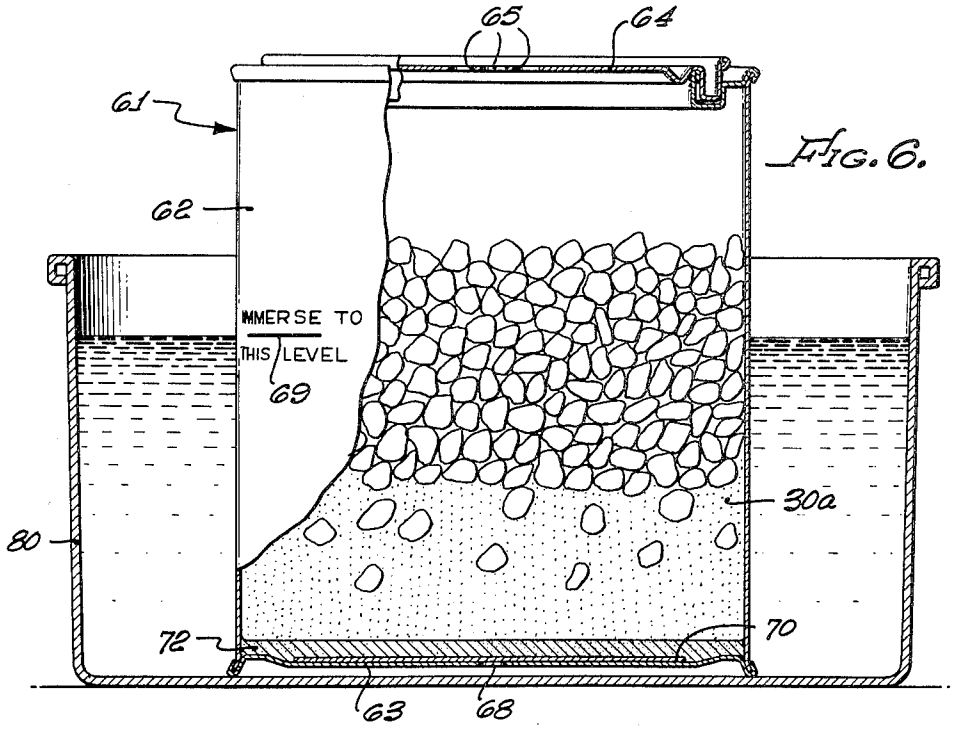


FIG. 6.

INVENTOR.
ALAN D. BRITE
BY

ATTORNEYS.

United States Patent Office 3,196,046 Patented July 20, 1965

3,196,046

PROCESS FOR CLEANING OVENS

Alan D. Brite, 5147 W. Jefferson Blvd., Los Angeles, Calif.

Original application Mar. 23, 1959, Ser. No. 801,355, now Patent No. 3,051,559, dated Aug. 28, 1962. Divided and this application July 20, 1962, Ser. No. 211,356
6 Claims. (Cl. 134—22)

This application is a division of my copending application Serial No. 801,355, filed March 23, 1959, now Patent No. 3,051,559, dated August 28, 1962.

This invention relates to the art of cleaning and has particular reference to a process and article for cleaning grease and food stained surfaces such as those found in household cooking ovens.

One of the most difficult and poorly performed tasks which faces the modern housewife is that of cleaning the soiled interior surfaces of the oven. Many preparations have been devised and sold specifically for this purpose, but all those that are effective to any degree in removing the food and grease stains contain caustic or other corrosive chemicals which are difficult and even dangerous to apply. A primary object of the present invention is to provide a novel process and article for cleaning the interior surfaces of ovens or the like, which are not subject to the above and other disadvantages of the methods and materials heretofore proposed.

Another object of the present invention is to provide a novel article for cleaning ovens and the like, which is non-corrosive, non-toxic, and non-inflammable, yet which is highly effective in use.

Other objects and advantages of this invention it is believed will be readily apparent from the following detailed description of preferred embodiments thereof when read in connection with the accompanying drawings.

Referring now to the drawings:

FIGURE 1 is a perspective view of a preferred form of the article of the present invention.

FIGURE 2 is a perspective view illustrating the article in place in an oven and ready for use.

FIGURE 3 is a vertical sectional view of the article.

FIGURE 3*a* is a sectional view taken substantially on the line 3*a*—3*a* of FIGURE 3.

FIGURE 4 is a top plan view of a modified form of the invention.

FIGURE 5 is a bottom plan view thereof.

FIGURE 6 is a vertical sectional view illustrating the manner of use of the article of FIGURES 4 and 5.

Referring now to the drawings, a preferred form of the article of the present invention is generally indicated **10**, including a generally cylindrical container **11** which may be of metal or formed of resin-impregnated cardboard having a metal bottom **12** and top **13**, the top being provided with a central opening and a closure **14**. Positioned within the container is a cone-shaped cup member **15** formed of resin-impregnated paper or other material suitably treated to render it resistant to cold water. The cup member **15** is open at the top and is provided with a pair of relatively small openings **20** adjacent the bottom or apex thereof, the openings being covered with a plug or layer **25** of a low-melting material such as paraffin wax or the like. The top of the cup member extends just short of the underside of the container top **13** and the apex of the cup member is positioned on the container bottom **12**. Stiffeners or ribs **27** of cardboard or the like are positioned inside the cup member, the top edges **28** thereof extending just short of the upper edge of the cup member and the lower edges **29** of the ribs terminating above the openings **20**.

A chemical mixture **30** is contained in the volume of the container between the outer surface of the cup member and the inner surfaces of the container side wall and bottom. The mixture **30** comprises calcium oxide in lump form and an ammonium salt such as the chloride, sulfate, nitrate, carbonate, etc., in granular or powder form. Preferably the mixture **30** comprises about 400 grams of calcium oxide and 100 grams of ammonium chloride.

As shown in the drawings, the relatively fine ammonium chloride settles to the lower portion of the container, leaving the relatively coarse particles of calcium oxide in the upper portion thereof.

In use of the article, the closure **14** is removed and hot water poured into the cup member **15** to the approximate level indicated in FIGURE 3. The container is then immediately placed in the oven **50** as indicated in FIGURE 2. The oven should be cold and therefore if of the type having a pilot light, the oven door should be left open for almost an hour prior to use of the article of this invention.

After placing the article **10** in the oven, the oven door is closed. The hot water in the cup member melts the wax plug **25**, permitting the water to slowly seep into contact with the ammonium chloride and calcium oxide mixture. Since the bulk of the ammonium chloride is positioned in the lower portion of the container it is first contacted by the water, causing it to dissolve readily. The water progressively moves upwardly through the mixture, contacting the calcium oxide with the usual exothermic reaction, forming steam. Simultaneously, ammonia gas is liberated from the ammonium chloride. The steam tends to soften the upper portion of the cup member and cause it to collapse inwardly as indicated by the phanton lines of FIGURE 3.

The mixture of ammonia gas and steam thus formed rises out of the container opening into the oven and contacts the cold walls thereof, condensing the steam and depositing the ammonia thereon in the form of ammonium hydroxide which exerts its cleaning and dissolving action on the grease and other foreign matter on the oven walls. The reaction is completed in 10–15 minutes and after this period of time the oven door may be opened and the container removed. The oven wall surfaces are then easily wiped clean with a wet cloth or sponge.

A modified form of the invention is illustrated in FIGURES 4, 5 and 6. As shown, the modified article comprises a container **61**, preferably of metal, having a cylindrical side wall **62**, a bottom wall **63** and a top closure **64**. The top closure is provided with a plurality of small openings **65** covered by a removable cover **66** of pressure-sensitive adhesive tape or the like. The bottom wall **63** is provided with a single central aperture **68**, and a similar cover **68***a*. An indicator mark **69** is provided on the outer surface of the side wall **62**.

Resting on the upper surface of the bottom wall **63** is a square sheet **70** of paper or like material, the diagonal dimension thereof being approximately equal to the inside diameter of the cylindrical wall **62**. Overlying the sheet **70** and bottom wall **63** is a layer **72** of paraffin wax or other low melting material. The chemical mixture **30***a*, of the same composition as the mixture **30** described above, fills substantially all of the container above the paraffin layer **72**.

In use of the article of FIGURES 4–6, it is placed in a pan **80** or other suitable container and the pan filled with cold water to the indicator mark **69**. The article is then removed from the pan and the water heated to a boil. The pan and its contained hot water is then placed in the cold oven, the covers **66** and **68***a* are removed from the container top and bottom walls and the article is placed in the pan of hot water. The hot water raises the temperature of the container **61** sufficiently to melt the wax, permitting the water to seep into the con-

tainer through the aperture 68, under the sheet 70 and thence into contact with the mixture 30*a* with the resultant formation of ammonia gas and steam in the same manner and with the same results as described above. It will be seen that the sheet 70 functions as a valve to permit only a relatively slow inflow of water, the outflow of steam and ammonia gas being controlled by the size and number of openings 65.

It is to be understood that the specific proportions of calcium oxide and ammonium salt recited above are not critical and that the proportions may be varied within rather wide limits, so long as sufficient calcium oxide is present to react with the ammonium salt and form the ammonia and steam.

From the above description it will be understood that a novel and highly effective article and process for cleaning ovens and the like has been provided by the present invention. The article is highly effective in use, yet eliminates the disadvantages inherent in the use of conventional cleaning compositions. It will further be understood that a subsidiary, yet important feature of the invention resides in providing the calcium oxide in lump form and the ammonium salt in finer particle size form so that the latter gravitates to the bottom of the container. This, combined with the structure whereby the water is admitted into the bottom of the container so that it first contacts the ammonium salt rather than the calcium oxide, permits most efficient dissolving of the ammonium salt and utilization of the steam produced by the slaking of the calcium oxide.

Having fully described my invention, it is to be understood that I do not wish to be limited to the details set forth, but my invention is of the full scope of the appended claims.

I claim:

1. A method for cleaning ovens and the like comprising the steps of placing a container of a mixture of calcium oxide and an ammonium salt in an enclosed oven, adding water to said mixture to form steam and ammonia gas, condensing said steam and gas on the inner surfaces of said oven, and removing said condensate from said surfaces.

2. A method for cleaning ovens and the like comprising the steps of placing a container of a mixture of calcium oxide and ammonium chloride in an enclosed oven, adding water to said mixture to form steam and ammonia gas, condensing said steam and gas on the inner surfaces of said oven, and removing said condensate from said surfaces.

3. A method for cleaning ovens and the like comprising the steps of adding water to a container of a mixture of calcium oxide and an ammonium salt, immediately placing said container in an enclosed oven whereby steam and ammonia gas from the container is condensed on the inner surfaces of the oven, and removing the condensate thus formed from said surfaces.

4. A method for cleaning ovens and the like comprising the steps of adding water to a container of a mixture of calcium oxide and ammonium chloride, immediately placing said container in an enclosed oven whereby steam and ammonia gas from the container is condensed on the inner surfaces of the oven, and removing the condensate thus formed from said surfaces.

5. The method as defined in claim 1, wherein said calcium oxide is in lump form and wherein said ammonium salt is of relatively fine particle size.

6. The method as defined in claim 4, wherein said calcium oxide is in lump form and said ammonium chloride is of relatively fine particle size.

References Cited by the Examiner

UNITED STATES PATENTS

382,322	5/88	Parsons	252—90
709,846	9/02	Young	252—176
1,581,413	4/26	Yoakam	252—155
2,431,470	11/47	Fawkes	252—189
3,079,284	2/63	Boucher	134—4

OTHER REFERENCES

The Family Circle, Aug. 11, 1944, vol. 25, No. 6 (section devoted to "Short Cuts and Salvage"; no page available).

DONALL H. SYLVESTER, *Primary Examiner.*

CHARLES A. WILLMUTH, MORRIS O. WOLK, *Examiners.*