Oct. 27, 1959 H. A. TOULMIN, JR 2,910,391

METHOD OF APPLYING AEROSOL DETERGENT FOG

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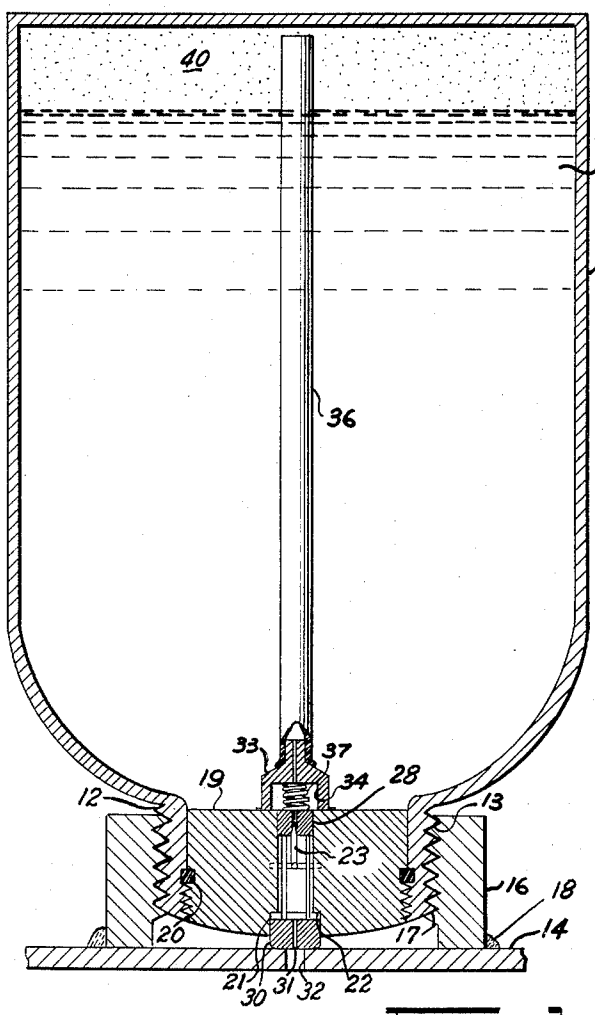


Fig. 2.

Fig. 3.

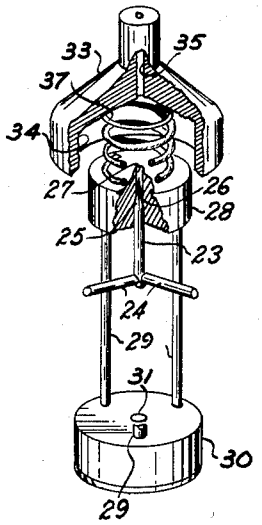
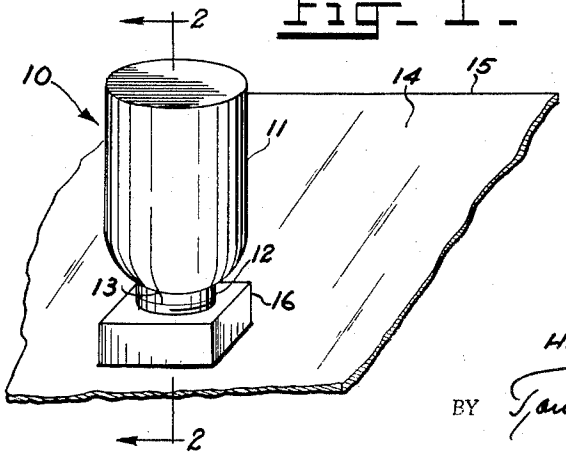


Fig. 1.



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METHOD OF APPLYING AEROSOL DETERGENT FOG

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Application July 28, 1954, Serial No. 446,309

2 Claims. (Cl. 134—25)

The present invention relates to the use of a cleansing agent in the form of a fog, more particularly to a novel method of cleansing dishes by applying a detergent fog thereto.

It has been the practice in the past for cleansing agents to take various forms. These forms depended primarily upon the specific application for which the cleaning agent was to be employed. In practice, the conventional cleansing agents are soaps or detergents. In recent years the use of detergents has been gradually increasing and supplanting the use of soaps in various applications. One of these applications is in the washing of dishes.

The detergents themselves are usually made in liquid or other forms and, as such, are applied directly to the article to be cleansed. In the washing of dishes the usual procedure is to introduce either a liquid or a powder detergent into a quantity of water in which the dishes are to be washed. In this operation, however, successful cleansing of the dishes depends upon using a considerable quantity of detergent. In addition, it is necessary that the detergent be dissolved completely and concentrated equally throughout the entire quantity of water. Furthermore, in this process of washing dishes it is necessary that the hands of the operator be immersed in water during the washing operation. In some instances this may result in irritation to the skin of the hands.

The present invention proposes a novel article and method for washing dishes which eliminates the disadvantages discussed above. In this invention a liquid detergent is packaged in an aerosol container which contains a gaseous propellant. A suitable form of a valve is provided on the container to release the detergent in the form of a fog. By employing this article an improved method of washing dishes is possible. This method comprises placing the dishes in a rack either in the sink or within an enclosing member, wetting the dishes with hot water, and then applying the detergent in the form of a fog to the wet dishes. The dishes may then be rinsed with warm water and then dried by evaporation or by any of the conventional methods. This invention is related to the method of drying dishes as disclosed in the application filed by the same inventor on August 31, 1954, and having the Serial Number 453,354, now abandoned.

As the detergent is released in the form of a fog, it can be seen that this fog which is propelled by a gas under pressure will be very penetrating and will reach all surfaces of the dishes. In addition, the amount of detergent which is used may be carefully regulated by manipulating the release valve on the aerosol container. In addition, there is no necessity whatsoever for the hands of the operator to come into contact with the detergent or the dishes during the dish washing operation.

The article of this invention may be used with a dish washer in a manner which will be presently described.

It is the principal object of this invention to provide a novel method of applying a detergent.

It is still another object of this invention to provide an improved method for cleansing dishes and the like.

It is a still further object of this invention to provide a method of applying a detergent fog to cleanse dishes and other articles.

Other objects and advantages of this invention will become apparent upon reference to the following description when taken in conjunction with the accompanying drawing wherein:

Figure 1 is an over-all perspective view of the article disclosed as this invention;

Figure 2 is a sectional view taken along the lines 2—2 of Figure 1, showing the contents and operating mechanism of the container; and

Figure 3 is a perspective view of the valve mechanism in enlarged scale with a portion of the bracket removed.

Proceeding now to the drawings, more particularly to Figure 1 wherein like reference symbols indicate the same parts throughout the various views, **10** indicates generally an article constructed in accordance with this invention. The article **10** comprises an aerosol container **11** which has a neck portion **12**. The neck portion **12** has external threads at **13**. Figure 1 illustrates that the aerosol container **11** is mounted upon the top wall **14** of a dishwasher cabinet **15**. In order to clearly describe the operation of this invention, this invention will be explained as it is employed in connection with the dishwasher similar to the type described in inventor's application filed on July 28, 1954, and having Serial Number 446,308.

The collar **16** has internal threads **17** and is rigidly secured to the top wall **14** by means of welds **18** or by any suitable means. The internal threads of the collar **16** are adapted for threaded cooperation with the external threads **13** of the neck portion of the aerosol container. A closure member **19** is rigidly secured within the neck portion **12**. As shown in Figure 2 the closure member **19** is threaded within the neck portion **12** and there is a gasket member **20** at the junction of the threaded and unthreaded portions on both the inner surface of the neck portion and the outer surface of the closure member. There is an axial bore **21** extending through the central portion of the closure member **19**. That portion of the axial bore **21** adjacent the outer surface of the closure member is enlarged so as to form an annular shoulder **22**. A needle valve **23** is rigidly secured within the axial bore **21** by means of radially extending arms **24** which are connected to the surface of the axial bore **21**. The needle valve **23** has a pointed portion **25** which is adapted to be seated on a valve seat **26** located in an axial bore **27** which extends completely through a cylindrical closure element **28**. The cylindrical closure element **28** is slidably received within the axial bore **21**. A plurality of longitudinally extending rods **29** interconnect the cylindrical closure member **28** with an actuating head **30**. The actuating head **30** is received within the enlarged portion of the axial bore **21** and extends beyond the outer surface of the closure member **19**.

The actuating head **30** has an axially extending passage **31** passing completely through the head. The passage **31** is adapted to cooperate with an aperture **32** in the top wall **14** of the dishwasher **15**.

A bracket member **33** is attached to the inner surface of the closure member **19**. The bracket member **33** has a chamber **34** and a longitudinal passage **35** extending from the chamber **34**. There is a tube **36** secured to the bracket **33** and the tube **36** extends vertically to the bottom wall of the aerosol container **11**. A spring **37** is positioned between one wall of the chamber **34** and the cylindrical closure member **28** so as to bias the closure member **28** into close relationship with the needle valve **23**.

A clear passage is established from the interior of the aerosol container to the exterior thereof by rotating the aerosol container. This rotation will result in the closure member **19** approaching the top wall **14**. The actuating head **30**, however, will remain stationary and will consequently cause the cylindrical enclosure member **28** to be moved upwardly from its resting position upon the needle valve **23**. As the member **28** moves upwardly, it will cause the needle valve **23** to become unseated and consequently will result in the contents of the aerosol container passing through the axial bore **27**, the axial bore **21**, the passage **31**, to the aperture **32** into the interior of the dishwasher.

Virtually the entire interior of the aerosol container is occupied by a liquid detergent indicated at **39**. This detergent may be a conventional liquid detergent of which there are numerous types on the market today. The exact nature of this detergent is not of controlling importance in the operation of this invention. It is pointed out that the stronger the detergent is the more effective the dish washing operation will be.

The remainder of the container **11** is occupied by a gaseous propellant **40** which is under considerable pressure. This propellant is of such a type that it is easily compressed and at the same time it is insoluble with the detergent. At present there are numerous forms of gaseous propellants on the market, any of which would be suitable for use in this invention.

It is pointed out that while a particular valve mechanism has been described in connection with the aerosol container of this invention, it should be borne in mind that any other value mechanism which would release the detergent from the container in the form of a fog would also be suitable. There are many aerosol valve arrangements in use today, any one of which is suitable for application with this invention. Consequently, a valve mechanism could be employed which would depend upon other means for operation rather than rotation of the aerosol container.

It is also not necessary for the detergent to be packaged in an aerosol container such as described above. This detergent may be packaged in a plastic container having flexible walls where pressure on the walls will result in the detergent being released from the container in the form of a fog. These plastic containers are presently being used for sprays, deodorants and the like and would be suitable for use in this invention.

In order to employ the article of this invention the container may be used either as illustrated in Figure 1 wherein it is attached to the wall of a dishwasher or the container may be used by itself. In the former instance the dishwaster is loaded to capacity and the dishes are wet down. The aerosol container is then operated so as to release a cloud of detergent fog within the interior of the dishwasher. When a sufficient amount of detergent has been introduced within the dishwaster all the dishes therein will be coated with the detergent. The action of the detergent upon the wet dishes will serve to clean the dishes. The dishes may then be suitably rinsed and dried by conventional methods.

If the dishes are being washed in a dishwaster which has no provision for the attachment of an aerosol container thereon, it is only necessary to open the closure member of the dishwasher and to release a detergent fog within the dishwasher by operating the aerosol valve mechanism. This results in an efficient method of thoroughly coating the dishes with a detergent.

In the event dishes are to be washed without the use of any dishwashing apparatus, it is only necessary that the dishes be loaded on to a rack and the rack be placed in a sink. After the dishes have been thoroughly wet down with hot water, an aerosol container having a detergent therein is then directed at the dishes in order to release a detergent fog which will completely cover all surfaces of the dishes. The resulting cleansed dishes may then be dried by hand.

Thus it can be seen that the present invention discloses a novel article of manufacture which enables detergent to be released in fog. In addition, a novel and effective method of washing dishes or similar articles by the use of a detergent fog is also disclosed. As pointed out previously, the application of a cleansing agent in the form of a fog results in every crevice and surface of the article being reached by this detergent. In addition, there is no necessity for the hands of the operator to ever come in contact with the cleansing agent. Not only is a cleansing agent packaged in the manner disclosed by this invention convenient to use, but will also prove to be very economical as the cost of packaging a detergent in this manner is very little.

It will be understood that this invention is susceptible to modification in order to adapt it to different usages and conditions and, accordingly, it is desired to comprehend such modifications within this invention as may fall within the scope of the appended claims.

What is claimed is:

1. In a method of washing dishes using a liquid detergent packaged under pressure with a gaseous propellant, the steps of supporting the dishes, passing hot water over the dishes to wet the dishes but not submerging the dishes in a body of water, spraying said so-packaged detergent in the form of a fog against the wet dishes, and rinsing the wet detergent-laden dishes to remove the detergent therefrom.

2. In a method of washing dishes using a liquid detergent packaged under pressure with a gaseous propellant, the steps of supporting the dishes in the atmosphere but not in a body of cleaning fluid, applying hot water to the dishes to wet all surfaces of the dishes while supporting the dishes in the atmosphere, spraying the so-packaged detergent in the form of a fog directly onto the wet dishes, and applying warm water to the wet detergent-laden dishes to remove the detergent therefrom whereby there is no necessity for the dishes to be contacted by hand during the washing operation.

References Cited in the file of this patent

UNITED STATES PATENTS

1,907,875	Robertson	May 9, 1933
2,153,577	Levine	Apr. 11, 1939
2,301,601	Wittwer	Nov. 10, 1942
2,477,998	McCowan	Aug. 2, 1949
2,506,449	Greenwood	May 2, 1950
2,529,808	Martin	Nov. 14, 1950
2,552,857	Knapp	May 15, 1951
2,565,954	Dey	Aug. 28, 1951
2,593,165	Metzger	Apr. 15, 1952
2,621,041	Efford	Dec. 9, 1952
2,643,914	Reswick	June 30, 1953
2,644,473	Fox	July 7, 1953
2,655,480	Spitzer	Oct. 13, 1953
2,689,576	Colstad	Sept. 21, 1954