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S. DEBUS

1,727,464

SPRAY NOZZLE

Filed Oct. 7, 1927

Fig. 1.

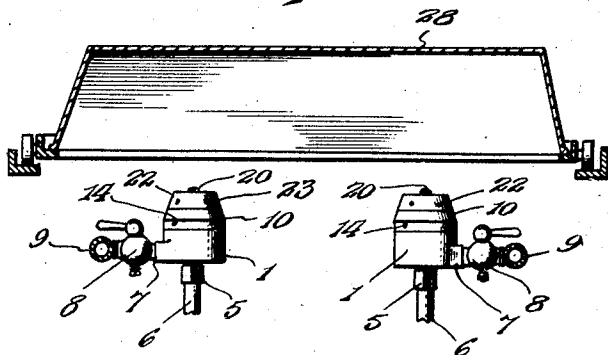


Fig. 2.

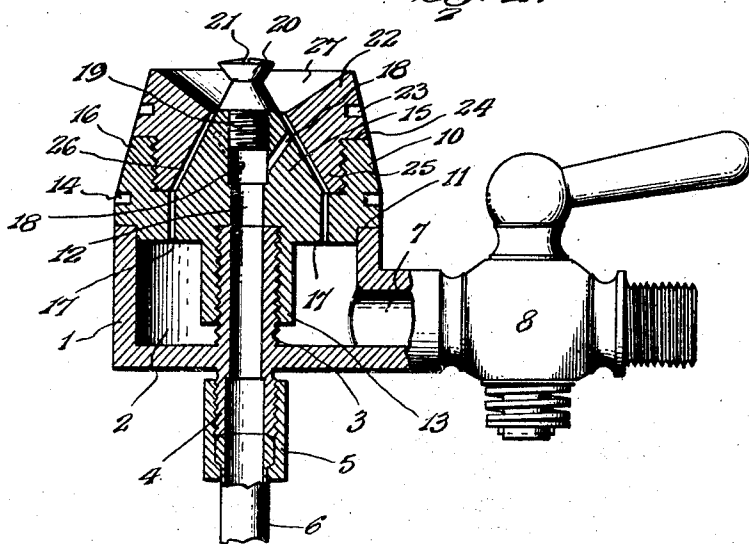
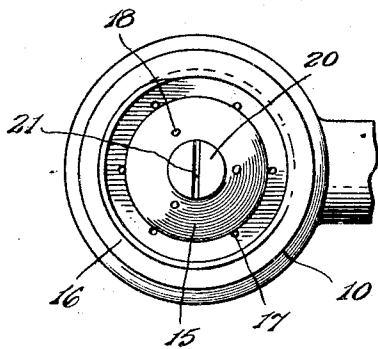


Fig. 3.



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SPRAY NOZZLE.

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This invention is a nozzle for spraying grease upon baking pans and has for its object the provision of a nozzle so constructed that it will be efficient in operation and its several parts may be easily assembled for use or disassembled when cleaning or repairing is necessary. The invention also provides a nozzle of such construction that leakage is avoided without the use of packing which is apt to deteriorate. The invention is illustrated in the accompanying drawing and will be hereinafter fully set forth.

In the drawing:

Figure 1 is an elevation of my improved nozzle arranged for use, a baking pan being illustrated in section;

Fig. 2 is an enlarged diametrical section of the nozzle, and

Fig. 3 is a top plan view of the nozzle with the top or cap member thereof removed.

In carrying out the present invention, there is provided a base member 1 which is circular in form as viewed from above and is hollow with open top, as shown at 2, to provide an air chamber of large capacity. Disposed centrally in the chamber 2, a threaded nipple 3 rises from the bottom of the base member and the bore of this nipple is extended through the bottom and through a lower nipple 4 which depends from the bottom, as clearly shown in Fig. 2. These nipples are both externally threaded and the lower nipple 4 is intended to receive a coupling sleeve or collar 5 whereby the oil supply pipe 6 is attached to the nozzle. The base member 1 is also provided with a tubular projection 7 on its periphery, and this projection may be formed integral with or constructed to be coupled to a valve casing 8 in which is mounted a cut-off valve whereby the flow of air may be controlled, the air supply pipe, shown at 9, being coupled to the valve in any approved manner. The top edge of the annular wall of the base member is machined to a flat smooth surface and an intermediate member 10 of circular form is constructed in its lower side with an annular rabbet 11 whereby it may fit closely within the wall of the base member and rest on the upper edge thereof so that when it is turned home it will form a ground joint with the base member and will extend over and cover the entire top of the same. A central bore 12 is formed through the intermediate member 10 and when the parts are properly assembled, this bore is alined with the bore of the nipple 3, the intermediate member being secured on the base member by a depending hub 13 which is internally threaded and engaged over and with the nipple 3, as clearly shown in Fig. 2. Sockets 14 are provided in the outer circumference of the intermediate nozzle member 10 to be engaged by a spanner or other turning tool so that the member may be easily turned home upon the base member. The intermediate member is of such form that it provides a central upstanding portion 15 in the form of a truncated cone and an annular rim member 16 which is internally threaded and spaced from the central conical extension 15. Air passages 17 are formed through the intermediate member 10 with their lower ends opening through the bottom thereof to establish communication with the air chamber 2 in the base member and their upper ends opening through the intermediate member at the base of the truncated cone 15, as shown in Fig. 2. Oil passages 18 are also formed through the cone 15, and these oil passages diverge upwardly with their lower ends opening into the central bore 12 of the member and their outer ends opening through the circumferential surface of the cone, as shown in Figs. 2 and 3. The bore 12 is internally threaded at its upper extremity so as to be engaged by the threaded stud 19 at the lower end of a spreader 20, and this spreader has a lower portion of such form that it meets the surface of the cone 15 flush therewith to form an uninterrupted continuation of the same when the parts are assembled. The upper extremity of the spreader is flared so that the rising stream of air and grease will be deflected and spread in an obvious manner. To facilitate the placing of the spreader, a notch 21 is formed in the upper surface thereof to be engaged by a screw driver or similar tool.

The nozzle also includes a top or cap member 22 which is of circular form to encircle the conical extension 15 and has its outer circumferential surface so disposed that, when the parts are assembled, it will be flush with the upwardly tapered portion of the intermediate member 10 and will form a continuation thereof, sockets 23 being provided in the surface of the cap member to be engaged by a spanner or other turning tool. This cap member is constructed externally to provide an annular shoulder 24 adapted to rest upon the upper edge of the rim of the intermediate member 10 and form a ground joint therewith when turned home, and depending from said shoulder is a threaded extension 25 which is adapted to engage internal threads on the annular rim or wall 16 so that the cap member may be easily secured in place and be held when it is secured. The extreme lower edge of the extension 25 is machine finished so that it will form a ground joint with the surface of the intermediate member between the rim or wall 16 and the cone 15 and leakage of air or oil at any point of the nozzle is thereby avoided. The bore of the cap member 22 is tapered upwardly and is at all points of greater diameter than the corresponding diameter of the cone 15 so that when the cap member is turned home an annular passage 26 will be provided between the cone 15 and the cap member and into which the air passages 17 deliver. The tapered bore of the cap member terminates in the same horizontal plane with the upper end of the cone 15 and from that point the cap is flared, as shown at 27, to provide clearance around the spreader 20 so that the spray will not be unduly confined but may spread out over a sufficient area to reach the entire surface of the pan 28 which is suitably supported above the nozzle.

In operation, the pan is supported upon a suitable carriage in inverted position over a pair of nozzles, each of which is designed to act upon one end portion of the pan. The air supply pipe is connected to any convenient reservoir or source of supply of air under pressure and the grease pipe 6 is connected with a suitable tank in which a supply of heated or melted grease is maintained. When a pan is to be greased, the air valve 8 is opened and a stream of air will thereupon flow into the air chamber 2 of the nozzle and will pass therefrom through the passages 17 into and through the space 26 so as to flow upwardly with considerable velocity and force. It will be noted that the combined area of all the passages 17 is much less than the area of the chamber 2 so that the air will be confined by the passages and will, consequently, escape therefrom under very high pressure. Inasmuch as the passages 18 communicate directly with the space

26, the air under pressure flowing at high velocity across the ends of said passages will suck portions of the grease supply through the passages and will at once atomize the same. The greater portion of the commingled air and grease will flow against the flared portion of the spreader 20 and will be thereby diverted so that as it escapes upwardly it will spread over a large area while the remaining portion of the mixture will tend to spread immediately upon issuing from the passage 26, the result being that during operation a fine mist or spray of grease and air flows upwardly from the nozzle and spreads to such an extent that the entire surface of the pan will be greased. Inasmuch as all the working parts of the nozzle are circular, the spreading of the grease in all directions will be uniform and no portion of the pan will receive a greater quantity of grease than any other portion, and the flow can be so controlled by manipulation of the air cut-off valve that no part of the pan will receive an excessive supply of grease.

The construction of my present nozzle is such that the parts may be very easily assembled and disassembled and leakage is avoided without the use of packing. The form of the several parts is also such that manufacturing is facilitated and the cost of production is minimized.

Having thus described the invention, I claim:

1. A spray nozzle comprising a base member including an annular wall, an air supply element leading through said wall, and a grease supply element leading from its bottom, an intermediate member covering the top of the base member secured to said grease supply element and resting on and forming a ground joint with said wall, said intermediate member having a central bore constituting a passage for grease and also having spaced openings through its bottom constituting air passages in communication with the interior of the base member and being further provided with lateral passages leading from said central bore, a spreader at the upper end of said intermediate member, and a circumscribing cap member secured upon the intermediate member and cooperating therewith to define an air passage in communication with said spaced openings and extending across said lateral grease passages to direct a stream flowing therethrough against the spreader.

2. A spray nozzle comprising an annular open top base member, a threaded nipple rising centrally from the bottom of the base member, a depending nipple on the bottom of the base member, the bores of said nipple being in alinement, means for coupling a grease supply to the depending nipple, an air supply connection on the side of the base member, an intermediate member having a

depending hub threaded onto the upstanding nipple of the base member and having its lower end constructed to rest on and form a ground joint with the upper edge of the base member, said intermediate member having air passages through its lower portion in communication with the interior of the base member and having a central bore alined with the bore of said nipple and being further provided with lateral passages leading from said bore near its upper end, a cap member secured in the intermediate member and forming therewith a passage communicating with the air passages through the lower portion of the intermediate member and extending across the passages leading laterally from the bore of the intermediate member, and a spreader secured in and closing the upper end of the intermediate member concentric with the cap member.

3. A spray nozzle comprising an annular open top base member, means for connecting the base member with an air supply, an intermediate member secured on and extending over the base member, means for connecting the intermediate member with a grease supply, said member having air passages through its lower portion in communication with the interior of the base member and having a central upstanding conical portion through which a central bore and lateral passages for grease are formed, and a cap member secured upon the intermediate member and having a tapered bore encircling the conical portion of the intermediate member in spaced relation thereto to define a passage communicating with the air passages through the lower portion of the intermediate member and extending across the outer ends of the grease passages therein.

4. A spray nozzle comprising an annular open top base member, means for connecting the base member with an air supply, an intermediate member secured on and covering the top of the base member and having air passages through its lower portion communicating with the interior of the base member, means for connecting the intermediate member with a grease supply, the intermediate member having a central upstanding conical portion located inwardly of the air passages therethrough and through which grease passages are formed and having an annular rim spaced from the conical portion, and a cap member fitting within and secured to the annular rim of the intermediate member and having a tapered bore encircling the conical portion of the intermediate member in spaced relation thereto to define a passage communicating with said air passages and extending across said grease passages.

5. A spray nozzle comprising an annular open top base member, means for connecting said base member with a source of air under pressure, an intermediate member secured upon the base member and having air passages through its lower portion communicating with the interior of the base member, means for connecting the intermediate member with a grease supply, the intermediate member having a central upstanding conical portion disposed inwardly of said air passages and through which grease passages are formed, a cap member secured upon the intermediate member and having a tapered bore encircling the conical portion of the intermediate member in spaced relation thereto and having a flared portion leading from the upper end of the tapered bore, and a spreader secured in and closing the upper end of the intermediate member and having the lower portion of its surface flush with the conical portion of said member and its upper end portion flared whereby to spread a stream issuing between the cap member and the intermediate member.

In testimony whereof I affix my signature.

SANDER DEBUS. [L. S.]

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