

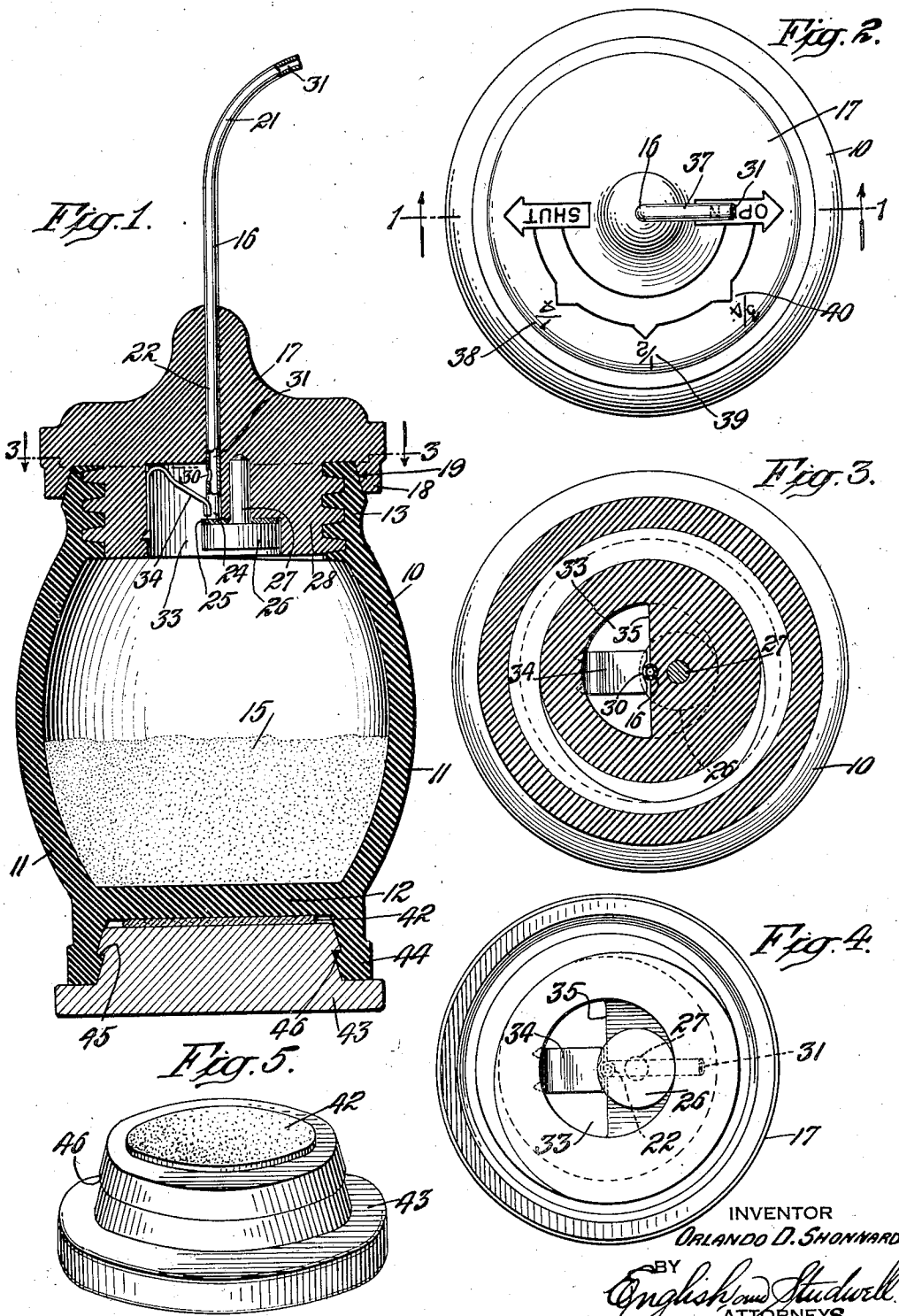
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DEVICE FOR APPLYING GRANULAR MATERIALS

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DEVICE FOR APPLYING GRANULAR MATERIALS

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The invention relates to an improvement in devices for applying granular particles and more especially finely-divided materials, such as powdered graphite, plumbago, and the like, on surfaces to be lubricated or protected by the coating of the granular material. The device of the present invention has been developed in connection with research work directed to discovering suitable means for applying graphite as a lubricant, but it will be understood, of course, that the invention is not to be restricted to the use of the device in connection with graphite, since it contains features which adapt it to applying other granular materials.

It has been proposed heretofore to provide devices or apparatus for applying graphite as a lubricant to surfaces requiring lubrication, either by the action of the conventional powder dispenser, the usual powder applicators, or by the ordinary oil can, but the use of these prior devices has not proven satisfactory because no means other than the usual cap or stopper have been provided for preventing the leakage of the graphite from the nozzle of the can or applicator when not in use, with the result that the graphite or other granulated material has been distributed over the tools in the workman's tool chest, clothes and other articles not intended to be sprayed or covered with the granulated material. Moreover, the devices heretofore provided for the purpose have not been arranged to apply a predetermined amount of the graphite or other lubricant or granular material at the required point. It is accordingly the object of the present invention to provide a device for applying graphite or other granular materials at the desired point in controlled amounts, and when the applicator is not in use positively seal it against leakage. To this end the invention consists in the improved applicator for granular materials hereinafter described and particularly pointed out in the appended claims.

In the accompanying drawing illustrating the preferred form of the invention, Fig. 1 is a vertical section of the improved applicator taken on the line 1-1 of Fig. 2; Fig. 2 is a top plan of the device shown in Fig. 1; Fig. 3 is a section taken on the line 3-3 of Fig. 1, looking in the direction of the arrows; Fig. 4 is a sectional plan looking upwardly from the middle part of Fig. 1; and Fig. 5 is a perspective view of the plug shown in section at the bottom of Fig. 1.

The improved device for applying granular materials and the like on surfaces and other points to be sprayed or covered with a granulated lubri-

cant or other granular material, as illustrated in the drawing, comprises a reservoir 10 composed of resilient or flexible material, such as soft rubber, as shown, or thin metal. In its preferred form the reservoir 10 is barrel-shaped, having bulging sides 11, a bottom 12 and a threaded open upper end or mouth 13. The reservoir 10 is adapted to contain the granulated material such as graphite 15, or other dry lubricant, or other granular material, which when the walls 11 of the reservoir 10 are pressed inwardly by the hand of the user is forced outwardly and ejected or expressed through the tubular nozzle 16 and applied in controlled amounts at the desired point.

The tubular nozzle 16 is mounted centrally in a closure 17 screwed into the threaded mouth 13 of the reservoir 10. The closure 17 is preferably composed of rubber, and is provided with a downwardly projecting circular flange 18 which overlaps the conical portion 19 of the threaded mouth 13 of the reservoir, thereby making a tight joint between the closure and the reservoir so that the contained material may not escape at this point.

The tubular nozzle 16 is shown with a curved outer end 21 and a straight inner portion 22 rotatably mounted in the closure 17. The fact that the closure 17 is composed of rubber assures a tight grip of the closure on the straight portion 22 of the nozzle 16 while permitting it to be rotated or turned in the closure. The nozzle 16 is interchangeable, that is to say, nozzles of different lengths are adapted for use with closure 17, depending upon the point to be applied with lubricating particles or particles of other material.

When a nozzle is inserted into the closure 17 the inner extremity 24 of the nozzle is seated against a washer 25 resting on the base 26 of a plug 27 inserted into the inner end or part 28 of the closure which is provided with threads enabling it to be screwed into the mouth 13 of the reservoir 10.

The graphite or other granular material 15 is expressed from the nozzle 16 through an aperture 30 formed in the wall of the inner end of the straight portion 22 of the nozzle. The aperture 30 has substantially the cross sectional area of the hole 31 in the nozzle. The inner end of the straight portion 22 of the nozzle 16 is located in a hemispherical groove 33 in the portion 28 of the closure 17. A U-shaped spring 34 presses the inner end of the straight portion 22 of the nozzle 16 against the semi-circular groove in the flat

portion 35 of the wall of the recess 33 and so holds the nozzle in operative position.

For some purposes, the amount of particles which can be expressed through the nozzle when the aperture 30 is fully exposed to the material in the reservoir, is not required, and so in the present device means are provided for controlling the amount of material to be admitted to the nozzle 16 through the aperture 30. For this purpose the nozzle 16 is adapted to be rotated in the closure 17 so as fully to shut off the aperture 30 against the groove in the wall 35 of the recess 33 or to expose a predetermined part of the aperture 30 to the reservoir for entrance therein of the material 15. It will be noted by reference to Fig. 1 that in the illustrated embodiment of the invention the aperture 30 is fully exposed to the recess 33. The position of the nozzle in this figure corresponds to the position indicated at 37 in Fig. 2. When the curved outer end 21 of the nozzle is turned to a diametrically opposed position, namely, to the position indicated by the word "shut" in Fig. 2, then the groove in the wall 35 of the recess 33 fully closes the aperture 30. Intermediate openings are indicated at the points 38, 39 and 40 of Fig. 2. It is thus seen that any controlled amount of granulated graphite or other granular material may be applied at the desired point, and that when the device is not in use the closing of the aperture 30 prevents leakage of the material through the nozzle 16.

It is sometimes desirable to spread the dry lubricant or other particles over the surface to which it has been applied by a soft leather or felt pad, and accordingly the device of the present application is provided with a leather pad 42 mounted on the upper end of a plug 43 adapted to be inserted into the lower flanged end 44 of the reservoir 10. The circular flange 44 is provided with an internal shoulder 45 adapted to grip and hold the corresponding shoulder 46 of the plug 43. And since the flange 44 is composed of flexible material, like the reservoir 10, the insertion and removal of the plug 43 is readily accomplished.

It will be understood that the term "granular material" includes all divided material including the range from what is commonly known as finely divided material to relatively coarse granular material since the device of the present application is equally adapted for applying these granular materials irrespective of their degree of subdivision. It will also be understood that the illustrated embodiment of the invention is only the preferred form, since other modifications falling within the terms of the appended claims will readily suggest themselves to those skilled in the art, and that therefore, the invention is not to be restricted to its illustrated form but to the principle defined by the claims.

Having thus described the invention, what I claim as new is:—

1. A device for applying granular material on surfaces, comprising a reservoir having resilient walls and a threaded mouth, a closure threaded into the mouth of the reservoir, the inner end

of said closure having a recess, a plug in the inner end of said closure, a tubular nozzle rotatably mounted in said closure with its inner extremity pressed against said plug to close it, the inner portion of said nozzle having an aperture in the side wall thereof, resilient means located in said recess for laterally pressing the inner portion of the nozzle against the wall of the recess, said wall of the recess serving to close the aperture in the inner end of the nozzle when the nozzle is turned.

2. A device for applying granular material on surfaces, comprising a reservoir having resilient walls and a threaded mouth, a closure including a plug portion threaded into the mouth of the reservoir and having a recess in its inner end opening into the reservoir, said closure having an annular depending flange frictionally engaged with the outer side of the threaded mouth to effect a tight joint, a tubular nozzle rotatably mounted in the closure having open and shut positions and having an aperture in its inner portion located in the recess, the wall of said recess serving to close the aperture in the nozzle when the latter is turned to shut position.

3. A device for applying granular material to surfaces, comprising a reservoir having resilient walls and an open mouth, a closure located in the mouth of the reservoir having a recess in its inner end opening into the reservoir, a tubular nozzle rotatably mounted in the closure having open and shut positions and having a side aperture spaced from the inner end opening into the recess when the nozzle is in open position and sealed by the wall of the recess when the nozzle is in shut position, and means laterally engaged with the nozzle for resiliently holding the inner end of the nozzle against the wall of the recess.

4. A device for applying granular material on surfaces, comprising a reservoir having resilient walls and an open mouth, a closure sealing the mouth of the reservoir and having its inner end in the reservoir, a tubular nozzle rotatably mounted in the closure and having open and shut positions, means in the inner end of the closure against which the inner open end of the nozzle abuts, resilient means for laterally forcing the inner portion of the nozzle against the closure, the inner portion of said nozzle having a lateral aperture opening into the reservoir which is adapted to be closed by the closure when the nozzle is turned to shut position.

5. A device for applying granular material to surfaces, comprising a reservoir having resilient walls and an open mouth, a closure located in the mouth of the reservoir having a recess in its inner end opening into the reservoir, a tubular nozzle rotatably mounted in the closure having open and shut positions and having a side aperture spaced from the inner end opening into the recess when the nozzle is in open position and sealed by the wall of the recess when the nozzle is in shut position, and means laterally engaged with the nozzle for holding the inner end of the nozzle against the wall of the recess.

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