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2,956,455

AUTOMATIC LUBRICATOR FOR ROTARY ELEMENTS

Filed June 26, 1959

2 Sheets-Sheet 1

FIG-1

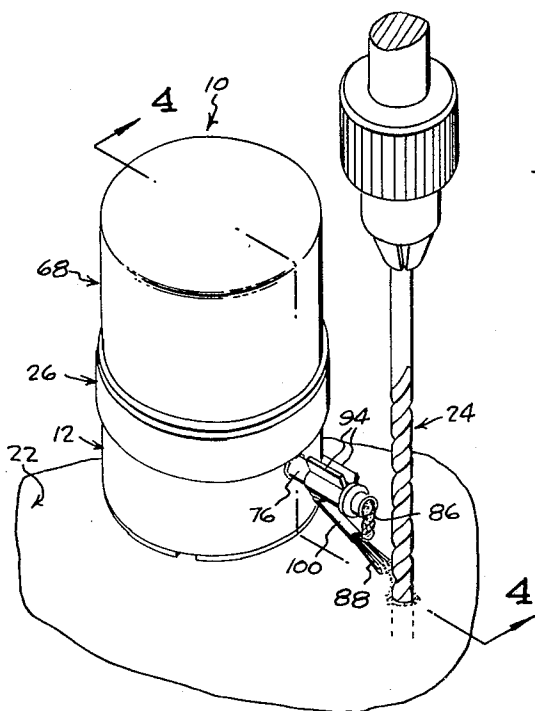
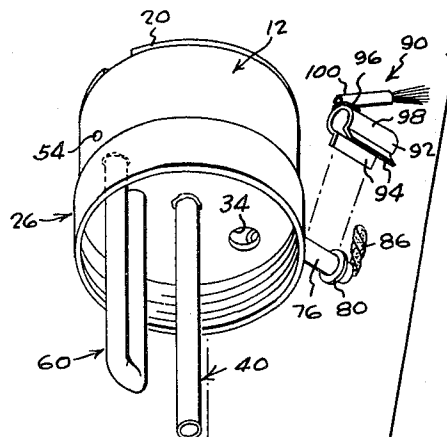
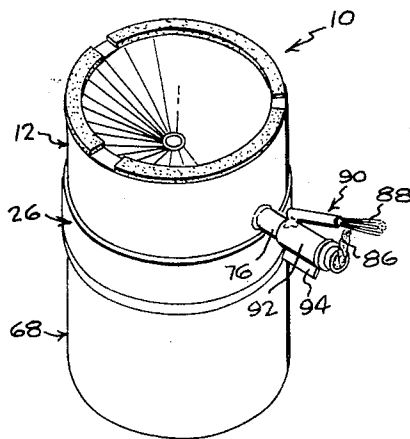


FIG-2

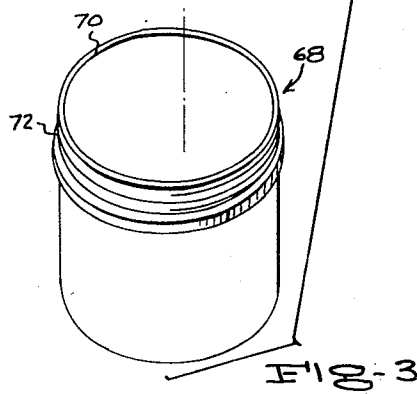


FIG-3

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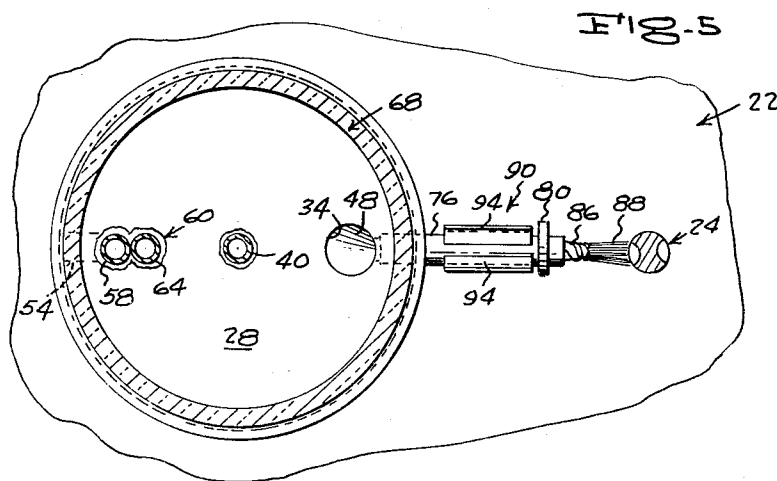
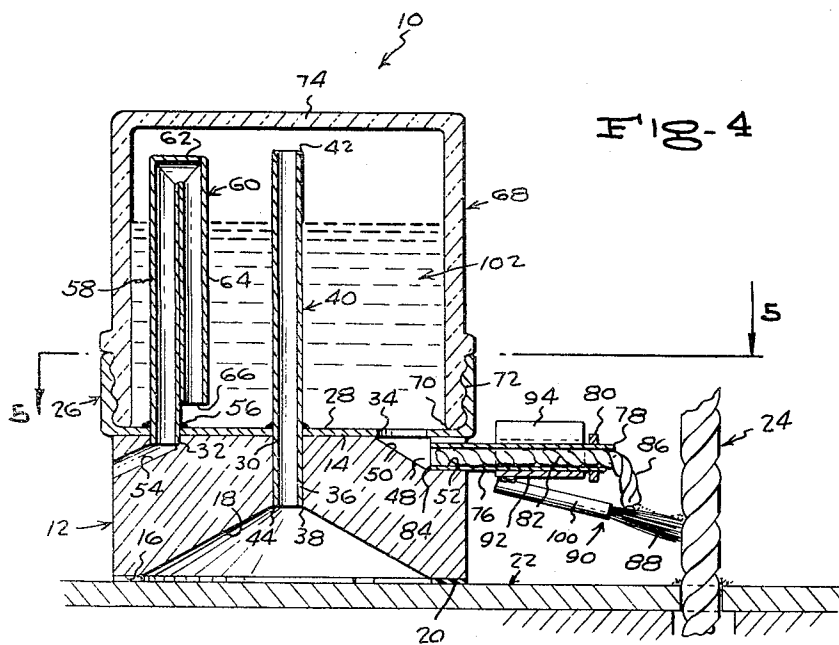
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AUTOMATIC LUBRICATOR FOR ROTARY ELEMENTS

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2 Sheets-Sheet 2



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## AUTOMATIC LUBRICATOR FOR ROTARY ELEMENTS

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9 Claims. (Cl. 77—55)

This invention relates to an improved automatic wick-feed lubricator for rotary elements, such as drills.

The primary object of the invention is to provide a more efficient device of this kind, which adapts itself to being portable and thereby being removable, when not in operation, from such as a supporting working surface adjacent to a drill, to preservative storage, support of the device adjacent to the particular rotary element to be lubricated not necessarily requiring securement other than the provision of non-slip means on its base.

Another important object of the invention is to provide a portable lubricant saving device of the character indicated above wherein the flow of lubricant to its wick can be stopped simply by inverting the device, and without the operation of a valve on the application of a stopper, and the device is then in a position to be protectively stored at a place away from its location of use, and is also in a position to be replenished or filled with lubricant without the removal and replacement of filling plugs or the like, and without likelihood of lubricant being spilled.

A further object of the invention is to provide a device of the character indicated above which involves an applicator brush of flexibility and resilience sufficient to enable the brush to conform to and follow irregularities on the surface of a rotary element being lubricated, and wherein a wick feed for the brush is provided which automatically regulates the flow of lubricant to the brush by capillary action.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

Figure 1 is a perspective view of a lubricator of the invention, in inverted storage and filling position;

Figure 2 is an enlarged perspective view showing the lubricator rested on a work surface with its applicator brush applied to a drill;

Figure 3 is an exploded perspective view of the lubricator;

Figure 4 is a further enlarged vertical section taken on the line 4—4 of Figure 2; and

Figure 5 is a horizontal section taken on the line 5—5 of Figure 4.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the illustrated lubricator, generally designated 10, comprises a preferably cylindrical and preferably solid heavy base 12 having a flat horizontal upper surface 14 and a centrally indented bottom surface 16, which defines an inverted filling funnel 18. Secured to the bottom surface around the funnel indentation 18 is a non-slip ring 20 of suitable form and material, such as rubber, which serves to hold the lubricator in place as on a work surface 22, adjacent to a rotary element, such as a drill bit 24. Where a flat surface exists near enough to the rotary element to be lubricated by the instant device, no other securing

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means than that afforded by the weight of the device and the non-slip ring 20 are required to maintain the device in place in operative position.

Suitably secured upon the upper surface 14 of the base 12 is an internally screw-threaded, upwardly opening cylindrical receiver 26 whose bottom wall 28 is imperforate except for a center hole 30, and two eccentric diametrically spaced and opposed holes 32 and 34, the hole 34 being larger in diameter than the hole 32. Extending downwardly through the center hole 30 and through an axial bore 36 formed in the base 12 and opening to the smaller end 38 of the funnel 18, is the lower end portion of a vertical vent or breather tube 40 which has open upper and lower ends 42 and 44, respectively, the lower end 44 being flush with the smaller end 38 of the funnel, and the upper end 42 of the tube being spaced above the receiver 26.

The larger eccentric hole 34 communicates with the inward end of a radial bore 48, which has an outwardly declining inward portion 50 and a horizontal outer portion 52, the latter opening to the side of the base 12.

As seen in Figure 4, the smaller eccentric hole 32 in the receiver bottom wall 28 is registered with the inward and elevated end of an outwardly declining, radial passage 54 which opens, at its depressed outward end, through the side of the base 12. Engaged through the hole 32 and fixed, as indicated at 56, to the bottom wall 28 is the lower end of the upstanding leg 58 of a folded tube 60. On the upper end of the leg 58 is a bight portion 62, and a perpendicular depending leg 64 depends from the bight portion which has an open lower end 66 located close to and spaced above the receiver bottom wall 28. The top of the bight portion 62 can be on a level with the open upper end 42 of the vent tube 40, as shown. The leg 64 is located radially inwardly of the leg 58 and close thereto. The diameters of the vent tube 40 and the folded tube 60 are substantially the same.

A preferably translucent or transparent cup 68 has an open lower end 70 to abut the upper surface of the receiver bottom wall 28, when in place on the receiver 26, and has thereat external screw threads 72 to thread into the receiver. The cup is proportioned in height so that its top wall 74 is spaced slightly above the upper end of the vent tube 40.

Plug fitted or otherwise suitably secured in the horizontal outward portion 52 of the base bore 48 is the inward end of a horizontal, rigid wick tube 76, which reaches outwardly from the side of the base 12, and has a free outward end 78, near to which is fixed an annular stop collar 80. A preferably spiral wick 82, which can be an ordinary smoking pipe cleaner, and which is longer than the wick tube 76, is engaged endwise in the tube 76, with its inward end 84 flush with the inward end of the tube 76, and has a free outer end portion 86, which, when wet with lubricant, depends from the outward end of the wick tube 76 so as to reach to and maintain contact with the resilient and flexible bristles 88 of an applicator brush assembly 90.

The applicator brush assembly 90, which is readily replaceable, comprises an elongated circular channel clip 92 of resilient metal, along whose separated edges are divergent lips 94 which facilitate snapping of the clip 92 onto the wick tube 76 from the underside thereof. Fixed, as indicated at 96, to the web 98 of the clip 92 at the inward end thereof, is the inward end of an outwardly declining brush handle 100, from whose outward end the bristles 88 extend. The brush bristles 88 are so located with respect to the pendent wick portion 78 that the lower end of the latter contacts the upper side of the bristles 88 and maintains contact therewith despite flexings of the bristles incident to engagement thereof with surface irregularities of such as the drill bit 24.

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The lubricator 10 is initially filled with fluid lubricant 102 simply by inverting the lubricator, as shown in Figure 1, and pouring lubricant through the funnel 18, to pass through the vent tube 40 into the interior of the lubricator, until the desired fluid level, visible through the transparent cup 68 is attained, the necessary venting of the lubricator then being provided by the folded tube 60. When erecting the filled lubricator, to put it in use position, it is necessary to plug the smaller end 38 of the funnel 18, as with a finger, in order to prevent spillage of lubricant therethrough, and, at the same time to rotate the lubricator clockwise, from the inverted position shown in Figures 1 and 4, so as to clear the folded tube 60 of lubricant present therein, by pouring it along the outward leg 58 and into the cup 68 through the inward leg 64.

Although there has been shown and described herein a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. An automatic lubricator for rotary elements, comprising a closed lubricant container having a closed upper end, base means closing the lower end of the container, an applicator brush assembly on and extending laterally from said base means, wick means on said base means feeding lubricant from the interior of the container to said applicator brush assembly, said base means having combined air venting and filling means extending therein and providing communication between the exterior of the container at the lower end of the base means and the interior of the container at a height above the base means higher than the contemplated level of liquid lubricant in the container, said lubricator being in erect position for use and being invertible to condition said combined means for filling or replenishing the container with lubricant, and combined air venting and air sealing means on said base means and providing communication between the interior of the container and the outside atmosphere only in the inverted position of the lubricator and providing an air seal in cooperation with lubricant in the container in the erect position of the lubricator.

2. An automatic lubricator for rotary elements, comprising a closed lubricant container having a closed upper end, base means closing the lower end of the container, an applicator brush assembly on and extending laterally from said base means, wick means on said base means feeding lubricant from the interior of the container to said applicator brush assembly, said base means having combined air venting and filling means extending therein and providing communication between the exterior of the container at the lower end of the base means and the interior of the container at a height above the base means higher than the contemplated level of liquid lubricant in the container, said lubricator being in erect position for use and being invertible to condition said combined means for filling or replenishing the container with lubricant, and combined air venting and air sealing means on said base means and providing communication between the interior of the container and the outside atmosphere only in the inverted position of the lubricator and providing an air seal in cooperation with lubricant in the container in the erect position of the lubricator, said combined air venting and filling means comprising a funnel formed in the lower end of the base means having a smaller end spaced from said lower end, and an upstanding vent tube within the interior of the container having an open upper end spaced downwardly from the upper end of the container and a lower end secured in communication with the smaller end of the funnel.

3. An automatic lubricator for rotary elements, comprising a closed lubricant container having a closed upper end, base means closing the lower end of the con-

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tainer, an applicator brush assembly on and extending laterally from said base means, wick means on said base means feeding lubricant from the interior of the container to said applicator brush assembly, said base means having combined air venting and filling means extending therein and providing communication between the exterior of the container at the lower end of the base means and the interior of the container at a height above the base means higher than the contemplated level of liquid lubricant in the container, said lubricator being in erect position for use and being invertible to condition said combined means for filling or replenishing the container with lubricant, and combined air venting and air sealing means on said base means and providing communication between the interior of the container and the outside atmosphere only in the inverted position of the lubricator and providing an air seal in cooperation with lubricant in the container in the erect position of the lubricator, said combined venting and air-sealing means comprising a bore extending through said base means and opening to a lower part of the interior of the container, and an upstanding folded tube, said folded tube having a vertical first tube secured at the lower end in communication with said bore, a bight portion on the upper end of the first tube, and a vertical second tube located laterally inwardly of the first tube and depending from said bight portion, said second tube having an open lower end located close to and spaced above said base means.

4. An automatic lubricator for rotary elements, comprising a weighted base to rest upon a surface adjacent to a rotary element to be lubricated, said base having upper and lower ends, an upwardly opening receiver fixed on the upper end of the base, said receiver having an annular side wall, an inverted cup upstanding from said base and having an open lower end removably secured on the receiver side wall, said cup being closed and having a top wall spaced above the upper end of the base, a first lateral bore in said base, said first bore opening at one end through the upper end of the base and at its other end through the side of the base, a wick feed mounted on the base and extending laterally outwardly therefrom, said wick feed having an inward end communicating with said first bore and an outward end, and a lubricating brush assembly mounted on said wick feed and having bristles at the outward end and fed by said wick feed, an upstanding combined air venting and filling tube located within the chamber defined by said cup, the base, and the receiver, said tube having an open upper end near to and spaced downwardly from the top wall of the cup, said base having a vertical bore extending therethrough with which the lower end of the tube is secured in communication, and a second lateral bore in said base across from said first lateral bore, said second lateral bore opening at one end into a lower part of said chamber and at its other end to the exterior of the base, a folded tube upstanding from the base within said chamber, said folded tube comprising a laterally outward first member secured at its lower end in communication with said second lateral bore, said first member having an upper end having thereon a laterally inwardly extending bight portion having a depending vertical inner tube member thereon, said inner tube member having an open lower end located in a lower part of said chamber on a level below the contemplated level of liquid lubricant in the chamber.

5. An automatic lubricator for rotary elements, comprising a weighted base to rest upon a surface adjacent to a rotary element to be lubricated, said base having upper and lower ends, an upwardly opening receiver fixed on the upper end of the base, said receiver having an annular side wall, an inverted cup upstanding from said base and having an open lower end removably secured on the receiver side wall, said cup being closed and having a top wall spaced above the upper end of the base, a first lateral bore in said base, said first bore opening at

one end through the upper end of the base and at its other end through the side of the base, a wick feed mounted on the base and extending laterally outwardly therefrom, said wick feed having an inward end communicating with said first bore and an outward end, and a lubricating brush assembly mounted on said wick feed and having bristles at the outward end of and fed by said wick feed, an upstanding combined air venting and filling tube located within the chamber defined by said cup, the base, and the receiver, said tube having an open upper end near to and spaced downwardly from the top wall of the cup, said base having a vertical bore extending therethrough with which the lower end of the tube is secured in communication, and a second lateral bore in said base across from said first lateral bore, said second lateral bore opening at one end into a lower part of said chamber and at its other end to the exterior of the base, a folded tube upstanding from the base within said chamber, said folded tube comprising a laterally outward first member secured at its lower end in communication with said second lateral bore, said first member having an upper end having thereon a laterally inwardly extending bight portion having a depending vertical inner tube member thereon, said inner tube member having an open lower end located in a lower part of said chamber on a level below the contemplated level of liquid lubricant in the chamber, when the lubricator is in its erect position of use, the lower end of the base being formed with a funnel indentation having a smaller end in communication with the vertical bore of the base, the lubricator being adapted to be inverted from its erect position to expose the funnel indentation for pouring of lubricant therein and through the combined air venting and filling tube for filling the chamber with lubricant.

6. An automatic lubricator for rotary elements, comprising a weighted base to rest upon a surface adjacent to a rotary element to be lubricated, said base having upper and lower ends, an upwardly opening receiver fixed on the upper end of the base, said receiver having an annular side wall, an inverted cup upstanding from said base and having an open lower end removably secured on the receiver side wall, said cup being closed and having a top wall spaced above the upper end of the base, a first lateral bore in said base, said first bore opening at one end through the upper end of the base and at its other end through the side of the base, a wick feed mounted on the base and extending laterally outwardly therefrom, said wick feed having an inward end communicating with said first bore and an outward end, and a lubricating brush assembly mounted on said wick feed and having bristles at the outward end of and fed by said wick feed, an upstanding combined air venting and filling tube located within the chamber defined by said cup, the base, and the receiver, said tube having an open upper end near to and spaced downwardly from the top wall of the cup, said base having a vertical bore extending therethrough with which the lower end of the tube is secured in communication, and a second lateral bore in said base across from said first lateral bore, said second lateral bore opening at one end into a lower part of said chamber and at its other end to the exterior of the base, a folded tube upstanding from the base within said chamber, said folded tube comprising a laterally outward first member secured at its lower end in communication with said second lateral bore, said first member having an upper end having thereon a laterally inwardly extending bight portion having a depending vertical inner tube member thereon, said inner tube member having an open lower end located in a lower part of said chamber on a level below the contemplated level of liquid lubricant in the chamber, when the lubricator is in its erect position of use, the lower end of the base being formed with a funnel indentation having a smaller end in communication with

the vertical bore of the base, the lubricator being adapted to be inverted from its erect position to expose the funnel indentation for pouring of lubricant therein and through the combined air venting and filling tube for filling the chamber with lubricant, said wick feed comprising a rigid horizontal wick tube engaged in said first lateral bore and having a free outward end, a wick extending through said wick tube and having a flexible outward end portion depending from the outward end of the wick tube, said lubricating brush assembly comprising a spring clip securably engaged on the wick tube.

7. An automatic lubricator for rotary elements, comprising a weighted base to rest upon a surface adjacent to a rotary element to be lubricated, said base having upper and lower ends, an upwardly opening receiver fixed on the upper end of the base, said receiver having an annular side wall, an inverted cup upstanding from said base and having an open lower end, removably secured on the receiver side wall, said cup being closed and having a top wall spaced above the upper end of the base, a first lateral bore in said base, said first bore opening at one end through the upper end of the base and at its other end through the side of the base, a wick feed mounted on the base and extending laterally outwardly therefrom, said wick feed having an inward end communicating with said first bore and an outward end, and a lubricating brush assembly mounted on said wick feed and having bristles at the outward end of and fed by said wick feed, an upstanding combined air venting and filling tube located within the chamber defined by said cup, the base, and the receiver, said tube having an open upper end near to and spaced downwardly from the top wall of the cup, said base having a vertical bore extending therethrough with which the lower end of the tube is secured in communication, and a second lateral bore in said base across from said first lateral bore, said second lateral bore opening at one end into a lower part of said chamber and at its other end to the exterior of the base, a folded tube upstanding from the base within said chamber, said folded tube comprising a laterally outward first member secured at its lower end in communication with said second lateral bore, said first member having an upper end having thereon a laterally inwardly extending bight portion having a depending vertical inner tube member thereon, said inner tube member having an open lower end located in a lower part of said chamber on a level below the contemplated level of liquid lubricant in the chamber, when the lubricator is in its erect position of use, the lower end of the base being formed with a funnel indentation having a smaller end in communication with the vertical bore of the base, the lubricator being adapted to be inverted from its erect position to expose the funnel indentation for pouring of lubricant therein and through the combined air venting and filling tube for filling the chamber with lubricant, said wick feed comprising a rigid horizontal wick tube engaged in said first lateral bore and having a free outward end, a wick extending through said wick tube and having a flexible outward end portion depending from the outward end of the wick tube, said lubricating brush assembly comprising a spring clip securably engaged on the wick tube, and a declining brush handle having an inward end secured to the underside of the clip at the inward end thereof and a free depressed outward end from which said bristles extend.

8. A lubricator for rotary elements comprising a closed lubricant container having a closed upper end, base means closing the lower end of the container, there being a bore in said means having one end in communication with the interior of said container and having the other end opening out of the side of said base means, a horizontally disposed tube projecting laterally out of the other end of said bore, a wick extending through said tube and having a pendant flexible outward end portion beyond the outward end of the wick tube, and an ap-

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plicator brush assembly on said tube and engaged by said pendant wick portion.

9. A lubricator for rotary elements comprising a closed lubricant container having a closed upper end, base means closing the lower end of the container, there being a bore in said base means having one end in communication with the interior of said container and having the other end opening out of the side of said base means, a horizontally disposed tube projecting laterally out of the other end of said bore, a wick extending through said tube and having a pendant flexible outward

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end portion beyond the outward end of the wick tube, and an applicator brush assembly comprising a spring clip removably embracing said tube, and flexible bristles beneath and in contact with said pendant wick portion.

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