Feb. 16, 1954 L. WIGHTMAN 2,669,242

CLEANING AND OILING APPARATUS FOR DENTAL INSTRUMENTS

Filed Aug. 27, 1949

FIG 1

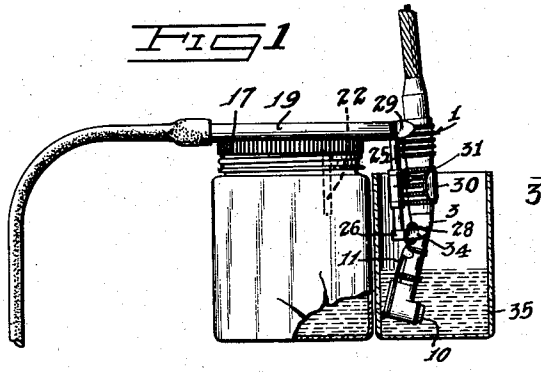
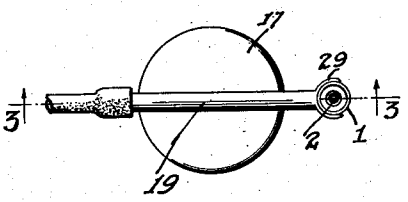


FIG 2



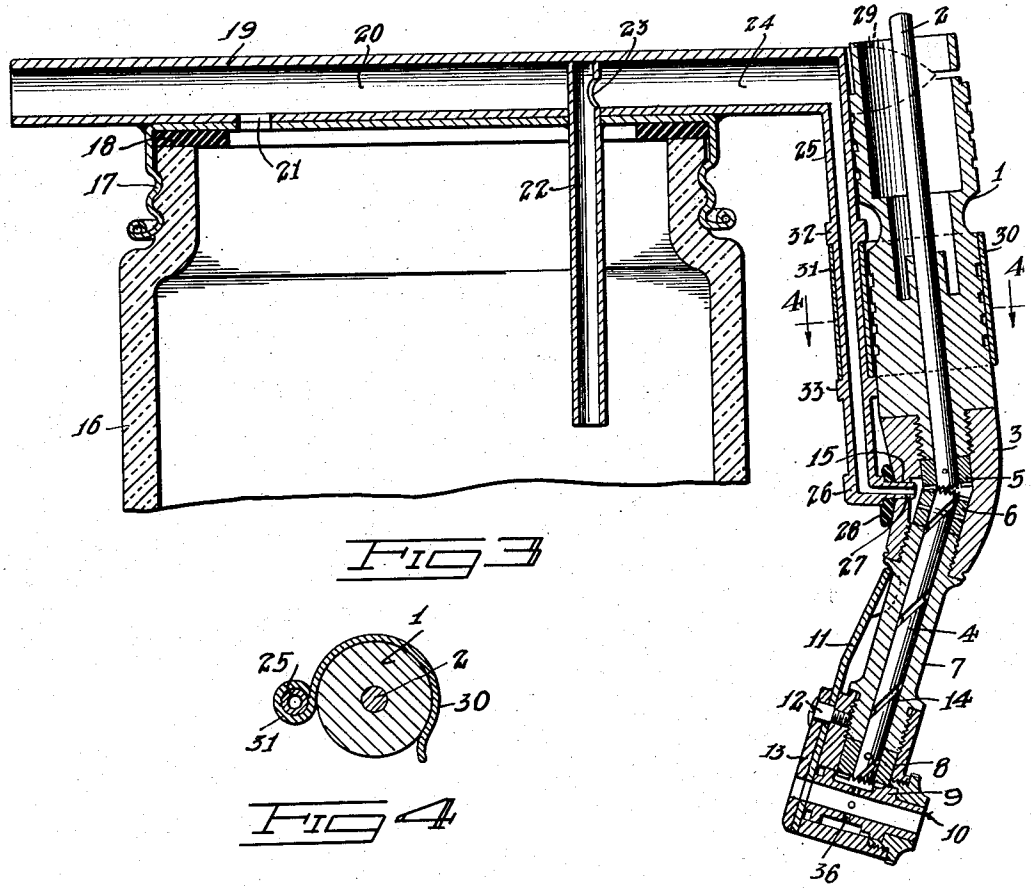


FIG 3

FIG 4

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CLEANING AND OILING APPARATUS FOR DENTAL INSTRUMENTS

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6 Claims. (Cl. 134—166)

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This invention relates to cleaning and oiling apparatus for dental instruments, and is more particularly related to an apparatus for the cleaning and oiling of the contra angle commonly used by dentists and connected between the straight handpiece of a dental drilling mechanism and which is adapted to hold the desired bit, grinding or other instrument required for the processing or cleaning of the teeth.

The mechanism utilized is a fine instrument and requires, because of its nature of use, cleaning and adequate lubrication or oiling in order that it may be kept in proper condition for use.

No adequate means are now available for either the cleaning or oiling of this fine mechanism. As the instrument is used as a drill or grinding mechanism for drilling in grinding teeth, the material ground away from the teeth may easily find its way into the operating mechanism of the structure requiring the removal before the instrument can be satisfactorily sterilized, and as the instrument is a relatively high speed revolving mechanism, proper and frequent lubrication is required in order to keep the same in the best operating condition as in the use of any drill the proper operation of the drill is paramount to the success of a drilling operation and if the structure vibrates or becomes worn because of improper care, a satisfactory drilling or grinding operation can not be performed.

It is therefore an object of this invention to provide a means which will permit of the easy, rapid and efficient cleaning and oiling of this mechanism in a single operation and which may be easily and quickly performed without the necessity of disassembling the contra angle or removing its operating parts.

Another object of this invention is to provide a means of cleaning and oiling the contra angle of a dental drilling mechanism in which a sterile oil and sterilizing solution may be utilized for the purpose of cleaning from the drill all foreign matter at the same time effecting a proper lubrication of the instrument so that just sufficient oil remains in the instrument to carry out the required lubrication.

Other objects and advantages of this invention it is believed will be apparent from the following detailed description of a preferred embodiment thereof as illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a side elevation partly in vertical section of the contra angles, cleaning and lubricating means embodying my invention adapted to a contra angle.

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Figure 2 is a top elevation thereof.

Figure 3 is an enlarged fragmental section thereof.

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 3.

In the preferred embodiment of my invention illustrated in the accompanying drawings, I have illustrated my invention as the same is adapted to the cleaning and lubrication of a contra angle as used in connection with the drill of a dentist's drilling machine.

As illustrated in the drawing, I have shown one form of contra angle as it is commonly used and which has the general characteristics of all such angles. The contra angle thus includes a body piece 1 through the medium of which it is removably connected to the ordinary handpiece of a dental drilling mechanism so that its shaft 2 is releasably coupled with the driven shaft within the handle.

Many different forms of coupling may be employed and my invention is in no way concerned with the particular form or construction of contra angle or its manner of releasable attachment with the drilling mechanism. As illustrated the shaft 2 is journaled in a bearing provided in the body piece 1. The angle section 3 is removably threaded to the body 1 and provides the angle at which the operating shaft or pinion 4 of the contra angle is driven from the shaft 2 mounted in the body piece 1. The shaft 2 is provided with a gear 5 which meshes with a gear 6 secured to the shaft 4 providing the angle drive. The pinion or shaft 4 is journaled in a body piece 7 throughout its length, providing a bearing. At its opposite end the shaft 4 is provided with a gear 8 which meshes with gear teeth formed on the flange 9 of the tool sleeve 10.

Any suitable form of chuck or gripping means is provided which will firmly secure the shank of the bit or grinding tool utilized within the tool sleeve 10. In the particular form illustrated a lock bar 11 is provided which is adapted to rotate upon a stud 12 passed through the end piece 13 of the contra angle so that it may be rotated to engage with a non-circular end or section of the bit or tool mounted in the sleeve 10 to hold the same from longitudinal movement therein. In this contra angle the shaft 4 is provided with a spiral groove 14 through which lubricating oil or a sterilizing fluid may be drawn or forced. This spiral groove extends the entire length of the pinion or shaft 4.

The angle connector 3 is in the particular form of contra angle shown provided with a hole 15 for the purpose of lubricating the gears 5

and 6. In other forms of contra angles the lubrication hole may be omitted or may be provided at another point in the structure.

My invention is not limited to the particular form of contra angle shown, which is herein merely illustrated so that a better understanding of my invention may be had.

In order to properly lubricate and clean this contra angle in accordance with my invention, I have provided a means for drawing or forcing a sterile lubricant or other suitable liquid through the operating mechanism of the contra angle so that it will fall between the shaft 4 and its supporting structure as by passing through the spiral groove 14 and will then pass out of the hole 15 to a collecting device.

While this operation is being performed, I may rotate the shaft 2 so that the shaft 4 is revolved, enabling the lubricant or liquid to reach every part of the structure, cleaning out all foreign matter and at the same time lubricating the structure. In order to accomplish this result, I provide a collection jar 16 which is provided with a cap 17 which may be screw-threaded to the neck of the jar 16 or may be releasably secured thereto by any suitable means. A sealing ring 18 may be provided to form a fluid-tight connection between the cap 17 and the jar 16. Formed integral with, or secured to, the cap 17 is a tube 19 providing a fluid passage 20. The passage 20 communicates with the interior of the jar 16 through a port 21 formed through the tube 19 and cover 17. A fluid discharge tube 22 intercepts the passage 20 and the tube 22 extends downwardly a suitable distance into the jar 16. A port 23 is formed in the tube 22 and connects with the passage 24 formed in the tube 19 beyond the tube 22. Formed at the end of the tube 19 is an angled section of the tube 25 which extends downwardly toward the base of the jar 16 and is provided at its lower end with an angled tip 26 terminating in a small diameter tube 27 adapted to fit in the hole 15 of the angle connector 3.

A sealing ring 28 is provided around the small diameter tube 27 in position to engage the outer surface of the angle connector 3 forming a fluid-tight connection at this point.

In order to hold the contra angle firmly in position, I form at the end of the tube 19 a saddle 29 into which the body 1 of the contra angle seats. A removable friction clamp 30 is carried by the tube section 25 and is adapted to pass around the body 1 to firmly clamp the same in position so that a fluid-tight connection is maintained between the angle section 3 and the downwardly extending tube 25.

As herein illustrated, the clamp is formed as a curved clip adapted to pass around the body 1 and having at its inner end a sleeve 31 held in position between shoulders 32 and 33 on the downwardly extending tube section 25. Any other suitable form of releasing clamp may be employed. In order to firmly hold the contra angle in position at the connector 3 I provide a pair of ears 34 at the lower end of the downwardly extending tube 25 which forms a saddle for the reception of the angle connector 3, preventing lateral movement of the contra angle with reference to the small diameter tube 27. I connect the tube 19 with any suitable source of reduced pressure as, for example, by connecting the same to a laboratory type water ejector (not shown) so as to induce a reduced pressure within the jar 16.

With the contra angle positioned as shown in Figure 3 and held firmly, I then drop the lower end of the contra angle into a suitable container as indicated at 35 which contains the liquid or lubricant to be used. The liquid in the container 35 may be any one of a number of sterile lubricants and may be used hot or cold, depending upon the conditions encountered. The action is that this liquid in the container 35 is drawn upward into the sleeve 10, or through the opening in the end piece 13, passes through a hole 36 formed therein to first lubricate the gear connection between the sleeve 10 and the shaft 4, at the same time carrying with it any foreign material which may be lodged either in the sleeve 10 around the gear connection or which may tend to lodge between the shaft 4 and the body piece 7. The lubricant will pass through the groove 14 carrying the foreign matter from the end of the gear element 6 and will lubricate gear teeth provided between the collars 5 and 6 and will then pass out through the small diameter tube 27, through the tube 25, through the passage 24, through the downwardly extending discharge tube 22 into the jar 16 where it will be deposited.

At this time I prefer that the contra angle be connected with the dental drilling instrument hand piece (not shown) so that the shaft 2 may be driven by the motor provided for operating the structure. Such rotation of parts during the cleaning and lubricating operation insures that all foreign matter will be removed and the structure will be thoroughly lubricated and sterilized during the operation.

After a suitable quantity of liquid is drawn from the container 35, the contra angle is withdrawn from the container 35 and the suction is continued until substantially all of the liquid or lubricant has been drawn through the structure of the contra angle insuring a sterile, clean and properly lubricated structure where there does not remain a quantity of lubricant which might otherwise pass from the end of the contra angle during its operation.

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

I claim:

1. In a device of the class described, the combination of a container, means whereby a reduced pressure may be established within the container, means extending into the container to deliver a fluid into the container under the influence of the reduced pressure, said means including a downwardly extending conduit having at its end an angled section of reduced diameter, spaced means providing seats for a contra angle to be cleaned, a clamp element adapted to securely clamp the contra angle with relation to the spaced supports and the reduced section of the conduit being of a diameter such as to permit its passing into an opening formed in the contra angle.

2. In a device of the class described, the combination of a container, a cover for the container, means on the container providing an interrupted fluid passage, means establishing communication with the interior of the container on one side of the interruption, fluid discharge means extending into the container from the passage on the other side of the interruption, an angled tube communicating with the passage, clamp means provided on the angled tube

and the angled tube having at its lower end an angled tube section.

3. In a device of the class described, the combination of a reduced pressure jar and a container for a cleaning fluid, the reduced pressure jar having a cap, means on the cap communicating with the interior of the cap for establishing communication between the interior of the cap and a source of reduced pressure, a fluid discharge means extending through the cap, and means connected with the fluid discharge means and adapted to be releasably secured to a contra angle for establishing communication through the contra angle with the cleaning fluid in the cleaning fluid container whereby the cleaning fluid may be drawn through the contra angle and discharged into the reduced pressure jar.

4. A device for cleaning a contra angle having a revolving shaft and gear means for driving the revolving shaft and a body supporting the revolving shaft comprising a low pressure container, a reduced pressure connection for the container for establishing communication between the interior of the container and a source of reduced pressure, a cleaning fluid discharge means extending into the container in communication with the reduced pressure within the container, a connecting means in communication with the said discharge means, clamp means for releasably clamping the connecting means to the contra angle, the connecting means having an angled tube section adapted to establish communication with the interior of the body of the contra angle through an opening therein whereby when the contra angle is inserted in a body of cleaning fluid and the shaft thereof is revolving, the cleaning fluid may be drawn through the body, around the shaft and over the gear means to clean and lubricate the same.

5. A device for cleaning a contra angle having a revolving shaft and gear means for driving the revolving shaft and a body supporting the revolving shaft comprising a low pressure container, a reduced pressure connection for the container for establishing communication between the interior of the container and a source

of reduced pressure, a cleaning fluid discharge means extending into the container in communication with the reduced pressure within the container, a connecting means in communication with the said discharge means, clamp means for releasably clamping the connecting means to the contra angle, the connecting means having an angled tube section adapted to establish communication with the interior of the body of the contra angle through an opening therein, and the connecting means having spaced saddles for holding the contra angle in position with respect to the connecting means, whereby when the contra angle is inserted in a body of cleaning fluid and the shaft thereof is revolving, the cleaning fluid may be drawn through the body around the shaft and over the gear means to clean and lubricate the same.

6. A device for cleaning and lubricating a contra angle having a revolving shaft and gear means for driving the revolving shaft and a body supporting the revolving shaft comprising: a lubricant container, a differential pressure bottle and means for establishing communication between the lubricant container and the differential pressure bottle through the body of the contra angle whereby lubricant may be forced through the body of the contra angle while the shaft therein is rotating to clean and lubricate the shaft and gear means thereof.

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