LUBRICANT AND METHOD OF FITTING AND TRAIL MOUNTING OF PROSTHODONTIC APPLIANCES

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Continuation-in-part of Ser. No. 184,949, Sept. 29, 1971, abandoned.

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Field of Search................................. 32/1, 2, DIG. 2

References Cited
UNITED STATES PATENTS
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ABSTRACT
This invention provides a lubricating compound for the fitting of crowns, bridges and other prosthodontic restorations as used in prosthodontic dentistry. This compound in a preferred embodiment has a base which comprises ninety or more percent of the compound. A coloring agent which may be zinc oxide is five percent or less of the compound while small percentages of a bacteriostatic agent and an anti-inflammatory agent make up the rest of the compound. The compound is preferably readily washed from the prepared teeth and restoration after a try-in of the unfinished crown, bridge or other prosthodontic restoration has been done. This lubricant provides a new testing technique and method to be employed for the duration of the trial period of the restoration.

10 Claims, No Drawings
LUBRICANT AND METHOD OF FITTING AND TRAIL MOUNTING OF PROSTHODONTIC APPLIANCES

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of U.S. Patent application Ser. No. 184,949 filed Sept. 29, 1971 in the name of A. Milton Bell and entitled, "Lubricant for the Fitting and Trial Mounting of Prosthetic Appliances."

With the acceptance of this application by the U.S. Patent Office the application Ser. No. 184,949 is expressly abandoned.

BACKGROUND OF THE INVENTION

1. Classification of the Art

In accordance with the classification of art as established in the United States Patent Office the present invention pertains to the general class of "Drugs, Bio-Affecting and Body Treating Compounds" and more particularly to the subclass of "lubricant or derivative of a carbohydrate active ingredient."

Still in this same drug class may be classed the added anti-inflammatory agent which is preferably included in the lubricant compound. This agent is preferably a steroid organic compound. As other anti-inflammatory agents may be used as well as synthetic anti-inflammatory agents a portion of the prior art should be found in the subclass generally identified as "organic active ingredient."

Reference of the method of using the compound is found in the class entitled, "Dentistry" and the subclass thereunder entitled, "dentes." 2. Description of the Prior Art

In the fitting of copings, full crowns, inlays, permanent bridges and the like, the dentist has customarily fitted or tried-in the unfinished prosthetic restoration to the tooth preparation without the benefit of any lubricating material.

The dentist, in so doing, is oftentimes handicapped in this procedure by tenso-frictional or other interferences such as is known in the dental profession as contact points with adjacent teeth, parallelism of abutments, path of insertion, etc. These interferences act to prevent the proper seating of the dental restoration upon or within the tooth preparation as the case may be.

After the initial fittings and try-in of the restoration or restorations, the restorative appliance is finished and readied for the final insertion. Some dental practitioners may employ so called temporary cements for insertion of the appliance during a trial or test period. These temporary cements set to various degrees of hardness thereby acting as further interferences to the complete seating of the finished restoration. Thus, the incompletely seated restoration is often over-adjusted, especially on the biting surfaces, in order to achieve a comfortable biting pattern for the patient (relief of interocclusal interferences) and/or improper contact points and marginal discrepancies. These marginal discrepancies can lead to washing out of the final cement mediating inflammatory processes and possible recurrent decay at the margins of the restoration.

It is an accepted fact that dental procedures which require the cutting of the tooth surface into the dentinal area for the placement of fillings, inlays, crowns, etc., utilizing the best accepted techniques and instru-
necessary. A small amount of a bacteriostatic agent and an anti-inflammatory agent is also provided in the compound.

The compound of this invention is preferably readily and easily cleansed from the retainers and prepared teeth by lavaging with warm water, as by rinsing and/or with a warm water syringe. This lubricant permits a new and improved method of a try-in and trial period to be useful in prosthodontic dentistry and it is an object of this invention to more completely describe and claim such a method.

In addition to the above summary the following disclosure is detailed to insure adequacy and aid in understanding of the invention. This disclosure, however, is not intended to prejudice that purpose of a patent which is to cover each new inventive concept therein no matter how it may later be disguised by variations in form or additions of further improvements. For this reason there has been chosen specific embodiments of the lubricant for fitting crowns and bridges as adopted for use in prosthodontic dentistry. These specific embodiments and their method of use have been chosen for the purpose of illustration description in the following detailed description.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The lubricant of this invention is a new compound particularly for use in dentistry and as such must use ingredients which are non-toxic and acceptable to the Federal Drug Administration for use in the mouth of a patient. As the compound may be infrequently used and then in only small amounts it is desirable that the compound have a shelf life of at least a year and preferably for a much greater length of time such as 5 years.

Compounds having such properties include:

| Base Material | Aqualose 95% | Added Color | Zinc Oxide 2% | Bacteriostatic Agent | Neomycin 1% | Anti-Inflammatory Agent | Fluocinolone Acetonide ¼-1/20%
|---------------|-------------|-------------|---------------|------------------|-------------|------------------------|-------------------|

Note: Aqualose is a tradename for Ethoxylated Cholesterol made by Stephan Chemical Company of Maywood, New Jersey. Fluocinolone Acetonide is a fluoride compound made by Syntex Laboratories of Palo Alto, California.

The base materials are manufactured by American Cholesterol Company of Edison, N.J.
plasticized hydrocarbon jell and is easily removed from the restoration and prepared teeth. This material appears to be a superior base material but has been used in experimental tests for only a few months. Other waxes, oils and greaseless compounds can undoubtedly be used instead of the above-suggested base materials; however, it is necessary that they be approved for use in a human mouth and also that they be easily and completely removed from both the restorations and prepared teeth and that said surfaces be easily conditioned for permanent cementation of the restoration.

The bacteriostatic agent above-mentioned is Neomycin sulfate 1 percent. Other agents are also effective in stabilizing the compound and preventing bacterial growth leading to the production of noxious odors, etc. Perhaps the most important function of the bacteriostatic agent is to prevent the proliferation of the acid forming bacteria (acidophilus) which leads to sensitivity and possible decay.

The anti-inflammatory agent described in the preferred embodiment is Flucinolone Acetonide, a synthetic steroid which in very small amount such as less than one-quarter of one percent and as little as one-twentieth of one percent is effective in keeping the inflammation in control. Also usable as an anti-inflammatory agent is hydrocortisone acetate which is available from Merck, Sharp and Dohme of West Point, Penna. 19486. This is also available as "prednisolone" which, as an antiangiogenic drug, is available from McKesson (Division of McKesson & Robbins, Inc. Bridgeport, Connecticut 06602) and also from Rexall Drug Company, Rexall Square, Los Angeles, Cal. 90054. There are many such antiangiogenic drugs now available and these are used in approved ophthalmic and dermatological ointments in dosages similar to the lubricant compound of this invention. The small amount used in the lubricating compound is infinitesimal compared to ordinary dosages prescribed in several medical therapeutics.

USE OF THE LUBRICANT

After the teeth have been prepared in the customary manner and the restoration has been formed in the usual manner such as by casting, the dentist applies a coating of the lubricant of this invention to the mating cavity surfaces of the restoration. Said restorations are customarily tied-in (i.e., inlays and inlay-type or pin-type restorations) or fitted upon the prepared tooth (i.e., a coping or crown-type of restoration). The cast, unfinished restoration, requires adjustments prior to finishing and the lubricant has the twofold purpose of helping to seat the restoration in place as well as to act as an anti-inflammatory agent thereby reducing the sensitivity of the tooth to the mechanical procedure.

Thus the prepared tooth is carefully dried and the restoration is then coated with the lubricant and seated in position. It is known that when a dentist restores even a single jacket crown or inlay it will usually feel high to the patient. This is due to the changes in the proprioceptor impulses of the periodontium. In particular, the change from any temporary crown or restoration (generally a soft material such as acrylic plastic) to the final restoration, which is properly built to the occlusion, will feel strange and high to the patient.

After the restoration is finished and readied for insertion the lubricant of this invention permits a provisional seating of the final restoration to be made and following this test period the strange feeling experienced by the patient for the new restoration usually subsides. This strange feeling is soon accommodated as the neuro-muscular mechanism is retrained to the restored bite relationship caused by the new restoration. The patient, after a short trial period, will report that the restoration is comfortable and any minor adjustments or changes are easily made upon the restoration since it can be easily removed due to the lubricant compound. The restoration can then be refined and/or refinished prior to the final cementation or placement. This technique using one of the lubricants above-described helps obviate the necessity of grinding the occlusal anatomy of the finished restoration in order to remove interocclusal interference (high sports) which are most often caused by incomplete seating of the restoration upon final cementation. It is also noted that the test period of the final restoration provided by this lubricant enables the dentist to observe the gingival response to the new environment provided by the new restoration.

REDUCTION TO PRACTICE OBSERVATIONS

The inventor is a practicing dentist specializing in prosthodontics and oral diagnosis and has made extensive tests of this type of lubricant and has found that his patients greatly appreciate the improved results provided by the lubricant of this invention. Generally, when first seated, subgingival restorations will cause a mild blanching of the marginal gingiva. Supragingival restorations do not manifest the gingival blanching but may show some minor discrepancies such as incomplete seating of one or more retainers. These discrepancies are especially noted in long span splints and bridges wherein one may find some spring or movement of the restoration and perhaps some difficulty in completely seating the fixed prosthodontic appliance.

If the final restoration fulfills all of the requirements of a satisfactory fitting and a good prosthodontic restoration, then the internal surfaces of the appliance are generously covered with the lubricating compound above-noted. This is in lieu of any of the so-called temporary cements or hardening substances. The patient is then instructed to clench the jaws on cotton rolls intermittently for a period of approximately 2 hours and to chew on any non-sticky hard foods normally eaten. The patient is dismissed for a minimum of 24 hours but can go for much longer periods of time; for example, for a period of 72 hours which is a reasonable period for observation and evaluation of the physiological responses. On short spans and individual retainers and crowns a short period such as 24 hours may be used to permit initial examination and minor adjustments after which longer periods can be used once it is ascertained that the patient is comfortable.

After this short test period the bite and contact points can be checked and occlusal adjustments, which are usually minimal, can be made if the original laboratory procedures and bite registrations are carefully performed.

When the restoration is removed the periodontal response can be examined. Impingement or entrapped free gingiva is an indication of a poor fitting retainer. Overextended margins leave telltale clues of inflammatory tissue as the lubricating compound will not mask any faults but will clearly show any possibilities of future failure of the restoration. If the restoration is a sat-
isfactory fit on subgingival retainers, upon removal of the appliance there is clearly outlined the gingival border of the retainer as it fits the tooth. This is manifested by a normal healthy gingival tone and color.

Supragingival retainers where the restoration has fully seated itself shows all margins properly covered and a complete lack of marginal discrepancies. Removal of the appliance is easy to accomplish and replacement poses no problems since the abutment teeth have had an opportunity to align and adjust to the final restoration. The subgingival retainers show that the healthy gingiva follows the outline of the tooth preparation and one can follow the surface epithelium of the marginal gingiva as it follows the internal surface of the gingival sulcus. The dentist can often look into the gingival sulcus which was provided for in the preparation and impression steps. As above-noted the lubricating compound is easily rinsed from the restoration and prepared teeth by lavaging with warm water.

The inclusion of the anti-inflammatory agent as a part of the lubricating compound is a benefit to the patient for all steps in the restoration. The marked effect of desensitizing the prepared tooth by this anti-inflammatory agent facilitates the treatment program during the try-in period of the temporary crowns; the try-in period of the unfinished castings and copings; and finally in the provisional seating of the final finished restoration.

In addition, the active ingredients of the lubricating compound have been found to have a desirable effect upon the gingival tissue which is beneficially treated by the anti-inflammatory agent when the compound is massaged into the tissues surrounding the tooth preparation prior to lavaging with a warm water syringe or having the patient rinse the mouth.

The desensitizing effect of the anti-inflammatory agent upon the pulpal tissue of the prepared tooth facilitates the final cementation technique which utilizes the present formulation of oxyphosphate powder and oxyphosphoric acid liquid. This cement is very irritating to the pulpal tissue and to relieve the pain the dentist often has to give the patient a local anesthetic. The lubricating compound above-described desensitizes the pulpal tissue sufficiently so that the final cementation may be done without undue discomfort from the cement application thus avoiding the use of an anesthetic.

It is to be further noted that lubricant compounds where the lubricant base is a glycol compound may, of itself, provide the necessary bacteriostatic effect so that the added bacteriostatic agent above-noted may be eliminated from the compound which will then have the necessary means to prevent bacterial proliferation in the environs of the mouth.

Conventional mounting of temporary crowns and unfinished restorations with temporary cements result in mountings which are very difficult to remove and may cause pain and/or damage. The lubricant of this invention permits the mounted appliance, whether a temporary crown, an unfinished casting or coping or the final finished restoration, to be easily removed from the prepared teeth. The lubricant prevents the seizure and adherence presently experienced in the use of temporary cements or fillers which "set" up in a period of a few minutes. As the lubricant of this invention does not take a "set" the appliance is easily removed by the dentist with no damage, pain or inconvenience. After ob-

servation of all the fitting factors the dentist removes the lubricant as by a rinse of warm water.

For the convenience of claim definition the term "restoration" includes all prosthodontic appliances such as crowns, caps, inlays and the like above noted. These restorations, conventionally, are cast or otherwise formed and are usually preliminarily fitted to a prepared tooth prior to the step of final cementation. Where a final cementing process is to be employed after the trial fitting adjustments have been achieved, the use of the lubricant of the invention is quite helpful.

This use is particularly beneficial where pain during a trial fitting is encountered.

The method of fitting and trial mounting of a prosthodontic appliance using the lubricant of this invention in fitting of an appliance to prepared teeth includes applying a coating of the lubricant to the internal surfaces of the appliance; mounting and seating the appliance on the prepared teeth and pressing the restoration in place during a trial period; removing the appliance from the prepared teeth and then removing the lubricant from the prepared teeth and appliances as by washing.

While a particular embodiment of the lubricating compound and alternate embodiments have been described it is to be understood the invention is not limited thereto since modifications may be made within the scope of the accompanying claims and protection is sought to the broadest extent the prior art allows.

What is claimed is:

1. A method for the fitting and trial mounting of a restoration on the prepared teeth of a patient, said method including the steps of: (a) preparing the tooth or teeth for mounting and fitting of at least one restoration; (b) preparing the restoration for the fitting to the prepared tooth or teeth; (c) applying a lubrication compound to at least one of the fitting surfaces of the restoration and prepared tooth or teeth so that when the restoration is fitted both fitting surfaces are coated with the lubrication compound, said lubrication compound being a stable, water soluble, nontoxic, non-setting, non-flowing, greaseless base, said compound also including as a portion thereof a bacteriostatic agent and an anti-inflammatory agent; (d) mounting the restoration on the prepared tooth or teeth and pressing to insure the desired degree of seating of the restoration; (e) leaving the restoration on the prepared tooth or teeth for a period of time during which the bacteriostatic agent prevents noxious odor forming bacteria from entering the trial fitting surfaces and the anti-inflammatory agent desensitizing and controlling inflammation of prepared tooth; (f) removing the restoration from the prepared tooth or teeth, and (g) cleaning the lubricant from the prepared tooth or teeth and from the restoration.

2. The method for the fitting and trial mounting of an restoration as in claim 1 in which the base of the lubricating compound is Aquasol about 95 percent.

3. The method for the filling and trial mounting of an restoration as in claim 1 in which the base of the lubricating compound is Solulan 24 about 88 percent and Amerchol L 101 about 10 percent.

4. The method for the fitting and trial mounting of an restoration as in claim 1 in which the base of the lubricating compound is Lipolan about 98 percent.
5. The method for the fitting and trial mounting of an restoration as in claim 1 in which the compound is colored with the addition of 2 to 5 percent zinc oxide.

6. The method for the fitting and trial mounting of an restoration as in claim 1 in which the compound includes 1½ percent or less of an anti-inflammatory agent.

7. The method for the fitting and trial mounting of an restoration as in claim 6 in which the anti-inflammatory agent is Fluocinolone Acetonide and the percentage is less than ¼ of 1 percent.

8. The method for the filling and trial mounting of an restoration as in claim 1 in which the compound includes a bacteriostatic agent which is about 1 percent of the compound.

9. The method for the fitting and trial mounting of an restoration as in claim 8 in which the bacteriostatic compound agent is neomycin.

10. The method for the fitting and trial mounting of an restoration as in claim 1 in which the compound includes an anti-inflammatory agent of 1½ percent or less and a bacteriostatic agent which is about 1 percent of the compound.

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CERTIFICATE OF CORRECTION


Inventor(s) Arthur Milton Bell

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the title, "TRAIL" should read -- TRIAL --.

In the Abstract, line 15, "trail" should read -- trial --.

Col. 1, line 52 and Col. 8, line 58, "trail" should read -- trial --.

Signed and sealed this 22nd day of April 1975.

(SEAL)
Attest:
RUTH C. MASON
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents and Trademarks