This invention relates to means for topical treatment of the teeth and/or gums of a dental patient, and has been found to assure thorough and proper local application of topical agents or medicants to the teeth and gums without the time consuming and arduous task of painting each individual area to be treated with the topical agent.

The primary object of the invention is to provide an improved topical arch tray for topical treatment of the teeth and/or gums with a suitable topical agent, the topical arch tray having generally horseshoe in shape incorporating a trough formed to carry the correct amount of topical agent for proper application to and treatment of the teeth, either upper or lower, or both upper and lower simultaneously.

A further object of the invention is to provide an improved topical arch tray requiring but a few standard sizes to accommodate the oral arches of all age groups.

A further object of the invention is to provide an improved topical arch tray employing a relatively narrow anterior trough and wider contiguous posterior troughs which enables all teeth to be topically treated simultaneously with the correct amount of topical agent whereby to permit only a minimum of disturbing spill-overs of the topical agent into the patient’s mouth.

A further object of the invention is to provide a generally horseshoe shaped topical arch tray preferably formed of a pliable substantially non-absorbent material such as a closed cell polyurethane foam material, the said topical arch tray having a narrow anterior groove or trough and somewhat wider posterior grooves or troughs therein, said groove and troughs being interconnected and having the bottoms thereof formed into a continuous hollow bulbous reservoir to receive and accommodate the proper amount of a topical agent for thorough treatment of teeth or gums with only very little, if any, spillage or external seepage therefrom.

Still another object of the invention is to provide a topical arch tray as aforesaid formed with laterally inwardly disposed bulbous posterior end portions which become positioned, when the topical arch tray is in use, laterally adjacent and in contact with the posterior portion ... in the topical arch tray with a gel form of a topical agent preferably dispensed from a conventional collapsible tube.

FIG. 7 is a cross sectional view through the left maxilla and mandible taken at the bicuspid area showing a pair of topical arch trays, each loaded with a topical agent, and one disposed over each of the upper and lower oral arches of a patient.

FIG. 8 is a cross sectional view similar to FIG. 7 showing the general form taken by the topical arch trays of the invention when the patient closes his bite causing thorough dispersion of the topical agent around the teeth and into the interreantar areas of the gums adjacent the teeth.

Topical arch trays of the invention are used to treat teeth and/or the gums with suitable medicants or topical agents as the particular diagnosis may indicate. Without going into detail with respect to the wide range of topical agents that may be used, one important area of use of topical arch trays is for mass programs of topically applied fluoride to the teeth; for example, in schools, local health departments, as well as in private dental offices.

In such topical programs, the topical arch tray of the invention completely eliminates cotton rolls, cotton roll holders, cotton tipped applicators, presently employed in many standard topical treatment techniques. Also completely eliminated is the necessity to cast or otherwise fabricate or assemble a special arch tray for each patient, which procedure is not only time consuming but in a great majority of cases the specially cast tray is uncomfortable to the patient when in the mouth. In contradistinction to present methods, the topical arch tray is soft, spongy and pliable with no excess bulk or hard corners, and permits either or both arches of the patient to be treated at one time.

The topical arch tray of the invention is disposable after use by each patient, thereby eliminating the necessity for time consuming sterilization of equipment, and its use positively prevents cross contamination between patients.

While the topical agent employed with the topical arch trays of the invention may be in any form, one preferred form is to incorporate the topical agent into a suitable gel. Topical agents in gel dispensed from a tube into topical arch trays of the invention as a topical agent therefor provide for fast and accurate loading of the topical arch tray ready for use. As an example, for topical fluoride treatment, phosphate-fluoride gel of the proper strength and consistency may be loaded accurately into the topical arch tray at room temperature from a conventional collapsible tube.

Referring now to the drawings wherein like reference characters refer to like and corresponding parts throughout the several views, the particular embodiment of a topical arch tray 10 of the invention disclosed for illustrative purposes is preferably formed of a non-absorbent sponge-like material, such as closed cell polyurethane foam, and is generally horseshoe shaped in its top plan view as shown in FIG. 1. The front closed end of the topical arch tray 10 is described herein as the anterior portion 11 while the sides are termed the posterior portions 12. The free inner ends of the said posterior portions 12 are preferably formed laterally wider or bulbous at 13 so that the tongue T of the patient will be contacted by the bulbous free end portion 13 of the lower topical arch tray 10 as it is employed to treat the lower teeth L of a patient. These widened or bulbous portions 13 of the posterior portions 12 of the topical arch tray 10 may be of any desired shape that will aid in sealing off saliva of the patient during a topical treatment from that portion of the patient's oral cavity forwardly of the patient's rearmost teeth.

The top of the topical arch tray 10 as viewed in FIG. 1 is provided with downwardly disposed medicant carrying grooves 110 and 120 therein at the anterior and posterior portions 11 and 12 respectively thereof. The said medicant
carrying grooves 110 and 120 are preferably disposed substantially laterally central in said anterior and posterior portions 11 and 12 of the topical arch tray 10. The medicant grooves 120 in the posterior portions 12 of the topical arch tray 10 stop part of the free inner edge of the said posterior portion 12, providing abutments 14 which prevent the spilling out of medicant from the inner ends of said medicant grooves 120.

A suitable reservoir 1100 is preferably provided at and along the base of the anterior groove 110 in the anterior portion 11 of the topical arch tray 10. Likewise, a suitable reservoir 1200 is preferably provided at and along the base of the posterior groove 120 of the posterior portion 12 of the topical arch tray 10. The said reservoirs 1100 and 1200 communicate endwise to provide, in effect, a continuous reservoir along the bottoms of the anterior groove 110 and the posterior grooves 120 of the topical arch tray 10, see FIGS. 4 and 5.

When using a gel type topical agent, the reservoirs 1100 and 1200 at the base of the anterior and posterior grooves 110 and 120 respectively of the topical arch trays 10 are preferably filled with a schematically conventional collapsible tube 15 or the like. FIG. 6 illustrates how gel type topical agent or medicant 150 may be placed into the reservoir 1200 at the base of a posterior groove 120 from a conventional collapsible tube 15. Obviously, other means may be employed to fill the reservoirs 1100 and 1200 and/or the anterior and posterior grooves 110 and 120 respectively with gel base or other types of topical agents.

When a topical arch tray 10 has its reservoirs 1100 and 1200 suitably filled with the required topical agent, the topical arch tray is telescoped by a dentist or dental hygienist onto and over either the upper or lower teeth, U or L, of a patient P with the teeth U or L and adjacent portions of the gums G of the patient disposed within the anterior and posterior grooves 110 and 120, see FIG. 7. A second topical arch tray 10 is then telescoped onto and over the other of the upper or lower teeth, U or L, of the patient. It will be noted that substantially all of the gel type topical agent or medicant 150 still remains in the reservoirs 1100 and 1200 after initial placement of loaded topical arch trays 10 on the upper teeth U and/or lower teeth L of the patient.

The dentist or dental hygienist next presses the topical arch trays 10 firmly against the top of the teeth to distribute the topical agent 150 over and around the teeth and into the crevices at the gums adjacent the teeth, and the patient is then requested to close his bite gently but firmly, and hold his bite closed. This causes the topical agent 150 to remain distributed over and around the teeth and into the crevices at the gums adjacent the teeth, and assures proper and thorough topical treatment of the teeth and/or gums adjacent thereto with a selected topical agent. When the patient has closed his bite, the topical arch trays change their shape and form from that shown in FIG. 7 to a shape and form substantially as shown in FIG. 8. The patient’s bite remains closed for the length of time required for the particular topical treatment being given; for example, for three to five minutes is generally required to accomplish a normal topical fluoride treatment with a conventional strength topical agent. When the topical treatment is completed, the topical arch trays 10 are removed and disposed of. The patient is then instructed as to the proper length of time to avoid rinsing the oral cavity prior to taking water or food.

Complete instructions for the use of topical arch trays for fluoride treatment are preferably as follows:

1. Clean teeth in routine manner.
2. Air dry teeth.
3. Fill the reservoirs of two topical arch trays with a phosphate-fluoride gel.
4. Insert one topical arch tray over the teeth of each of the upper and lower arches, pressing them lightly in place so that all teeth are covered by the tray covered by the trays.

5. Instruct patient to bite lightly but firmly on the topical arch trays, and to keep his bite closed; for example, for four minutes, or whatever period of exposure of the teeth to the particular topical agent employed may be required.

6. After the proper period of exposure to the topical agent has elapsed, remove and discard the topical arch trays.

7. Instruct the patient to refrain from any oral intake for a period to assure the desired continued exposure of the teeth to the topical agent remaining on the teeth or in the crevices between the teeth and the gums; for example, thirty minutes.

From the foregoing, it will be observed that the instant invention provides a positive acting topical arch tray for fluoride or other medical treatment of the teeth including those difficult to reach areas in the crevices between the teeth and between the teeth and the gums. Topical arch trays of the invention are extremely economical, and by use in thousands of cases in mass or group topical treatment of the teeth, the results with the improved topical arch trays have been found to be superior to and more economical than conventional hand painting of the teeth or the use of other prior art devices heretofore employed which have been more expensive to use and also have provided less than thoroughly satisfactory results.

Although but a single embodiment of the invention has been disclosed and described in detail herein, it is obvious that many changes may be made in the size, shape, arrangement and detail of the invention, all without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A topical arch tray for use in topical treatment of the teeth and/or adjacent gum areas of a dental patient comprising:
   a resilient substantially non-absorbent element of a sponge-like pliable material generally horseshoe shaped having a front closed anterior portion and contiguous side posterior portions with free inner ends,
   the said anterior and posterior portions having a continuous vertical groove formed in the top thereof formed to accommodate a topical agent and receive nearly a patient’s teeth, said groove having a substantially wider lateral dimension at said posterior portions than at said anterior portion, the said groove terminating short of the free ends of said posterior portions,
   the said anterior and posterior portions having a continuous reservoir formed at the bottom of said groove, said reservoir communicating continuously and uninterruptedly with said groove over the full length thereof.

2. A topical arch tray for use in topical treatment of the teeth and/or adjacent gum areas of a dental patient comprising:
   a resilient substantially non-absorbent element of a sponge-like pliable material generally horseshoe shaped having a front closed anterior portion and contiguous side posterior portions with free inner ends,
   the said anterior and posterior portions having a continuous vertical groove in the top thereof formed to accommodate a topical agent and receive nearly a patient’s teeth, the groove having a larger lateral opening at said posterior portions than at said anterior portion, the said groove terminating short of the free ends of said posterior portions,
   the said anterior and posterior portions having a continuous reservoir formed at the bottom of said groove therein, said posterior end portions of said element extending laterally inward to form a laterally widened end portion.
3. A topical arch tray for use in topical treatment of the teeth and/or adjacent gum areas of a dental patient comprising:

- a resilient pliable substantially non-absorbent closed cell polyurethane element generally horseshoe shaped having a front closed anterior portion and contiguous side posterior portions with free inner ends,
- the said anterior and posterior portions having a continuous vertical groove formed in the top thereof formed to accommodate a topical agent and receive neatly a patient's teeth, the groove having a larger lateral opening at said posterior portions than at said anterior portion, the said groove terminating short of the free ends of said posterior portions,

5 the said anterior and posterior portions having a continuous reservoir formed at the bottom of said groove therein, said posterior end portions of said element extending laterally inward to form a laterally widened end portion.

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