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## DENTAL HYDROCOLLOID SYRINGE

Morris J. Thompson, Los Angeles, Calif.

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2 Claims. (Cl. 128—215)

This invention relates to dental hydrocolloid syringes, and more particularly to the production of syringes adapted for the handling of dental hydrocolloids used in the making of impressions.

This application is a continuation-in-part of my application, Serial No. 305,488, filed November 21, 1939, for Method of and apparatus for taking an impression of a cavity for dental inlay.

In the handling of dental hydrocolloids it is necessary to have syringes which will enable the dentist to utilize the material in fluid condition and in such manner as to avoid the separation of the materials composing the hydrocolloids and in such manner as to deliver the portions of the hydrocolloid to be utilized to the points where they are required at the requisite fluidity to enable the hydrocolloid to reach all portions of the cavity. Particularly in the making of inlay impressions using such hydrocolloids it is necessary or desirable to provide a syringe which will enable the hydrocolloid to be injected directly into the cavity irrespective of its position within the mouth.

It is therefore an object of this invention to provide a syringe in which the hydrocolloid may be maintained at the desired fluidity and against the possibility of contamination and which syringe has a rather fine discharge needle extending from its side permitting ejection of the hydrocolloid into cavities situated in the back part of the mouth and next to the cheek.

Another object of this invention is to provide a syringe applicable for the handling of dental hydrocolloids which has a short discharge needle extending from its side whereby there is provided a relatively short length of discharge passage enabling the hydrocolloid to be injected into the cavity in the required fluid condition.

Another object of this invention is to provide a syringe in which a hydrocolloid may be conditioned for use.

Another object of this invention is to provide a dental hydrocolloid syringe which provides a means for the dispensing of small portions of hydrocolloid under the required condition of fluidity.

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 drawing.

In the drawing:

Figure 1 is a sectional elevation of a dental hydrocolloid syringe embodying my invention illustrating as detached therefrom closing caps uti-

lized in the production of the syringe and for maintaining a definite fluid-tight closure for the injection needle, the syringe being illustrated in broken length and of an enlarged size for the purpose of illustration.

Figure 2 is a sectional end view taken substantially on the line 2—2 of Figure 1, and enlarged to about twice the size thereof.

In the embodiment of my invention as illustrated in the accompanying drawing, the syringe is composed of a cylindrical barrel 1 which may be a section of a brass or other metal tube to which there is suitably secured a heat-retaining metal head 2 having a discharge passage 3 formed partially therethrough in the direction of the longitudinal axis of the tube 1 and an angled passage 4 extending at an acute angle forwardly with relation to the axis of the barrel 1. The head 2 is frusto-conical with its sides substantially perpendicular to the passage 4. Mounted in the passage 4 is a plug 6 threaded as indicated at 7 and carrying a fine injection needle 8.

The syringe structure as thus formed is then covered with a rubber covering 10 which is molded around the barrel 1 and head 2 below the thread 7 as limited by the position of the cap 9 forming on the face 5 a closure seat 11. There is also molded with the cover 10 a finger flange 12 spaced inward along the syringe from the open end thereof. A permanent closure cap 13 is provided which is threaded as indicated at 14 to permit the same being threaded upon the threads 7 of the plug 6. The cap 13 has the lowermost thread removed providing an annular closure flange 15 which seats upon the rubber seat 11 maintaining a fluid-tight connection. As the cap 13 is screwed to the end of the threads 7 further screwing of the cap 13 down is arrested, thereby preventing destruction of the seat 11.

Mounted within the barrel 1 is a plunger 16 which may be of any suitable, or desirable construction. As herein illustrated, the plunger 16 is formed with a core 17 threaded to receive a rod so that it may be suspended in a mold during which a rubber covering 21 is molded thereon, forming a head 20 of larger diameter than the remaining portion of the plunger 16. The threaded end of the plunger is then filled with a screw 19. As the covering 21 is molded upon the plunger 16, there is also molded thereon the actuating flange or head 24 which provides the means for gripping the plunger to enable the same to be moved in or out of the barrel 1.

The syringe as thus formed provides a means within which the hydrocolloid may be heated to

attain the desired fluidity for the making of inlay impressions. The positioning of the injection needle 8 at an angle forward from the axis of the syringe enables the direct injection of fluid hydrocolloid into any inlay cavity irrespective of its position within the mouth or adjacent the cheek of the patient.

It will be apparent from the foregoing that the injection passage formed by the passages 3 and 6 is relatively short and that as the head 2 is formed of heat-retaining metal it will retain for a greater period of time the heated condition required for maintaining the hydrocolloid at the temperature required for maintaining the necessary fluidity. The formation of the conical head 2 with the needle 8 extending at substantially right angles from the side of the head enables me to project the needle beyond the end face 2<sup>a</sup> in such manner that the needle may be inserted into any cavity prepared for inlay.

The part of the passage which is exposed to the atmosphere out of the syringe 1 as, for example, through the needle 8, is short so that little opportunity is permitted for the hydrocolloid to gel during injection. Projecting the needle 8 forward at an angle and from the side of the conical section, makes possible the introduction of the needle 8 into inlay cavities with a minimum of interference.

The syringe embodying my invention as herein illustrated is primarily for the purpose of injecting hydrocolloids into cavities for the purpose of making impressions for the production of inlays and provides also a dispensing instrument within which the hydrocolloid is conditioned as to temperature and fluidity as set forth in my copending application, Serial No. 305,488, hereinabove referred to.

The needle 8 has a fine discharge aperture therethrough preferably between the range of a 10 and 25 gauge needle, enabling the careful handling of the very small quantities of hydrocolloid required.

As the syringe forms the means within which the hydrocolloid is conditioned, it is essential that the aperture formed through the needle 8 be closed to prevent interchange of fluid as the

syringe is immersed in a container of heated water to bring the hydrocolloid contained therein to the desired fluidity.

The angle of the needle 8 as illustrated has been found particularly advantageous in reaching any inlay cavity in any tooth however any acute angle from the axis of the syringe may be employed with a lesser degree of efficiency. In reaching the back molars or wisdom teeth for such injections, it is advisable that the end of the needle 8 project near the forward end of the syringe in order to permit the injection to be made with a minimum of contact of the heated syringe with the interior of the mouth.

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 dental hydrocolloid syringe, the combination of a cylinder, a plunger mounted to reciprocate in the cylinder, the cylinder having a frusto-conical head mounted at one end, a passage formed through the head, the passage having a section extending at substantially right angled through the side of the frusto-conical head, and a relatively fine discharge needle mounted in and extending from the discharge passage to a point in advance of the frusto-conical head.

2. In a dental hydrocolloid syringe, the combination of a cylinder formed of a tube and having a frusto-conical head secured to the discharge end of the tube, the passage formed through the head emitting in a direction substantially at right-angles to the side of the frusto-conical head, a discharge plug threaded in the discharge passage and having a fine needle discharge which extends to a point in advance of the frusto-conical head, a cap member adapted to be threaded to the plug, said cap member having its end threads removed whereby threading of the cap upon the plug to jam the threads is prevented, and the cylinder having a covering thereover, said covering having an extended grip flange.

MORRIS J. THOMPSON.