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TEMPERATURE CONDITIONING PLATE
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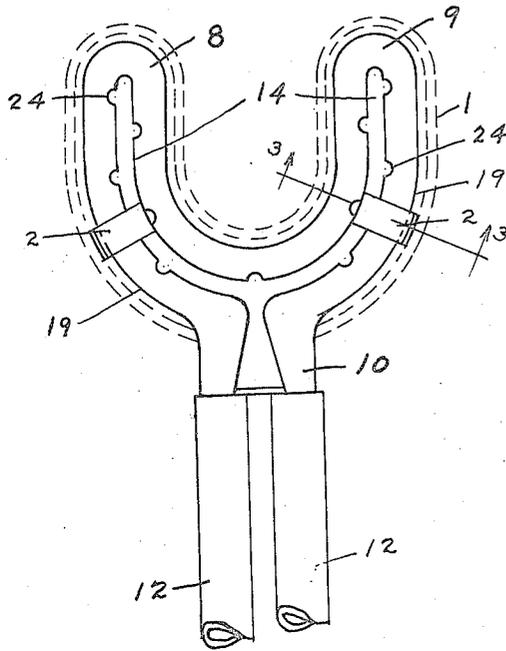


FIG. 1.

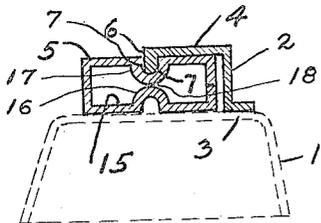


FIG. 3

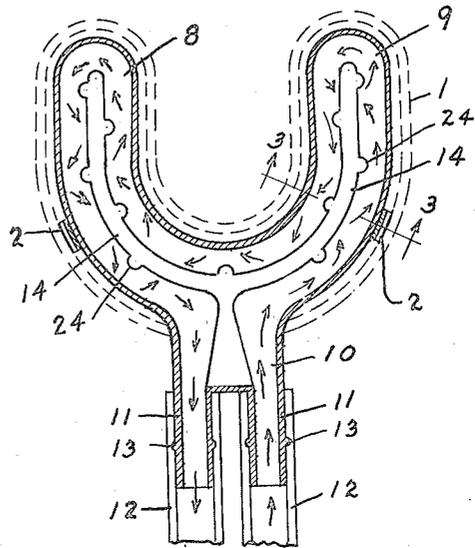


FIG. 2.

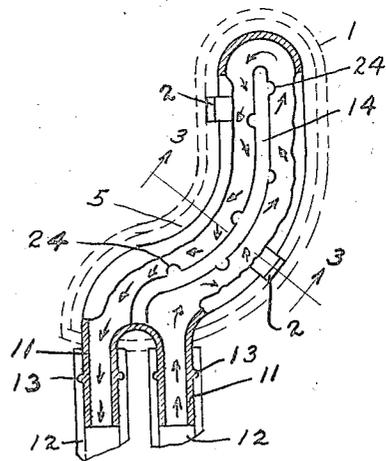


FIG. 4.

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TEMPERATURE CONDITIONING PLATE

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3 Claims. (Cl. 32-17)

This invention refers to dental trays and more particularly to an attachment to the same for controlling the temperature. It has among its objects, to provide a temperature conditioning plate designed to permit suitable circulation of a medium inside of the plate for controlling its temperature and that of the dental tray to which it is secured; to have such conditioning plate assembled as a separate unit capable of facile attachment to the tray; to have the conditioning plate so arranged that it may be adjustably positioned on the tray to suit any particular condition that would warrant such adjustment. Further objects are to provide for positive circulation of the heating or cooling medium in the conditioning plate and prevention of any stagnant spots, as well as permit its construction in a standard form applicable to a general type of dental tray.

The conventional dental tray is used for holding the moulding material used for making the matrix form of a patient's mouth or dental work, and sustaining it in position until the impression is properly secured. The temperature of the moulding material should be kept under control to suit the material used for the purpose. By doing so, the material is kept in the fluid or plastic form desired for any step of the process. While cooling and heating arrangements have been provided in the past, such have been provided in the tray itself, by modifying its construction to provide a hollow structure.

The removal of the tray in such cases is interfered with, and causes difficulties that more or less hamper the dentist in his work. The weight of the tray itself is increased and the temperature varies throughout the tray by reason of the cooling or heating medium being in the tray. This sets up stresses which are non-uniform as well as making it more or less uncomfortable to the user or patient.

In this invention, the tray is of conventional form, and is fitted to the patient in the most convenient manner. The conditioning plate is attached to the tray and works freely and independently of same. The medium is circulated through the plate which is made hollow for the purpose, and through its conductor casing heats or cools the tray and its moulding material accordingly, through the conducting material that the tray is made of. The circulation in the conditioning plate is disturbed sufficiently by means of baffles suitably placed in it, to stir up the medium as it circulates. The construction of the plate is such as to make it economical as well as strong. It can be readily attached to the tray, and in such

attachment arranged to be free for positioning adjustably without affecting its efficiency.

In the drawing which shows an embodiment of this invention:

Figure 1 is a plan view of a conditioning plate shown applied to a dental moulding tray,

Figure 2 is a sectional plan through Figure 1,

Figure 3 is a sectional cross-section through the conditioning plate along the line 3-3,

Figure 4 is a modified form of the conditioning plate adaptable for use in bridge-work dental construction and indicated partly broken away to show its interior construction.

Similar reference characters refer to similar parts throughout the drawing.

A conventional form of dental moulding tray is provided with extension clips 2 projecting from the bottom 3 of the tray. These clips having an arm 4 adapted to engage with the upper surface 5 of a conditioning plate and a pending lip 6 to fit a groove 7 to be referred to later.

The conditioning plate is preferably of metal formed in a quasi-horseshoe shape with legs 8 and 9, the construction being hollow as indicated in Figure 3. The upper portion of the conditioning plate is shown at 5 and its lower portion at 15. The base 10 is extended to afford a suitable handling portion in which the piping attachments 11 are secured. Rubber tubing 12 is preferably mounted and connected with the piping attachments, and the bosses 13 serve to keep same from being pulled off. The interior construction of the conditioning plate is provided with a middle barrier 14 which is formed by crimping the metal into the form shown in Figure 3. In this crimping, the metal is formed into two U-formed legs 16 and 17 brought together at 18. The leg 17 is so lapped that a groove 7 is provided in it for the pending lip 6, and serves to keep the conditioning plate in place on the tray. The legs 8 and 9 have their exterior peripheral walls 19 formed on a circular curve, and the clips 2 are likewise arranged to cooperate with such. This arrangement permits the conditioning plate to be rotated on its face in the same center as the tray, and gives freedom to assume a number of positions. This positioning permits the dentist to position the medium feeding tubes 12 out of the way, and towards either side of the mouth of the patient so that he may have more facile access to the mouth and tray. When the tray is removed from the mouth the doctor can readily detach the conditioning plate and place it where he prefers, leaving the conditioning plate ready for use again immediately.

The barrier 14 is provided with a series of baffles 24 which tend to stir up the medium as it circulates through the plate in the direction of the arrows and make the medium more effective.

5 In the use of the device, the conditioning plate is placed on the dental moulding tray and secured by the clips 2. The whole device with the moulding material is placed in the mouth of the patient. The circulation of water, which is preferably
10 used, is then provided through the legs 8 and 9 in the direction of the arrows. The temperature and heat of the water heats or cools the moulding material through conduction through the metal casing or walls of the plate and tray, and the material is brought to the desired degree of heat and
15 incidental fluidity or stiffness. At the proper moment, the mould is cooled and the tray with plate is removed. The conditioning plate is then detached from the clips and left at the dental
20 table, while the tray is taken to the laboratory for further work. The construction of the conditioning plate is not only strong but affords a very efficient manner of taking up the heat in the medium used within it. The use of the circular construction on the barrier and the peripheral walls
25 of the conditioning plate serve to enable the device to work through a considerable range and easily adapted for standard sizes.

30 In the form indicated in Figure 4, the construction is in general similar, but limited to a portion of the mouth in order to have it adaptable for bridgework or smaller or malformed mouths. The same features applicable to the prior forms are obtained in this form.

35 While but two forms of the invention are shown in the drawing, it is not desired to limit this application for patent to these constructions, except as limited by the prior art, as it is appreciated that other forms could be made that would embody the same principles and come within the scope of the
40 appended claims.

Having thus described the invention, what is claimed is:—

1. In combination with a dental moulding tray of the class described, having a clip with a pending lip attached thereto, a conditioning plate having a plurality of annular internal passages therein all connected together, the upper and
5 lower walls of the plate being depressed in a U-shaped crimp to meet each other tightly and form internal barrier walls between the said passages and an external groove adapted to receive the said pending lip and cause the plate to be
10 locked to the tray, and piping means for connecting the passages.

2. In combination with a dental moulding tray of the class described, having a Z-like clip with a pending lip, a conditioning dental plate having a
15 U-like structure arranged to rest closely against the dental moulding tray, the upper and lower walls of the plate structure being internally depressed together to meet each other in close contact in a double walled U-form construction hav-
20 ing a U-form groove formed exteriorly in same to permit internal expansion and contraction, the groove being adapted to receive the pending lip and form a locking connection between the tray and plate aforesaid, and piping connections for
25 connecting the passages with tubing.

3. In combination with a dental moulding tray of the class described having Z-like clips with pending lips attached thereto, a conditioning dental plate with a quasi-horseshoe structure with
30 legs extending therefrom, the structure being hollow throughout, a barrier wall formed in the interior hollow portion to provide a continuous separated passage therethrough, said barriers being provided with a plurality of spaced vertical
35 baffle members and grooves internally and externally respectively, to provide expansible reactions in the structure and wall, said barrier wall being formed with exterior grooves therein to receive said pending lips, a handle for the plate and
40 piping connections therefor for the said passage.

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