Aug. 18, 1959 G. F. McGOWAN 2,899,707

DENTAL FLASK

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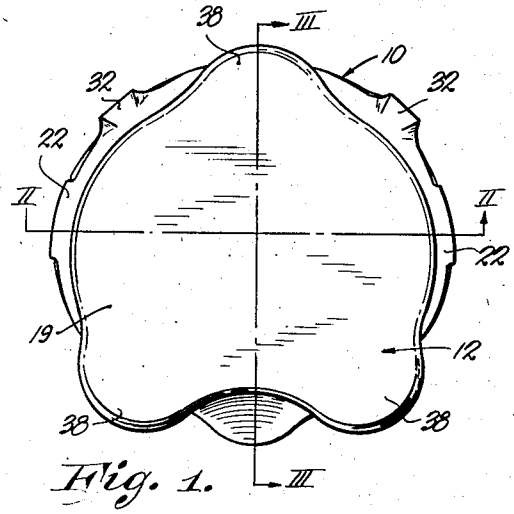


Fig. 1.

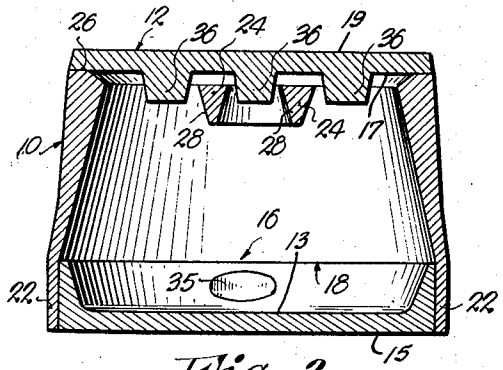


Fig. 2.

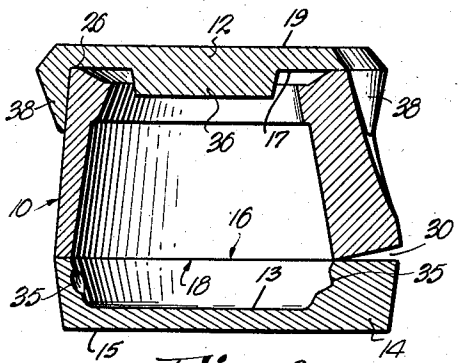
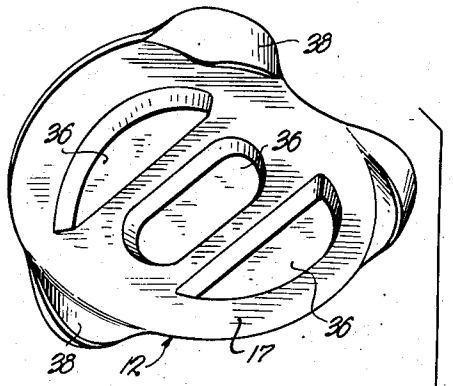
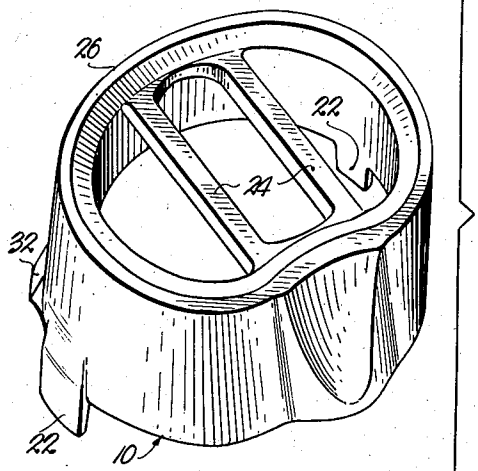


Fig. 3.





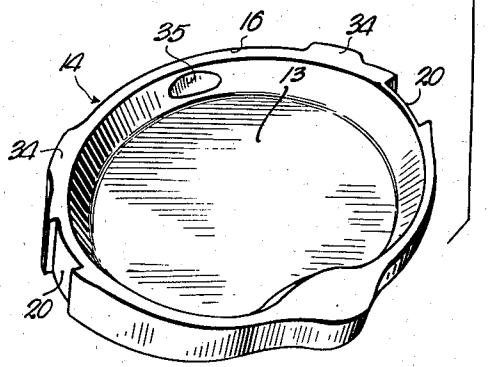


Fig. 4.

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DENTAL FLASK

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6 Claims. (Cl. 18—33)

This invention relates to prosthetic dentistry, and more particularly to the manufacture of partial or complete dentures, the primary object being to provide an improved dental flask capable of being employed in essentially the same manner as conventional structures of this character but adapted, when placed in use, of eliminating problems incident to localized pressures which result in deformation of the appliance being produced.

It is the most important object of the present invention to provide an improved dental flask which, when properly used as contemplated hereby, is capable of assuring the manufacture of a well fitting appliance conforming accurately to the positive model upon which it is made.

Another important object of the instant invention is to provide a dental flask which may be placed under pressure in the conventional manner to hold the sections of the flask together during polymerization of denture base material in a manner to obviate adverse effects of the pressure upon the investment and, therefore, upon the appliance that is molded within such investment.

It is a further object of the instant invention to provide a dental flask having novel means for holding the investment in place during curing of the denture base material but which means is so disposed as to receive no pressure during the holding of the flask sections together, thereby preventing maladjustment of the artificial teeth with respect to the denture base material and obviating also improper conformation of the said material with respect to the positive cast upon which the same is being formed during the curing step of the process.

A still further object of the instant invention is to provide an improved dental flask that eliminates the necessity of providing a closure section on one end of the primary median section.

Another object of the present invention is to provide a flask section that is adapted primarily for use in a novel manner to facilitate removal of the investment, but which may also, if desired, be used as a closure member as just above indicated.

In the drawing:

Figure 1 is a plan view of a dental flask made according to my present invention.

Fig. 2 is a cross-sectional view taken on line II—II of Fig. 1.

Fig. 3 is a cross-sectional view taken on line III—III of Fig. 1; and

Fig. 4 is a stretched-out, exploded perspective view showing the three sections of the dental flask.

While the flask illustrated in the drawing is composed of a primary intermediate section **10**, a combination end section and ejector **12** and an end section **14** for the open ends of section **10**, the invention contemplates essentially the provision of a two-section dental flask as distinguished from conventional devices of this character wherein it has heretofore always been deemed necessary to close both

ends of the section **10** during use thereof in producing artificial appliances for the mouth.

Those skilled in this art are familiar with the steps commonly employed in the manufacture of artificial dental appliances and while the principles of the instant invention will hereinafter be outlined in accordance with the procedures to be employed for the manufacture of complete dentures, it is understood that such principles apply equally well to the production of partial dentures and other types of artificial restoration.

Accordingly, in the usual manner, a negative impression of the user's mouth will be taken and from which is produced a positive model, pattern or cast.

Normally, a suitable composition is employed in the shaping of a base plate over the model, whereupon artificial teeth are mounted on such base plate following which the dentist will normally adjust the teeth within the base plate by a trial fit in the mouth of the user. Thereupon, the permanent denture is produced by use of the dental flask shown in the drawing. The aforementioned base plate is thereupon attached to the model through use of a removable substance such as wax, and the cast is invested within a suitable casting or molding material. Such initial casting operation is carried out within flask section **14** and to this end, it is noted that section **14** is provided with notches or undercut portions **35** for retaining the investment therewithin. Section **14** is in the nature of a relatively shallow, flat plate adapted to close the larger open end of frusto-conical primary flask section **10**, and is provided with an innermost face **13** and an outermost face **15**. Section **12** is also provided with an innermost face **17** and an outermost face **19**. Section **14** is provided with a continuous, relatively narrow, flat edge **16** that bears directly against a similar edge **18** at the larger open end of section **10** in abutting relationship thereto. When sections **10** and **14** are so relatively disposed, opposed notches **20** in the section **14** are received by corresponding downturned ears **22** integral with the section **10**.

After the investment receiving the positive model has hardened, the attached base plate, together with the artificial teeth mounted thereon, are invested within a molding or investment material within the flask section **10**, it being seen that such investment material may be easily poured into the section **10** through the smaller open end thereof while the sections **10** and **14** are together. Before pouring molding investment into section **10**, a suitable separating medium is applied to the hardened investment surface exposed in section **14**, so as to facilitate the separation of sections **10** and **14** during further processing.

In accordance with the principles of the instant invention, it is to be preferred that the level of such investment material be coincident with the outermost face of bridge means in the nature of a pair of bridges **24** spanning the distance across the section **10** therewithin and substantially diametrically thereof adjacent the smaller of the two open ends of section **10**. It is to be particularly noted that the bridges **24** are spaced inwardly from outermost flat, continuous edge **26** of section **10**, which edge incidentally is not only parallel with the edges **16** and **18**, but parallel with the outer faces **19** and **15** of both sections **12** and **14** respectively when the latter are mounted on the intermediate section **10**. The ultimate removing of the investment from the section **10** is facilitated not only by the frusto-conical interior configuration of section **10**, but by the substantially triangular, cross-sectional contour of the bridges **24**, as seen in Fig. 2 of the drawing. In this respect, the sides **28** of each of the bridges **24** diverge as the outer most faces of bridges **24** are approached.

Following the hardening of the investment within the section 10, the two sections 10 and 14 are separated and the wax forming the base plate is removed, leaving the model in its initial condition invested within section 14 and leaving the teeth firmly embedded within the investment contained by section 10. The investment in section 10 is thereupon normally coated with a conventional separating medium to facilitate removal of the completed denture following which the same is packed with a polymeric denture base material covering that portion of the exposed teeth, together with any indentations, sockets and metal pins embedded so as to secure their permanent attachment to the finished denture. Thereupon, the flask sections 10 and 14 are reassembled and compressed tightly together in any suitable manner so as to cause the denture base material to distribute evenly over the cast and conform to the configuration thereof during polymerization.

A conventional press may be utilized for such purpose having a base receiving the edge 26 of the section 10 and a ram for example, that bears against the outermost face 15 of section 14. It is during this stage of the technique that the novel construction of the flask illustrated in the drawing, becomes most important. By virtue of the fact that the investment within the section 10 is spaced from the edge 26, the pressure that is exerted in the press to hold the sections 10 and 14 together, is not exerted upon the investment. By the same token however, the bridges 24, together with the frusto-conical configuration of the section 10, prevent undue movement of the investment, forcing the denture base material to set in accordance with the configuration of the pattern and in precise shape and thickness to the base plate previously removed.

After hardening of the denture base material, the section 14 is pried loose from the section 10 by insertion of a suitable wedging implement within a notch 30 formed between the sections 10 and 14. A number of protuberances 32 and 34 provided on sections 10 and 14 respectively to further facilitate the prying apart of these two flask sections.

The investment within the section 10 may be removed in any suitable manner, but to facilitate such operation, flask section 12 is provided with a plurality of extensions or protuberances 36 on face 17 thereof having thicknesses greater than the distance between the inner face 17 of section 12 and the outer faces of bridges 24 when the section 12 is assembled on the section 10 in the manner illustrated by Figs. 2 and 3 of the drawing. Consequently, by virtue of the fact that the section 14 has been removed and its refuse investment content including the impression model eliminated, then the section 14 replaced in its correct relation to section 10, it is but necessary to apply pressure to the outer face 19 of section 12 to force the protuberances 36 against the investment and thereby force the latter outwardly through the larger open end of section 10 into the empty receptacle section 14 sufficiently so as to dislodge the investment from the section 10.

Figures 2 and 3 of the drawing illustrate the way in which the protuberances 36 are spaced to clear the bridges 24 during such investment-removal step. It is to be noted that section 12 is provided with a plurality of wings 38 that embrace the section 10 and thereby hold the section 12 in proper relationship to the section 10 during the removal of the investment.

It is seen from the foregoing, therefore, that the dental flask is essentially a two-section flask since the section 12 is not essential to the steps of producing the appliance and it is contemplated that section 12 will only be used for investment-removal purposes as just above described.

It is possible, however, to use the section 12 as a closing means for the smaller end of the section 10 during the polymerization step if desired. However, it is submitted that the use of section 12 as a closing means is recommended only when using the flask for generally used denture repair technics.

From the foregoing, it is appreciated that the gist of the invention lies in elimination of pressure upon the investment during setting, hardening, or curing of the denture material, since in conventional structures such pressure upon the investment itself oftentimes results in improper fit. By virtue of the space that is provided between the edge 26 and the level of investment within the section 10, such pressures upon the investment are eliminated when utilizing the dental flask of the nature above described.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. In a dental flask, a tubular section having a pair of opposed, open ends; a closure section for one of said ends; investment-retaining bridge means across the other of said ends; and a pressure-receiving edge on the tubular section at said other end thereof spaced outwardly from the bridge along the axis of said tubular section.

2. In a dental flask, a substantially frusto-conical, tubular section having a pair of opposed, open ends; a closure section for the larger of said ends provided with an outermost face and an innermost face; investment-retaining bridge means secured to the tubular section therewithin diametrically across the smaller of said ends; and a continuous, pressure-receiving edge on the tubular section at said smaller end thereof, spaced outwardly from the bridge and parallel with said outermost face of the closure section.

3. In a dental flask, a substantially frusto-conical, tubular section having a pair of opposed, open ends; end sections for said ends, each provided with an outermost face and an innermost face; investment-retaining bridge means secured to the tubular section therewithin diametrically across the smaller of said ends; and a continuous, pressure-receiving edge on the tubular section at said smaller end thereof, spaced outwardly from the bridge and parallel with said outermost faces of the end sections.

4. In a dental flask, a substantially frusto-conical, tubular section having a pair of opposed, open ends; a closure section for the larger of said ends provided with an outermost face and an innermost face; a pair of spaced investment-retaining bridges secured to the tubular section therewithin diametrically across the smaller of said ends; and a continuous, pressure-receiving edge on the tubular section at said smaller end thereof, spaced outwardly from the bridges and parallel with said outermost face of the closure section.

5. In a dental flask, a substantially frusto-conical, tubular section having a pair of opposed, open ends; a closure section for the larger of said ends provided with an outermost face and an innermost face; a pair of spaced investment-retaining bridges secured to the tubular section therewithin diametrically across the smaller of said ends; and a continuous pressure-receiving edge on the tubular section at said smaller end thereof, spaced outwardly from the bridges and parallel with the said outermost face of the closure section, said bridges each being substantially V-shaped in transverse cross section, terminating in relatively narrow innermost edges.

6. In a dental flask, a substantially frusto-conical, tubular section having a pair of opposed, open ends; an end section over the larger of said ends and provided with an outermost face and an innermost face; investment-retaining bridge means secured to the tubular section therewithin diametrically across the smaller of said ends; a continuous, pressure-receiving edge on the tubular section at said smaller end thereof, spaced outwardly from the bridge and parallel with said outermost face of the end section; an ejector over the smaller of said ends and having an outermost face and an innermost face; and inwardly extending means on said innermost face of the ejector for forcing investment from the tubular section

when the investment is substantially flush with the outermost face of the bridge means.

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