April 14, 1953 H. L. McADOO 2,634,500

DENTAL IMPRESSION TRAY

Filed April 19, 1951 2 SHEETS—SHEET 1

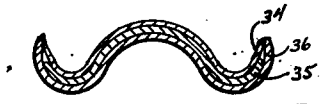


Fig. 6.

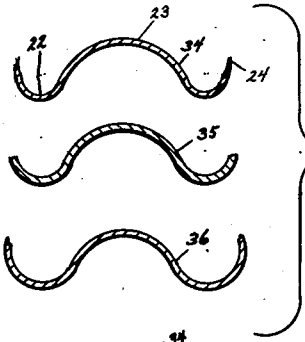


Fig. 7.

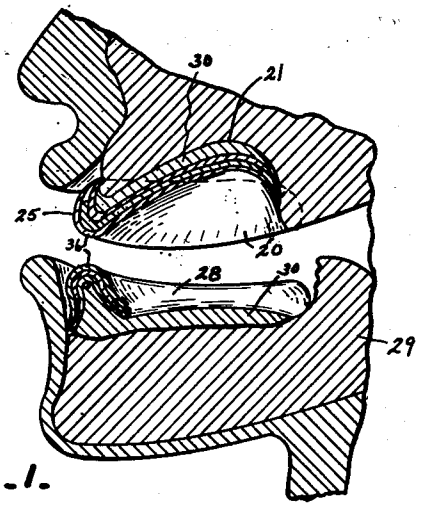


Fig. 1.

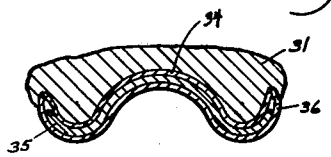


Fig. 4.

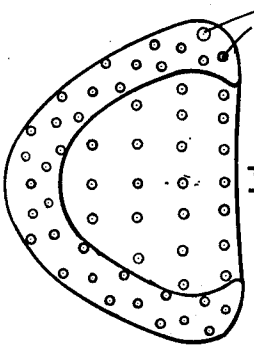


Fig. 2.

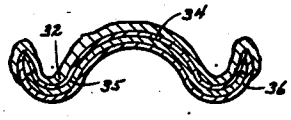


Fig. 5.

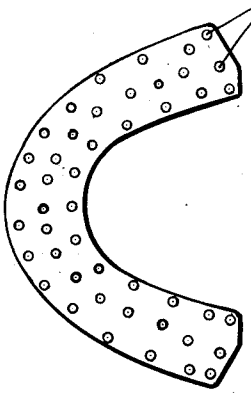


Fig. 3.

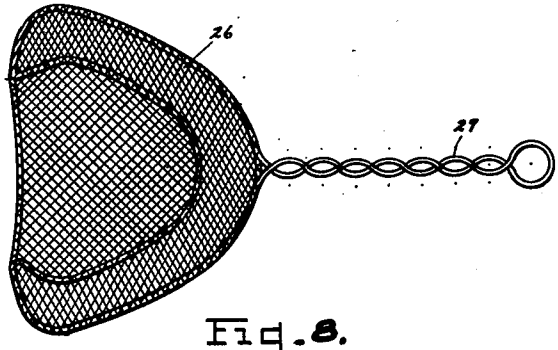


Fig. 8.

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DENTAL IMPRESSION TRAY

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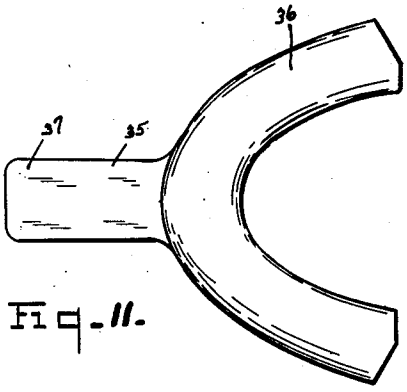


Fig. 11.

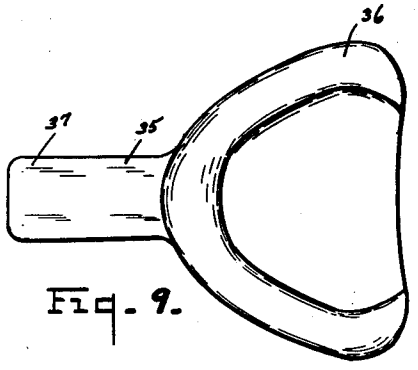


Fig. 9.

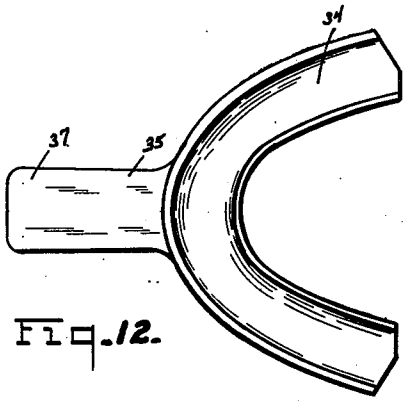


Fig. 12.

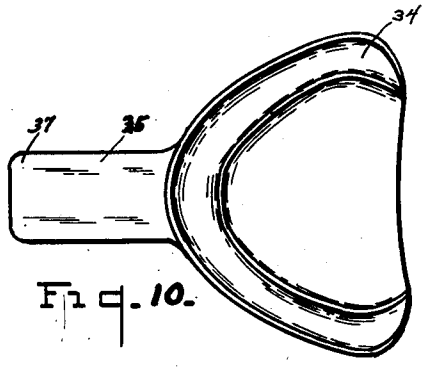


Fig. 10.

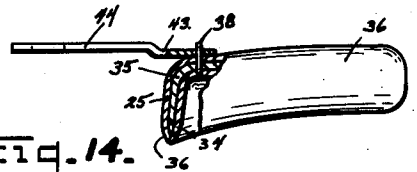


Fig. 14.

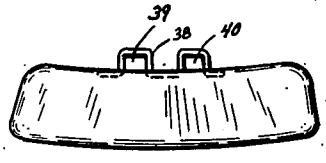


Fig. 15.

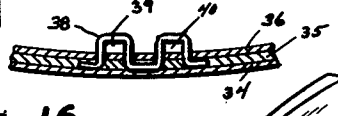


Fig. 16.

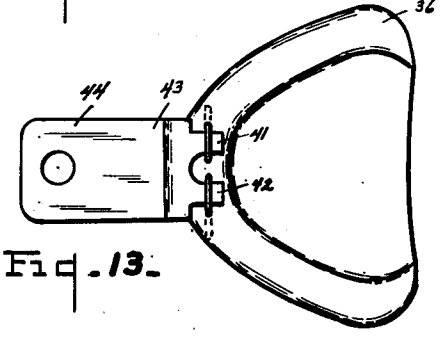


Fig. 13.

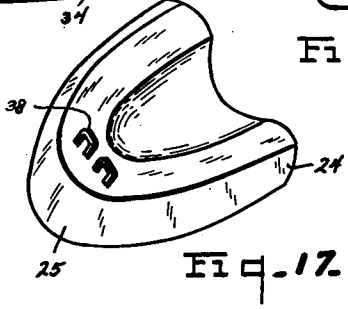


Fig. 17.

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DENTAL IMPRESSION TRAY

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Application April 19, 1951, Serial No. 221,926

10 Claims. (Cl. 32—17)

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This invention relates to dental apparatus and particularly to impression trays. In the making of full dentures, casts, impressions or prints or the upper jaw, the lower jaw, or for making of dental prosthetics, such as bridges and partial plates, it is essential that a good impression be made. In many instances, poor impressions result from the apparatus now available and used in the art.

This invention provides a type of tray construction which makes it possible to improve the quality of an impression while reducing the amount of discomfort to the patient. It is thus possible to make an impression with far less inconvenience to the patient so that a good impression may be obtained the first time. In addition, the resulting impression obtained by the use of this invention is less likely to have flaws than is true with impressions made by conventional means.

This invention further provides a non-metallic type of tray which will hold impression materials whose ingredients are conducive to proper combination to create more effective molds. The tray may employ a number of apertures, the size and spacing being varied to suit the requirements if using colloids. The tray may be free of apertures when using plaster of Paris and the like. With this tray it has been discovered that it is possible to control dimensional changes and increase flexibility which will prevent dimensional distortion.

A further embodiment of this invention consists in the provision of a tray made of fibrous material arranged in a plurality of plies adhering together in intimate union, an intermediate ply forming a reinforcing member for substantially the entire area thereof but being less extensive to provide soft edge portions to the tray, and said reinforcing ply extending outwardly at the front section in substantially a horizontal manner to form a stiff handle member for supporting the entire tray.

A preferred form of this invention consists of a laminated dental tray properly shaped to hold impression forming compound for oral prosthetic work, comprising a preformed inner layer of fibrous material, a preformed outer layer of fibrous material, and a substantially rigid preformed intermediate layer of fibrous material, said inner and outer layers being coextensive and extended further than the intermediate layer, all of said layers disposed in superposed relationship, the outer edge portions of the inner and outer layers being in contact and sealing the

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edge portion of the intermediate layer therein, all of said layers properly forming laminated central, ridge and flange portions, said peripheral edge portions of the tray having less stock therein than the remaining portions of the tray whereby to constitute a soft, moldable edge portion for forming a good seal when pressed against the roof and like portions of the mouth of a patient.

A further object of the invention consists substantially in providing a non-metallic dental spoon or tray made of fibrous material arranged in a plurality of plies adhering together in intimate union, with one ply, as for example the central ply between an inner and outer ply of a three ply tray, not coextensive but composed of fibrous material embodying stiffening material molded therein and reinforcing the same. Thus the tray comprises soft fibrous upwardly extending peripheral edge portions with a reinforced intermediate ply extending over the entire central portion of the tray and a short distance upwardly within said edge portions to reinforce the lower portions thereof, however it being of less height than that of the inner and outer plies it provides a stiff lower rim portion of the three plies at the base thereof and a soft upper edge portion of the two plies at the upper extremities thereof. The soft extremities are intended to reduce the irritation when the extremities of the tray is pressed against the roof and other portions of the mouth, and to assist in producing a good seal.

A still further object of this invention is to provide a fibrous dental tray which can be inserted in a less extensive metallic tray, the fibrous tray holding the impression material free from the metallic tray and providing soft fibrous edge portions for coming in contact with the patient's mouth.

A still further object of this invention is to provide both upper and lower type trays, singularly without an anterior handle, composed of fibrous material adapted to be nested together in storage, and for temporary employment, to be thrown away after once using and to be replaced by another new or fresh one the next time a tray is needed to hold impression material.

A still further object of this invention is to provide both upper and lower type dental trays composed of fibrous material adapted to be thrown away after once using, each tray embodying means for interconnecting said tray with a permanent handle portion in a detachable but otherwise strong and rigid manner.

A still further object of this invention is to provide a dental tray comprising two parts or sections, one of which is a metallic or otherwise rigid, durable, and permanent holder or support, while the other section, which is very thin and may be composed of preformed, strong and tough paper, or substantially non-rigid material comprising a plurality of plies, said tray adapted to be nested in the holder or permanent section, and is for temporary employment, to be thrown away after once using and to be replaced by another new or fresh one the next time the tray is to be used to make an impression.

It has heretofore been the practice in making impressions of the upper, or lower jaw and the like, to select one rigid tray from fifty or more dental trays which will fit the mouth of the patient and make a good seal against the roof of the mouth or other portions of the mouth. The tray must be thoroughly cleaned, filled with impression material and inserted into the mouth of the patient. If the tray employed in the art of dentistry is open at the back or lightly arched and does not make a good seal because its side portions are too high, the impression material displaced by the jaw will freely flow out at the back. If a cast of the upper jaw is taken while the patient occupies a recumbent position the excess material is liable to penetrate into the throat of the patient and to cause irritations. This practice requires the storage of a large number of rigid trays of all shapes and sizes, all of which must be kept clean and the procurement of same and upkeep of same is very expensive. Applicant provides a novel substantially rigid tray with soft terminal portions which will hold the impression material satisfactorily. Said tray can be held tightly by the dentist and molded into all the indentations and around the raised portions in a patient's mouth. Said tray being constructed of fibrous material, or other suitable moldable and pliable material, and produced for a small cost, can be employed by the dentist as a single use tray, the tray to be thrown away after once using and to be replaced by another new or fresh one for each impression.

Another object thereof is to provide a simple, efficient, and inexpensive dental impression tray.

Further objects of my invention will appear from the following description thereof, taken in connection with the attached drawings illustrating a preferred form of embodiment thereof, and in which:

Figure 1 is a transverse section of a fragment of a human head having upper and lower type dental trays embodying the present invention within the mouth thereof and illustrating the trays in section and filled with impression compound;

Figure 2 is a bottom plan view of an upper or maxillary type dental spoon embodying the present invention;

Figure 3 is a bottom plan view of a lower or mandibular type dental spoon embodying the present invention;

Figure 4 is a cross-sectional view of a maxillary type dental spoon filled with impression compound and embodying the present invention;

Figure 5 is a cross-sectional view similar to Figure 4 after an impression has been taken;

Figure 6 is a cross-sectional view of a maxillary type dental spoon embodying the present invention;

Figure 7 is a cross-sectional view of the parts

of a maxillary type dental spoon similar to that shown in Figure 6 and in disassembled relationship.

Figure 8 is a bottom plan view of a wire mesh rigid supporting member embodying an integral twisted wire handle, said member having substantially the same shape of the dental tray embodying the present invention;

Figure 9 is a bottom plan view of a maxillary type dental spoon embodying the present invention with an integral handle;

Figure 10 is a top plan view of the dental tray shown in Figure 9;

Figure 11 is a bottom plan view of a mandibular type dental spoon embodying the present invention with an integral handle;

Figure 12 is a top plan view of the dental tray shown in Figure 11;

Figure 13 is a bottom plan view of a maxillary type dental spoon embodying the present invention with a detachable metal handle.

Figure 14 is a side elevational view of the dental tray shown in Figure 13 with a fragmentary portion in section;

Figure 15 is a front elevational view of the dental tray shown in Figure 13;

Figure 16 is a fragmentary sectional view of the dental tray shown in Figure 13 and illustrating the detachable handle securing means;

Figure 17 is a bottom perspective view of the dental tray shown in Figure 13 with the handle removed.

Referring now to the drawings for a more particular description, 20 indicates a laminated upper or maxillary type dental tray provided with a shape which closely conforms to the roof 21 of the patient's mouth. The tray comprises ridge portion 22 having vault portion 23 and flange portion 24. It will be noted that flange portion 24 varies from a minimum height at the heel of the tray to a maximum at labial portion 25 as seen in Figures 14 and 17. The trays shown in Figures 1 thru 7 are void of any handle members and are usually supported by the dentist's fingers, or by a rigid member as for example the wire mesh supporting tray 26 embodying a wire handle 27 as shown in Figure 8.

A lower or mandibular type dental tray, or spoon 28 is indicated in Figures 1, 3, 11 and 12, said tray shaped to fit the surface of the lower jaw 29. It is understood that in Figures 1, 4 and 5 there is indicated at 30, 31 and 32 comparatively thick layers of impression compound which are shown thick solely for convenience of illustration.

The trays 20 and 28 in the practice of the present invention are provided with a plurality of apertures 33 through the ridge, vault and flange portions or other suitable portions thereof, the number and position of said apertures with respect to each other being optional and as may be required. When colloids are used as the impression compound, more apertures will be desired than when plaster of Paris and the like is used. Said impression compound should have the characteristic of being adapted to adhere to the tray to which it is applied after solidification and the further characteristic of not adhering permanently to the mouth of the patient.

The maxillary type dental tray shown in Figures 1, 2, 4, 5, 6, 7, 9, 10, 13, 14, 15, and 17 comprises a laminated paper tray, or a laminated tray of similar suitable material, for temporary use properly shaped to hold impression com-

pound, the laminations are clearly shown by Figures 6 and 7. The inner layer 34 is preferably preformed and shown as composed of paper, the intermediate layer 35 is preferably preformed and shown as comprising cardboard or like stiff kind of paper, the outer layer 36 is preferably preformed and shown as composed of paper. It has been found that the inner and outer layers may be composed of thin layers of compressed pulp material and the intermediate layer may be composed of a thick layer of compressed pulp. The flange portions 24 shown specifically in Figures 1, 4, 5, 6 and 7 are of major importance, the flanges of the inner and outer layers extend further than the flanges of the intermediate layer. When the three layers are pressed together the peripheral edge portions of the soft inner and outer layers come in contact forming an intimate union, since they are coextensive and extend further than the flange of the rigid intermediate layer. The outer edge portions of the tray provides a soft, moldable edge portion for forming a good seal when pressed against the roof or like portions of the mouth of a patient.

The mandibular type dental tray shown by Figures 1, 3, 11 and 12 is also constructed in the same manner and of like material as described above. It will be understood that the mandibular type dental tray will have the same soft, moldable edges and may be fitted to a lower jaw with equal facility and by substantially the same method and means as that herein described for the upper jaw.

The fibrous trays with a substantially rigid preformed intermediate layer will efficiently hold the impression compound and can be used by a dentist, with or without the metal tray 26 as shown by Figure 8. Said tray 26 embodies a very low flange portion so that only the soft edge portions of the fibrous tray will contact the roof or like portions of a patient's mouth.

When a fibrous, or like type, tray is desired which incorporates a handle portion, permanently attached thereto, the fibrous, rigid intermediate layer may be formed with an extended handle member 37 as clearly shown by Figures 9, 10, 11 and 12. The inner and outer layers of thin fibrous material will cover substantially the entire rigid intermediate layer with exception of the handle member 37. Should it be desired to cover the rigid handle member 37, the inner and outer layers may be formed with extending portions to cover the upper and lower surface of said handle member.

It may be desired to supply fibrous trays without handle portions, this type of tray will nest with greater ease and require less space than those having integral handle members. Figures 13, 14, 15, 16 and 17 show a tray with means attached to the rigid intermediate layer for interconnecting the tray with a metal, or permanent, handle in a detachable, strong and rigid manner. Said means is shown as a preformed metal wire member 38 secured to layer 35 and properly formed with two openings 39 and 40 to receive two stud portions 41 and 42 formed upon the free end 43 of handle 44. The wire member 38 is rigidly secured to the ridge portion of the tray adjacent the labial portion of the tray. It will be understood that the same type handle 44 and wire securing means 38 may be used and constructed with the mandibular type dental trays and can be used with equal facility.

It will be understood that the construction shown in the various figures of the drawing, and

above described, pertains to a novel invention which is equally useful in connection with the making of full dentures, casts, impressions or prints of the upper jaw, the lower jaw, or for making of dental prosthetics, such as bridges and partial plates. The types shown and described are preferably non-metallic dental trays which will hold impression materials to create effective molds. The soft extremities are intended to reduce the irritation when said extremities of the tray are pressed against the mouth portions of the patient. The sanitary feature is very important as the tray is made at a small cost and is for temporary employment, to be thrown away after once using and to be replaced by another new or fresh one the next time a tray is needed to hold impression material. It may be desirable to make the fibrous tray in various sizes, however it is estimated that a maximum of ten different sizes of upper and lower type trays which can be cut or trimmed to size will replace approximately seventy different sizes of metallic trays as now employed in the dental profession. The fibrous trays will be constructed so that they can be cut, or trimmed, at the peripheral edges and especially at the heel of the lower type trays, and especially the soft heel of the central portion of the tray which comes in contact with the palate, or roof portion, of the patient's mouth.

It may be desirable to employ fibrous trays without handles which can be supported by a metallic supporting spoon of similar size and shape, or it may be desirable to use fibrous trays with a permanent detachable handle member where the trays can be nested and retained in a sanitary place, or it may be desirable to employ a tray with an integral handle member formed with the rigid intermediate layer of the tray whereby the entire unit may be nested in a sanitary and desirable manner. Any or all of said type trays produce a novel invention and will produce a mold from which an absolutely form fitting denture may be obtained.

A substantial advantage accruing from the use of the present invention, will become manifest in connection with the manufacture of plaster of Paris casts from the impression. As is well known, an impression of compound in a tray is first formed and thereafter a plaster of Paris cast of this impression must be made. After the plaster of Paris has set, it is necessary to separate the plaster of Paris cast from the compound and tray. By virtue of the present invention, it is much simpler to remove the fibrous tray from the impression material, and/or the plaster of Paris cast, in place of removing the plaster of Paris cast from a rigid metal tray. Hence the sanitary fibrous tray shown and described is a great improvement over the prior art.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is:

1. A laminated dental tray properly shaped to hold impression forming compound for oral prosthetic work, comprising a thin preformed inner layer of fibrous material, a thin preformed outer layer of fibrous material, and a substantially rigid preformed intermediate layer of fibrous material thicker than said inner and outer layers, said inner and outer layers being coextensive and extended further than the intermediate layer, all of said layers disposed in superposed relationship, the peripheral edge portions

of the inner and outer layers meeting at a feather edge rim and spaced outwardly from the edge portion of said intermediate layer and forming an intimate union, said layers properly forming a tray with laminated central, ridge and flange portions, said construction providing a tray with peripheral feather edge portions having less stock therein than the remaining portions of the tray constituting a soft, moldable edge portion for forming a good seal when pressed against the roof and like portions of the mouth of a patient, and a removable handle for said tray provided with extending portions for slidably mounting with means secured to said tray.

2. A laminated dental tray properly shaped to hold impression forming compound for oral prosthetic work, comprising a thin preformed inner layer of fibrous material, a thin preformed outer layer of fibrous material, and a substantially rigid preformed intermediate layer of fibrous material thicker than said inner and outer layers, said inner and outer layers being coextensive and extended further than the intermediate layer, all of said layers disposed in superposed relationship, all of said layers embodying a plurality of apertures, the apertures in each layer arranged to coincide in vertical alignment with the apertures in the layer adjacent thereto, the peripheral edge portions of the inner and outer layers meeting at a feather edge rim and spaced outwardly from the edge portion of said intermediate layer and forming an intimate union, said layers properly forming a tray with a laminated thick central, thick ridge and thin flange portion, said construction providing a tray with peripheral edge portions having less stock therein than the remaining portions of the tray constituting a soft, moldable edge portion for forming a good seal when pressed against the roof and like portions of the mouth of a patient, and a removable handle for said tray provided with extending members for slidably mounting with means secured to said tray.

3. A laminated dental tray properly shaped to hold impression forming compound for oral prosthetic work, comprising a thin preformed inner layer of fibrous material, a thin preformed outer layer of fibrous material, and a substantially rigid thick preformed intermediate layer of fibrous material, said inner and outer layers being coextensive and extended further than the intermediate layer, all of said layers disposed in superposed relationship, a removable handle, means attached to the intermediate layer of fibrous material for interconnecting said tray with said removable handle in a detachable, strong and rigid manner, the peripheral edge portions of the inner and outer layers meeting at a feather edge rim and spaced outwardly from the edge portion of said intermediate layer and forming an intimate union, said layers properly forming a tray with laminated thick central, thick ridge and thin flange portions, said construction providing a tray with peripheral edge portions having less stock therein than the remaining portions of the tray constituting a soft, moldable edge portion for forming a good seal when pressed against the roof and like portions of the mouth of a patient.

4. A laminated dental tray properly shaped to hold impression forming compound for oral prosthetic work, comprising a preformed thin inner layer of fibrous material, a preformed thin outer layer of fibrous material, and a thick substantially rigid preformed intermediate layer of strong fibrous material, said inner and outer layers being coextensive and extended further than the intermediate layer, all of said layers disposed in superposed relationship, the peripheral edge portions of the inner and outer layers being in contact forming an intimate union, said layers properly forming a tray with laminated central, ridge and flange portions, said construction providing a tray with peripheral edge portions having less stock therein than the remaining portions of the tray constituting a soft, moldable edge portion for forming a good seal when pressed against the roof and like portions of the mouth of a patient, a removable handle, and said tray provided with means for securing said removable handle.

5. A form of this invention consists of a laminated dental tray properly shaped to hold impression forming compound for oral prosthetic work, comprising a preformed thin inner layer of paper, a preformed thin outer layer of paper and a substantially rigid preformed intermediate layer of opaque fiber board thicker than said inner and outer layers, said inner and outer layers being coextensive and extended further than the intermediate layer, all of said layers disposed in superposed relationship, the outer edge portions of the inner and outer layers meeting at a feather edge rim and spaced outwardly from the edge portion of said intermediate layer and sealing the edge portion of the intermediate layer therein, all of said layers properly forming laminated central, ridge and flange portions, said peripheral edge portions of the tray having less stock therein than the remaining portions of the tray whereby to constitute a soft, moldable edge portion for forming a good seal when pressed against the roof and like portions of the mouth of a patient, a removable handle, and said tray provided with means for receiving said removable handle.

6. A form of this invention consists of a laminated dental tray properly shaped to hold impression forming compound for oral prosthetic work, comprising a thin preformed inner layer of paper, a thin preformed outer layer of paper and a substantially thick rigid preformed intermediate layer of opaque cardboard, said thin inner and outer layers being coextensive and extended further than the intermediate layer meeting at a feather edge rim and spaced outwardly from the edge portion of said intermediate layer, all of said layers disposed in superposed relationship, the outer edge portions of the inner and outer layers being in contact and sealing the edge portion of the intermediate layer therein, all of said layers properly forming laminated thick central, thick ridge and thin flange portions, said peripheral edge portions of the tray having less stock therein than the remaining portions of the tray whereby to constitute a soft, moldable edge portion for forming a good seal when pressed against the roof and like portions of the mouth of a patient, and a removable handle for said tray and provided at one end thereof with extending portions for mounting with means secured to the thick portion of said tray.

7. A laminated dental tray properly shaped to hold impression forming compound for oral prosthetic work, comprising a preformed inner layer of thin paper material, a preformed outer layer of thin paper material, and a substantially rigid preformed intermediate layer of thick opaque cardboard, said inner and outer layers being coextensive and extended further than the intermediate layer meeting at a feather edge rim and spaced outwardly from the edge portion of said intermediate layer, all of said layers disposed in superposed relationship, the peripheral edge por-

tions of the inner and outer layers being in contact forming an intimate union, said layers properly forming a tray with a thick laminated central, a thick laminated ridge portion, and a thin laminated flange portion, said construction providing a tray with peripheral edge portions having less stock therein than the remaining portions of the tray constituting a soft, moldable edge portion for forming a good seal when pressed against the roof and like portions of the mouth of a patient, and a removable handle for said tray formed of thick opaque cardboard and provided at one end thereof with extending portions for mounting with means secured to the thick opaque cardboard portion of said tray.

8. A laminated dental tray for taking lower or mandibular impressions, comprising ridge and labial portions, said portions embodying a preformed inner layer of thin paper material, a preformed outer layer of thin paper material, and a substantially rigid preformed intermediate layer of cardboard thicker than said inner and outer layers, said labial portions extending outwardly at an angle to said ridge portion and having less stock in its peripheral edge portions than the remaining portions of the tray forming a feather edge rim whereby to constitute a ridge portion of stiffness and rigidity surrounded by an outer less rigid labial peripheral edge portion, and said tray provided with a removable handle and means for securing said removable handle.

9. In a dental spoon for taking impressions of the upper jaw, in combination, a preformed inner layer of thin paper, a preformed outer layer of thin paper, a preformed intermediate layer of cardboard thicker than said inner and outer layers, all of said layers disposed in superposed relation, said spoon rounded at the back, has divergent edges and a rimmed concave front, a rear portion concave in cross section in respect to its central portion, said inner layer and said outer layer being coextensive meeting at a feather edge rim and spaced outwardly from the edge portion of said intermediate layer, a removable handle extending forwardly from said tray, and means attached to said intermediate layer for interconnecting said tray with said removable handle in a quick detachable, strong and rigid manner.

10. A form of this invention consists of a laminated dental tray properly shaped to hold impression forming compound for oral prosthetic work, comprising a preformed thin inner layer of paper, a preformed thin outer layer of paper and a substantially rigid preformed intermediate layer of opaque fiber board thicker than said inner and outer layers, said inner and outer layers being coextensive and extended further than the intermediate layer, all of said layers disposed in superposed relationship, the outer edge portions of the inner and outer layers meeting at a feather edge rim and spaced outwardly from the edge portion of said intermediate layer and sealing the edge portion of the intermediate layer therein, all of said layers properly forming laminated central, ridge and flange portions, said peripheral edge portions of the tray having less stock therein than the remaining portions of the tray whereby to constitute a soft, moldable edge portion for forming a good seal when pressed against the roof and like portions of the mouth of the patient.

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