

Sept. 8, 1936.

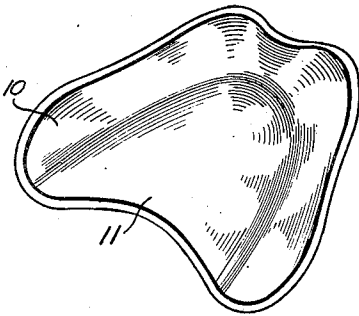
M. W. MANN

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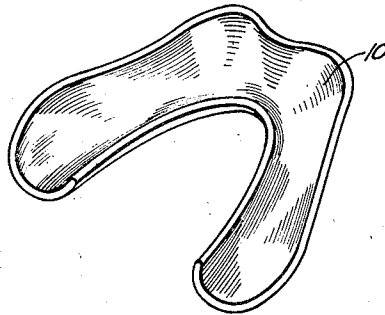
FLEXIBLE DENTAL TRAY

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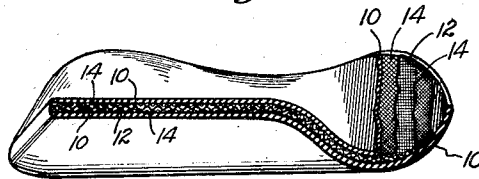
*Fig. 1.*



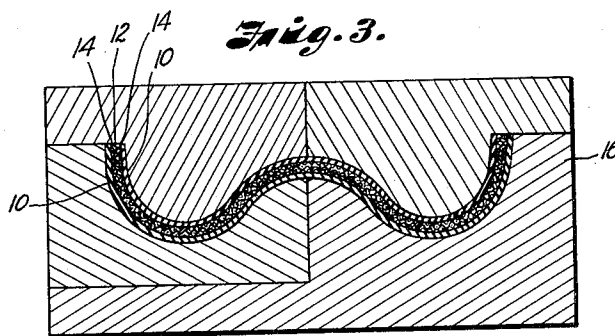
*Fig. 4.*



*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE

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## FLEXIBLE DENTAL TRAY

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3 Claims. (Cl. 32—17)

This invention relates to trays forming receptacles for the plaster composition or impression material used by dentists in obtaining impressions of the upper and lower gum ridges of the mouth, as required in the making of artificial dentures in dental prosthesis.

Accordingly, the primary object in view is to provide a tray or receptacle of this type which will be not only of a pliable character for enabling the same to be conveniently manipulated by the operator for properly conforming the plaster or impression material to the contour of the parts affected, but also of a form-retaining character for the purpose of causing the impression taken to retain its shape or contour after the tray has been removed from the mouth of the patient.

For accomplishing this result I have devised a tray construction in which the receptacle is of suitable soft composition with an appropriate element embedded therein having the required pliable and form-retaining properties for the purposes in view.

It is further sought to provide a construction which may be manufactured economically for enabling the article to be supplied at small cost to the profession, so that each of the devices can be discarded after it has been once used in the making of a single impression.

With the foregoing general object in view the invention will now be described by reference to the accompanying drawing illustrating a practical form of embodiment of my improved tray device, after which those features deemed to be novel and patentable will be particularly set forth and claimed.

In the drawing—

Figure 1 is a perspective view illustrating a flexible dental tray embodying the present invention;

Figure 2 is a longitudinal sectional view of the same;

Figure 3 is a transverse sectional view of the tray device in process of construction; and

Figure 4 is a perspective view of the tray as adapted for use with the lower gum ridge of the mouth.

Referring now to the said drawing in detail, the improved device is shown as comprising a tray or receptacle member having an outer composition of soft rubber or equivalent soft yielding material, 10, within which is embedded a layer 12 of appropriate pliable material, such as thin sheeting or a fine mesh screen material of copper or like substance having equivalent pliable

and reasonably effective form-retaining properties for the purpose in view. I have found a relatively fine mesh copper screening to answer the requirements in this regard, and in incorporating it into the construction of the tray it is desirable to enclose the metallic layer 12 between two plies of fabric 14 of a relatively fine weave, whereby the screen or metallic layer 12 is more securely embedded and anchored and any possible slipping tendency overcome.

One practical method of assembling the structure is illustrated in Figure 3, showing suitable dies 16 for molding the tray assembly into approximately correct form for use. Blanks for the outer rubber composition are cut from rubber sheeting, two such blanks being preferably assembled for the bottom of the tray and a single blank for the top or inside of the tray, with the screen blank 12 cut from suitable screen sheet material and enclosed between the fabric layers 14 and then inserted between the rubber blanks 10. After being subjected to the die action, under suitable pressure and for vulcanizing the layers together in this relation, the tray is removed and its outer edges appropriately trimmed, leaving the edges of the inner layers 12 and 14, however, completely enclosed by the rubber composition at the outer margin all round the tray.

For the lower mouth tray, as shown in Figure 4, the construction is in all respects essentially the same, with the exception that the inner palate portion 11 of the upper tray is of course omitted.

The trays are made up in a range of sizes varying to an extent sufficient for the different plate work operations ordinarily required in the general course of the dentist's work.

In any dental operation designed for the preparation of plate work it is of course primarily essential that as perfect an impression as possible be obtained of the gum ridge in order to insure the proper fit of the denture when this is prepared from the impression. The purpose of the impression tray of course is to serve as a means for holding the impression material or composition and enabling it to be properly and accurately distributed about the surfaces of the gum ridge for registering all the contours and irregularities of those surfaces. While a more or less rigid tray serves satisfactorily as a supporting means for the impression material, and also as a means of forcing said material in a bodily fashion against the gum surfaces, it admits of no selective pressures being applied by the operator at such points as he may wish to conform the plastic material individually by

forcing into the various recesses or pockets of the gum ridge for obtaining a more nearly accurate registration of these gum irregularities. Such inadequacies of the relatively rigid type of tray result in correspondingly imperfect molds or impressions of the mouth, the same being only approximations and necessitating repeated operations of taking these impressions for the purpose of securing as close an approximation as possible in the individual case.

The improved device herein described overcomes these disadvantages or defects which are inherent in the prevailing types of relatively rigid or stiff trays and which impose such a handicap upon the dental operations required for plate work.

The yielding and pliable characteristics of the interior metallic layer of the present improved construction permits the operator to apply whatever pressure is necessary at any point and thereby, through the yielding action of the tray material, accurately conform the plastic composition or impression material to all the irregularities in the contour of the gum surfaces. Moreover, while thus yielding in response to pressures exerted by the operator in molding the impression material to the gum surfaces, the character of the tray with its pliable and yet form-retaining properties is such as to retain its shape after being manipulated in the manner described,—its opposition to any change in shape being sufficient to overcome whatever resiliency is left in the softer outer portions of the tray. As a consequence the impression material is likewise forced to retain therein a true and accurate register of the impressions produced in said material as a result of the molding operation, since the fact that the tray itself keeps its shape after the molding action allows no displacement of the impression material as the tray and its contents are removed from the mouth. An accurate and faithful reproduction of the gum contours is thus obtained for the succeeding steps involved in the preparation of the denture, and no repetition of the impression step will be found necessary as is so often required with prevailing types of trays.

I am aware that certain designs of flexible trays have been used for impression work, but these previous types have either been of a more or less resilient character, or of absolutely limp material, and therefore possessed of no shape-retaining properties whatsoever and therefore entirely lacking in one of the important requirements of the improved construction.

So far as I am aware, it is new in this art to provide a tray device possessing the combined properties of responding to pressures of the op-

erator to conform the impression material within the tray to the contours of the gum ridge, and of thereafter retaining its shape for correspondingly holding and supporting the impression material in such a way as to preserve the contours into which it has been conformed.

While I have illustrated and described what I have found to represent a satisfactory and practical form of embodiment of my invention, I desire to be understood as expressly reserving the right to make whatever changes or modifications may be deemed to fairly fall within the spirit and scope of the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters-Patent is:—

1. A flexible dental tray for impression work comprising, a receptacle in tray form having an outer protective coating of material having soft and slightly resilient properties, an inner completely enclosed layer of pliable material responsive to pressures of the operator in molding the impression material and sufficiently resistant to overcome any resiliency in the coating material for preserving the conformed condition of the impression material, and means interposed between one side of said inner layer and said outer protective coating for preventing casual slipping of said inner layer and outer coating relative to each other.

2. A flexible dental tray for impression work comprising, a receptacle in tray form having an outer protective coating of soft yielding material, and an inner sheet of screen mesh pliable material encased between thin fabric layers effective for securing the screen mesh material against any relative slipping tendency within said outer coating, said pliable material being responsive to pressures of the operator in molding the impression material while retaining its shape after such pressure manipulations to preserve the conformed condition of the impression material.

3. A flexible dental tray for impression work comprising, a receptacle in tray form having an outer protective coating of soft yielding material, an inner sheet of screen mesh pliable material responsive to pressures of the operator in molding the impression material while retaining its shape after such pressure manipulations to preserve the conformed condition of the impression material, and a layer of thin fabric material interposed between one side of said screen mesh material and the outer protective coating for securing said screen mesh material against casual slipping tendency relative to the protective coating.

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