July 19, 1955 R. J. JONES 2,713,202

BITE TRAY

Filed June 2, 1953 2 Sheets-Sheet 1

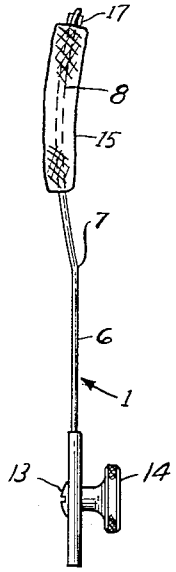


Fig. 2.

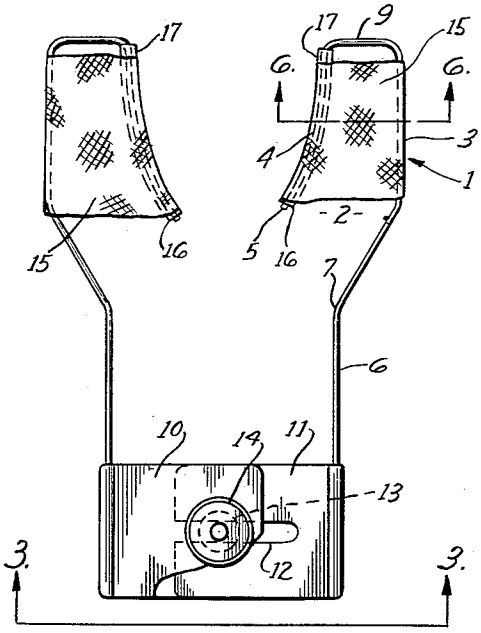


Fig. 1.

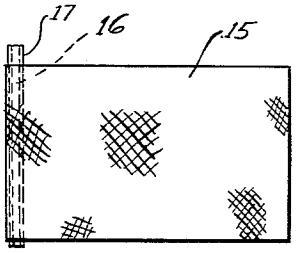


Fig. 4.

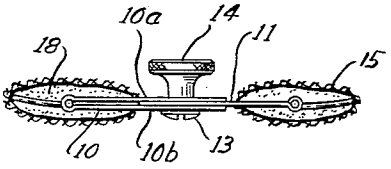


Fig. 3.



Fig. 5.

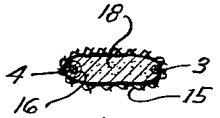


Fig. 6.

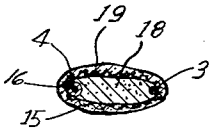


Fig. 7.

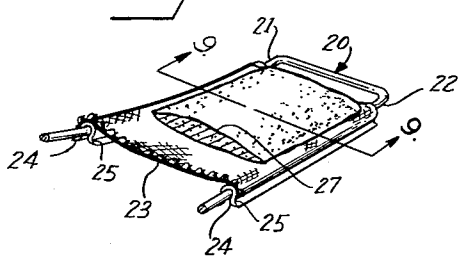
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BITE TRAY

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Fig. 8



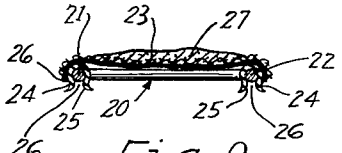


Fig. 9

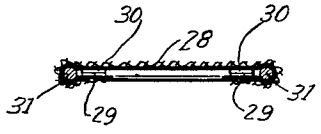


Fig. 11.

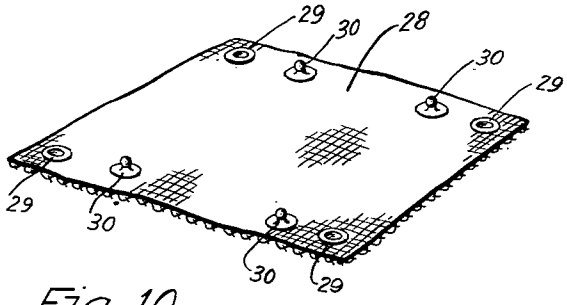


Fig. 10.

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2,713,202

BITE TRAY

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Application June 2, 1953, Serial No. 359,103

9 Claims. (Cl. 32—19)

This invention relates to a dental instrument and particularly to a new improved bite tray for taking impressions of the bite of a patient.

Heretofore in taking the bite of patients, the customary practice has been to insert a wad or sheet of relatively soft wax between the upper and lower teeth and, while holding the wax in such position, having the patient bite on the wax until his teeth have reached their normal occlusion.

However, it is known that the human teeth are temporarily shifted in position slightly by the application thereto of relatively light pressures. Consequently unless the wax is exceedingly soft so that it does not offer any appreciable resistance to occlusion of the teeth, the teeth are moved slightly out of their normal positions so that the impression does not reflect the true occlusion.

Furthermore, as soon as this appreciable resistance to occlusion is detected by the patient, his reflexes tend to control the movement of his jaws so that they do not close in the same manner as they would were no resistance present.

On the other hand, it is very difficult to provide waxes or other impression media which are so soft that they do not offer appreciable or detectable resistance or cause slight movement of the teeth and which, at the same time, are of proper consistency so that they can be handled properly in accordance with the customary procedures. If the impression medium is a thermoplastic material such as wax, it must be chilled, usually by the application of cold water, while held between the closed teeth. During this operation, if the pressure of the bite is relieved, the teeth tend to return to their normal position.

As a result of these conditions, inaccuracies and warpage of the impression material are introduced and are reflected in final bite impression.

Heretofore, it has been almost impossible to obtain a plurality of identical bite impressions of a patient's mouth.

This problem of obtaining true impressions has long existed and until the present solution afforded by the present invention was made, rarely if ever, was a true impression obtained. In the absence of the true impression, considerable grinding and other mechanical manipulations by the dentist are required.

The present invention resides in a bite tray and bib combination by which bite impression material can be supported in proper position for taking an impression of a bite while the material is in such relatively soft and plastic condition that it does not impose any detectable resistance to the natural occlusion of the teeth and hence does not cause any temporary displacement or misalignment of the teeth during the taking of the bite impression.

The device of the present invention comprises essentially a three-sided frame including a pair of side frame members spaced apart laterally from each other and a bib of readily flexible open-mesh fabric or like material detachably secured to the frame and bridging across the space between the members and exceedingly soft and readily flowable impression material having little or no detectable resistance to occlusion carried on and supported by the bib.

Various objects and advantages of the invention will become apparent from the following description in which reference is made to the drawings illustrating a preferred embodiment of the invention and in which:

Figure 1 is a top plan view of a bite tray and bib combination embodying the principles of the present invention, the tray and bib being shown with the impression material carried thereby in condition for use;

Figure 2 is a left side elevation of the combination illustrated in Figure 1;

Figure 3 is a front elevation of the combination illustrated in Figure 1, viewed as indicated by the line 3—3 of Figure 1;

Figure 4 is a top plan view of a bib of the present tray;

Figure 5 is a front elevation of the bib illustrated in Figure 4;

Figure 6 is a cross-sectional view of the combination with the bite impression material in place and is taken on line 6—6 of Figure 1;

Figure 7 is a view similar to Figure 6 showing another disposition of the impression material on the tray;

Figure 8 is a perspective view of a modified form of bib and frame combination, part only of the frame being illustrated;

Figure 9 is a cross sectional view of the bib and frame of Figure 8, taken on line 9—9 thereof, and with impression paste added in position for use;

Figure 10 is a perspective view of another modification of the bib; and

Figure 11 is a cross-sectional view of a frame with the bib of Figure 10 installed thereon.

Referring to the drawings, the bite tray comprises essentially a frame indicated generally at 1, which is open at one end, as indicated at 2 so as not to interfere with a patient's bite. The frame may comprise a pair of side frame members 3 and 4 which are spaced apart laterally from each other. The frame member 4 has one end free as indicated at 5. The frame is supported by a suitable handle 6. The handle is bent as indicated at 7 and the arms 3 and 4 are curved as indicated at 8 so that the frame can fit properly in the mouth of the patient.

In the preferred form, the frame and its handle comprise a single length of wire of the composition customarily used in orthodontics. This length of wire has a relatively long portion which provides the handle 6 and which, at one end, is connected to the frame member 3. The opposite end of the frame member 3 is connected to an intermediate connecting portion or end frame member 9 which in turn, is connected to one end of the frame member 4, the opposite end 5 of the frame member 4 being free and spaced from the handle and frame member 3 whereby the frame is open at the end adjacent the handle so as not to interfere with the bite. The portions of the wire forming the frame may be curved and merge into each other to provide a more rounded frame, if desired, but the elongated somewhat rectangular shape is preferred.

Ordinarily in taking an impression of a bite, the bite of both sides of the mouth are taken concurrently and for this purpose, right hand and left hand frame and handle combinations are provided, these being identical in all respects except that they are asymmetrical.

When such right hand and left hand frame members are used together for taking a bite of both sides of the mouth concurrently, the handles of the two members are secured in fixed adjusted relation with respect to each other. A convenient connection for connecting two such handles comprises a metal tab 10 on the left hand handle

and a cooperating tab **11** on the right hand handle, the tab **11** being a single thickness of metal and the tab **10** comprising an upper portion **10***a* and a lower portion **10***b*, these being spaced apart flatwise to accommodate the tab **11** therebetween. The tab **11** is provided with a slot **12**. A bolt **13** extends through the tab **10** and is accommodated in the slot **12**, and a suitable nut **14** is provided on the bolt **13** for clamping the portions **10***a* and **10***b* firmly against the tab **11**. Thus, the two trays can be secured in adjusted position relative to each other. This connection affords a certain amount of relative swinging movement of the trays about the axis of the bolt **13** as well as relative transverse lineal movement of the trays into adjusted positions relative to each other.

In order to support the impression material by the frames, a bib **15** is provided for each frame.

Each bib comprises a piece of thin, soft, flexible open-mesh material which may be molded or woven to provide a "fabric," for example, a material approximating very light weight gauze, or mosquito netting. The material preferably is exceedingly light, woven net having a relatively large mesh in relation to the cross-section of its strands and preferably is so thin that it does not interfere in any manner with the movement of the wax or impression medium during the taking of a bite impression. It offers no resistance to occlusion of the teeth as the patient closes his jaws.

The bib **15** illustrated in Figures 4 and 5 is supported by the frame in position to support the impression material by being connected to the side frame members and spanning the space therebetween. It is arranged to extend from one side frame member across the space therebetween around the opposite member and back toward the first side frame member. The bib **15** is of such length that a substantial margin is provided for extending back toward the original member after the bib has been folded about the opposite frame member. In general, it is sufficiently long so that its free edge extends substantially back to its connected edge.

The bib **15** is preferably made so that it can be attached to, and detached from, the frame readily. For this purpose, it is provided at one end with a connecting means which can receive the side member **4** free end foremost. The connecting means is preferably tubular and bendable transversely so as to adapt itself to and fit the curvilinear shape of the frame member **4**. In the form illustrated, the connecting means is a separate tube **16**, the tube preferably being composed of extruded synthetic resin or other thermosetting or thermoplastic moldable material. One margin of the fabric may be bonded thereto by a suitable cement or otherwise. The tube **16** terminates at one end about flush with the adjacent edge of the fabric or bib and the other end has an extension portion **17** which extends about ¼" beyond the corresponding edge of the bib. This extension provides a positioning means for assuring proper installation of the bib on the frame.

In using the device, the two trays are adjusted by the means of the tabs **10** and **11** and the adjusting bolt and nut **13** and **14** so that they fit in the proper position in the mouth for taking the impression of a bite of both sides of the mouth concurrently. When secured in this position, they are removed from the mouth and each frame is provided with a bib. To install the bib, the tubular member **16** is slid onto the frame member **4** from the free end, with the extension portion **17** foremost in the direction of movement, until the end of extension **17** strikes the frame member **9** and arrests further movement. This assures spacing of the bib from the rear frame member **9** so that an open space is provided between the rear end of the bib and the frame for affording proper vision by the operator so that he can determine when the tray is in the proper position for a bite impression. With the bib **15** so installed, it is then held across the space between the members **3** and **4** and the impression material **18** in exceedingly soft condition is applied. The free end of the bib is then folded over the frame member **3** and over the top of the paste or other material on the bib. In this condition the frame is ready for insertion in the mouth for taking the impression of the bite.

As illustrated in Figures 1 through 6, the impression material may be any one of the waxes, plaster of Paris, quick setting plastics, or other special impression pastes and media available on the market.

If desired, additional impression material **19** may be placed on the outside of the folded bib, as illustrated in Figure 7.

With the material thus held by the bib and frame, the impression of the bite is taken, the tray being held in the mouth in proper position until the paste or wax has set.

There are a number of impression media on the market which have been utilized for taking dental impressions and there is one now available which is so soft in its unset condition as to offer no noticeable resistance to occlusion of the teeth. However, this material has not heretofore been used for bite impressions inasmuch as it is too soft to be handled by the usual procedures used in taking bite impressions and apparently no one had conceived of the possibility of supporting it by an extraneous means in a manner which would not interfere with the taking of a bite impression. Its use heretofore has been confined to impressions taken with the usual impression plates or cups to support the material. This material is one having the consistency of unmelted butter yet it sets firmly in about 40 seconds. In the condition in which applied, it will offer no noticeable or appreciable resistance to free occlusion of teeth. It has been found, however, that this material can readily be supported on a bib of the character described and that the bib material does not in any way interfere with the formation of a proper impression by the impression material.

The present bib can readily be removed from the frame by slitting the portion folded about the member **3** and then sliding the tube **16** off of the frame member **4**. Since the impression media initially is quite sticky or tacky to handle, it is often desirable to have a bib which can be installed on the frame more readily than the bib illustrated in Figures 4 and 5. Such a bib and the manner in which it is installed on the frame is illustrated in Figures 8 and 9 wherein the frame indicated generally at **20** and having side members **21** and **22** is provided, the frame being in all respects the same as frame **1** heretofore described. The bib comprises a length of fabric **23** of the type heretofore described. At its edges the bib is connected to attaching means such as indicated at **24**, the attaching means being adapted to be snap-fastened on the members **21** and **22**, respectively, by movement theretowards radially of the members. The attaching means **24** are generally channel shaped in cross section with the free margins of the channel, indicated at **25**, flared outwardly from each other so as to form a guide leading into the base of the channel. The walls of the channel are formed so as to provide a restricted throat **26** of somewhat less width than the diameter of the frame members **21** and **22**. The attaching means **24** are made of resilient material so that the members **21** and **22** can be forced past the throats **26** of their respective attaching means by springing the sides of the channel apart, the sides of the channel returning and holding the channel in snap-fastened relation on the members **21** and **22**. The attaching means **24** may be of metal or moldable plastic material or the like. They grip the frame members **21** and **22** sufficiently tightly to support the bridging portion of the bib and the impression material **27** carried thereby.

Referring next to Figures 10 and 11, there is illustrated a bib **28** which may be of the material heretofore described. The attaching means comprising the usual glove type of snap fastener, comprising the usual button

having a cavity with an expansible entrance and a cooperating member having a ball adapted to be received through the end of the cavity by expansion of the entrance and retained therein by contraction of the entrance. In the form illustrated in Figures 10 and 11, the button such as indicated at **29** and the cooperating ball member indicated at **30** are provided in sets, one set adjacent each corner of the bib. For installation, the edge of the bib is folded around its associated frame member such as indicated at **31** in Figure 11 and while so folded, each button is snapped into engagement with its associated ball member.

In all forms of the invention, the impression media being so exceedingly soft and flowable, is supported by the tray so that the bite impressions can be obtained which are extremely accurate and precise. It appears that by the use of the present invention, a plurality of bite impressions may be taken of patient's teeth and the same will have no detectable differences.

Having thus described my invention, I claim:

1. In a bite tray device including a pair of side frame members spaced apart from each other, a piece of thin, flexible, soft, open-mesh material, snap fastening attaching means at opposite margins of the material and operative for detachably connecting said material at the margins to the frame members, respectively, so as to support the material in outspread condition between the frame members.

2. In a bite tray, a frame having an open end and a pair of transversely spaced side frame members, a bib of light weight, readily flexible mesh material, attaching means on the bib detachably connecting the bib along one edge to one side frame member, said bib having a portion which extends transversely of the frame and bridges across the space between said side frame members and having a free margin lapped around the other side frame member, a handle connected to one of said side frame members and extending from that end of its associated side frame member which is at the open end of the frame in a direction away from the opposite end of the frame.

3. A bite tray according to claim 2 characterized in that one frame member has a free end, and said attaching means is a tubular element and detachably telescopically receives, free end foremost, the frame member having the free end.

4. A bite tray according to claim 2 characterized in that the attaching means at said one margin of the bib extends a predetermined distance beyond the end of the bib and provides a spacing means for spacing the bib from the closed end of the frame.

5. A bib for the purposes described comprising a piece of thin flexible soft open mesh very light weight gauze, a

transversely flexible tube extending along one margin of the material substantially for the full length thereof and being connected to said material along said margin, said gauze consisting of organic material.

6. A bib for the purposes described comprising a piece of thin flexible soft open mesh material, a channel shape member connected to the material along one margin and opening away from the surface of the material, and said channel shape member having resilient self restoring side walls adapted for clamping engagement with a supporting member inserted therebetween.

7. A bite tray comprising a pair of open end frames, handles on the frames, respectively, each handle being connected at one of its ends to its associated frame and extending endwise from the open end of its associated frame in a direction away from the other end of its associated frame, separable connecting means on the other ends of the handles, respectively, detachably connecting the handles together so that the handles support the frames in laterally spaced relation to each other edgewise of the frames and for bodily movement edgewise of the frames and swinging movement about a common axis generally normal to the plane of the frames, each of said frames consisting of a single length of wire, one end portion of which provides an inner side frame member having a free end, an intermediate portion of which extends from the other end of, and at an abrupt angle to, the inner side frame member and provides an end frame member, and a third portion of which extends from the other end of, and at an abrupt angle to, the end frame member and provides an outer side frame member, and the handle of each frame member extending from that end of its associated outer side frame member opposite from the end frame member and in a direction generally endwise of the frame away from said end frame member.

8. A bite tray according to claim 7 characterized in that each frame consists of part only of the associated length of wire and the handle thereof comprises the remainder of said associated wire.

9. A bite tray according to claim 8 characterized in that bibs are mounted on the frames, respectively, and each bib comprises light weight, readily flexible mesh material connected to the side frame members of the associated frame and bridging the space therebetween and adapted to hold a mass of impression material.

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