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3,106,779

DENTURE MEASUREMENT DEVICE

Filed April 9, 1959

2 Sheets-Sheet 1

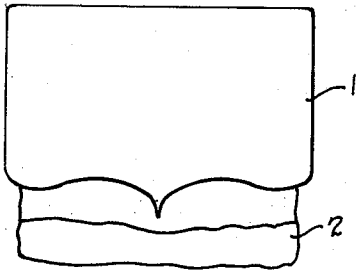


FIG. 1

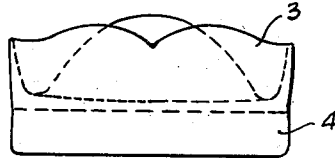


FIG. 2

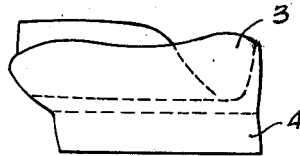


FIG. 3

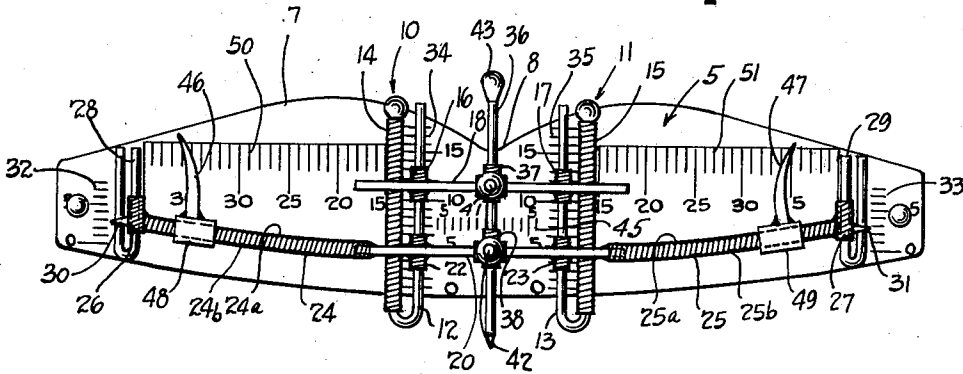


FIG. 4

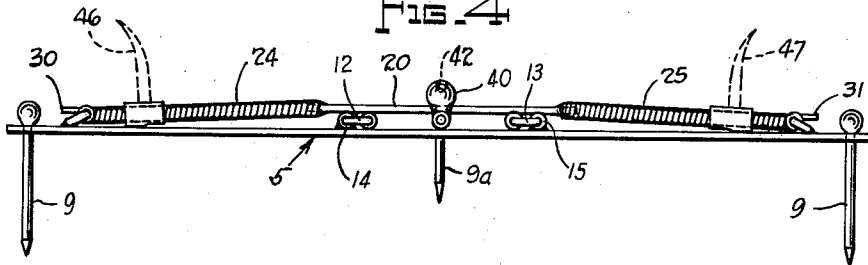


FIG. 5

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2 Sheets-Sheet 2

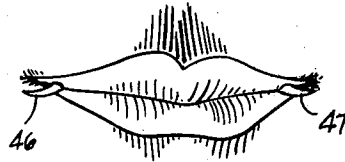
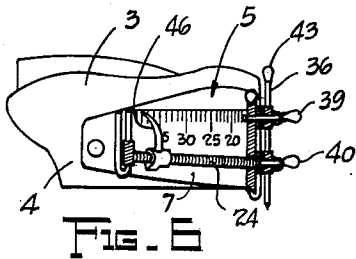


FIG. 7

60

	LEFT	RIGHT	CENTER
SIX ANTERIORS	36	37	
HIGH LIP LINE			11
INCISAL EDGE	3	3	5
FRENUM	0		

FIG. 8

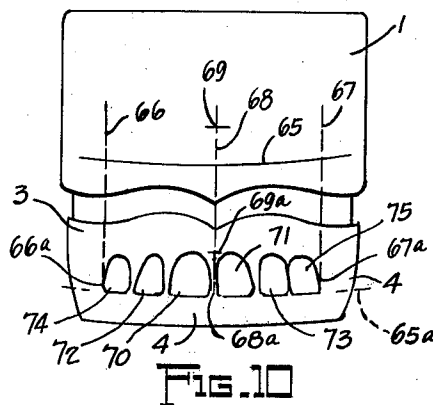
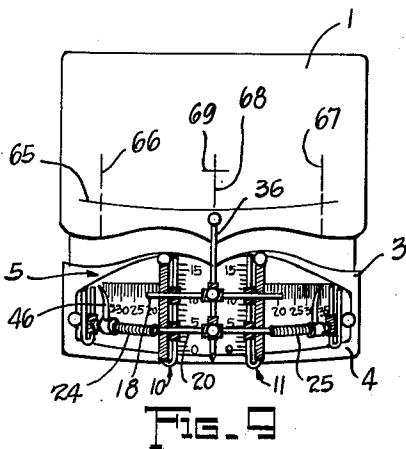


FIG. 10

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DENTURE MEASUREMENT DEVICE

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7 Claims. (Cl. 33—174)

This invention relates to the art of dentistry, and primarily to a measuring device for use therein to provide more accurate manufacture and fitting of dentures.

In the dental art, the process of making and fitting dentures has heretofore been one very largely dependent entirely upon the skill of the dentist and the laboratory upon whom he usually relies, and as such is subject to the possibility of error, both in judgment and by accident as a result of such dependence.

As can be readily appreciated, some kind of measuring means to determine with greater accuracy the positioning of teeth on a dental plate, so as to more nearly represent the natural appearance of the mouth of the patient, will be most desirably acceptable and this invention is designed to achieve that end.

In the designing and manufacture of dentures, the dentist commonly somewhat arbitrarily decides the position of the teeth on the denture and in this respect the teeth designated as the six anteriors, reference being made to the upper plate for example, require the greatest care for proper fitting and appearance, since these teeth are the most noticeable when in position in the wearer's mouth.

Since the position of the six anterior teeth and the location of the same with respect to both lateral and vertical positions is the most important, a device or means which will establish such location is obviously an improvement in the art which has heretofore relied upon guess work to a large extent.

With the foregoing general situation well understood by those skilled in the art, specifically the concept of this invention resides in the provision of a measuring device which may be used in conjunction with certain of the preliminary steps in the manufacture of dentures or dental plates so as to determine the location of the teeth thereon, the relationship of said teeth to the other portions of the mouth and in the final analysis result in comfort for the wearer as respects both fit and the appearance provided thereby.

It is therefore a principal object of this invention to provide a denture measuring device which is used throughout the various steps of preparing dentures, without the necessity for modifying any of the steps materially, particularly as relates to the fit of the dentures, yet affording greatly improved location of the teeth so as to similarly improve the final appearance thereof.

Another object of this invention is to provide a novel denture measuring device, which includes means for indicating the position of the lip, and primarily the upper lip which is the most important in denture fitting, likewise the location of the incisal edges of the teeth and the total width of the anterior teeth, known as the six anteriors.

Yet another object of this invention is to provide a novel measuring device, which includes instrumentalities arranged upon a body which is transferable and reusable as the case may be for various different denture preparation procedures, certain of the elements lending themselves to duplication and of such simplicity that the cost will be relatively small.

Still another object of this invention is to provide a denture measuring device, which enables the establishment of the positions to be assumed by the teeth which are most important from the aspect of appearance, provides a record of such positioning and prevents the possibility of changes inadvertently occurring during the fitting process and prior to the final manufacture of the dental plates.

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Another object of this invention is to provide a denture measuring device which may be made in different sizes to properly provide for fitting dentures in different persons, having in mind the fact that mouth characteristics of such persons are widely varying, and yet the different size devices are substantially identical as to the operating parts thereof and facilitate the manufacture and use of the device for the purposes hereinbefore set forth.

Another object of the invention is to provide a measuring device of the class described, which is of such simplicity and yet provides sufficient data with respect to the location of teeth as will make the same readily acceptable by those not so highly skilled in the art of dentistry and at the same time provide a final result for the person for whom the teeth are designed which will make for comfort and appearance which is substantially more life-like than has heretofore been possible.

Other and further objects of the invention will be understood from a consideration of the specification appended hereto and shown in the drawings wherein:

FIGURE 1 is a view showing a part of an articulator, with the gum impression thereon, this being denoted a model.

FIGURE 2 is a front view of a bite block.

FIGURE 3 is a side view of a bite block.

FIGURE 4 is an enlarged flattened view of the device of this invention.

FIGURE 5 is a bottom plan view.

FIGURE 6 is a side view of the bite block with measuring device hereof applied thereto.

FIGURE 7 is an illustrative view of a mouth section of a patient with certain of the indicators evident therein.

FIGURE 8 is a view showing a form of record card or sheet.

FIGURE 9 is a front view of a model showing the bite block applied thereto and with certain of the indicia positions transferred thereto.

FIGURE 10 is a front view of the model with the bite block attached and showing the six anterior teeth supported thereon.

Referring to the drawings, the various figures disclosed are those which are primarily directly important in explaining the invention, and in this regard the steps which are availed of by the dentist in carrying out the making and fitting of dentures are substantially as heretofore resorted to, with the use of the novel measurement device hereof, facilitating making of dentures. The dentist initially causes a wax impression to be made of the gums of the patient, in this instance the upper gums being used as illustrative, whereafter such impression is sent to a laboratory if the dentist so desires, which laboratory produces therefrom a model as shown in FIGURE 1 generally designated 1, which is made of suitable plaster material and mounted on an articulator, said articulator not being shown but being well known in the art.

The portion of the gums which is to be duplicated from the wax impression is a part of the model as indicated at 2.

The laboratory usually makes the bite block which is indicated in FIGURES 2 and 3 by itself, as comprising a plastic hard plate-like member 3 which conforms to the gum portions 2 of the model 1 having been made thereover, and having affixed along its lower periphery generally in the region which teeth will subsequently occupy, the wax substance 4. This is usually supplied by the laboratory and forwarded to the dentist for his subsequent manipulation and provision of the dentures thereby. The FIGURE 3 disclosure is a side view of the bite block showing the gum receiving section 3 at the upper portion and the wax section 4 at the lower portion, the said wax section 4 being secured to the hard plastic base member of the bite block.

With the bite block as shown in FIGURES 2 and 3, the same is forwarded to the dentist and he thereafter affixes the measurement device of this invention along the lines indicated in FIGURES 6 and 9, said device being denoted 5 generally and being disclosed in greatly enlarged condition in FIGURES 4 and 5 for purposes of the description now to follow.

Having in mind the device 5 as disclosed in its mounted condition in FIGURES 6 and 9 and in detail in FIGURES 4 and 5, it will be seen that the said device includes a body 7, which is of flexible material and having an upper curved section which is centrally cut out at 8 so as to conform to the general arrangement of or contour of a patient's mouth as indicated along the lines in FIGURE 9. The said body 7 is affixed to the bite block 3 and particularly the wax portion 4 thereof by means of the pins 9, which may be entered in suitable openings provided in the body 7. A fixed pin such as 9a, which pierces the wax portion 4 assists in positioning the device thereon.

This body member 7 is of thin flexible material and thus will conform readily to the shape provided by the bite block and in fact the said device may be made in several sizes so as to accommodate the conditions of the mouths of people which are widely varying in size.

Affixed to the face of the body 7 about centrally thereof, are the central guide means 10 and 11, which guide means include the vertically upstanding members 12 and 13 respectively, which members are arranged parallel to and closely spaced with regard to positioning instrumentalities 14 and 15 respectively which instrumentalities are intended to cooperate with certain indicators now to be described in detail. The parts 14 and 15 are formed by positioning a spring on extensions of the members 12 and 13, and fastening said springs to said members.

The indicators previously mentioned, include the slide parts 16 and 17 respectively, which are affixed to a horizontally extending member 18, the member 18 being arranged so that the positioning instrumentalities which are of the nature of corrugated parts engage the ends and by means of such engagement position the members 16 and 17 and thus the indicator 18 thereby, the indicator 18 being sometimes referred to as a first indicator or an upper or high lip line indicator.

Arranged below the first indicator 18 mentioned, is a further indicator 20, which is affixed at its ends to slide members 22 and 23, the member 20 engaging the positioning instrumentalities in a manner similar to that of the member 18. The ends of the members 18 and 20 are located so as to come in contact with the springs of the parts 14 and 15 as shown in FIGURE 5. In this instance the extremities of the member 20 are connected to a spring 24 at the left as viewed in FIGURE 4 and a further spring 25 on the right. This connection is integral, the flexible portions 24 and 25 being thus a part of the second indicator which is sometimes called the lower or incisal edge indicator.

The outer ends of the members 24 and 25 are connected to slide members 26 and 27 which are mounted on suitable guide means 28 and 29, so as to slide upwardly and downwardly thereon, the slide members 26 and 27 being equipped with pointers such as 30 and 31 respectively.

Suitable indicia are provided for the pointers 30 and 31 indicated at 32 and 33 respectively, and other indicia are provided for the upper and lower first and second indicators as to the portions 18 and 20 thereof, as indicated at 34 and 35 respectively, such indicia laid out in millimeters in accordance with accepted dental practice and thus readily recognized by the technician using the same. Suitable numbers are used in conjunction with the indicia for ready reference and in a manner to be subsequently considered.

A central or third or frenum muscle indicator 36 is shown as extending vertically and comprising a rod which

is transversely movable with an upper transversely positionable slide member 37 and a lower transversely positionable slide member 38, said members 37 and 38 being movable on the first and second indicator parts 18 and 20. The slide members 37 and 38 are equipped with suitable knobs 39 and 40 respectively, reference being had to FIGURE 6 for a side view thereof. The knobs 39 and 40 are provided with socket-like openings 41 and 42 for purposes which will be subsequently explained, the upper end of the rod 36 being equipped with a knob such as 43.

Suitable indicia are scribed on each side of the body 7 based on central point of reference, such indicia being denoted 45 and having reference to the third or frenum muscle indicator part 36 so as to fix the location thereof, as it is moved with the parts 37 and 38.

Mounted on the flexible portions 24 and 25 of the second indicator or lower or incisal edge indicator, are the mouth corner indicator means 46 and 47, which members 46 and 47 include the portions 48 and 49 arranged to slide along the flexible portions 24 and 25, and are rotatable on said flexible members into the dotted line positions as indicated in FIGURE 5. By reason of the conformation of the parts 48 and 49 the means 46 and 47 remain in such dotted line positions as desired and for purposes to be subsequently explained.

Indicia in the form of scales 50 and 51 are arranged for cooperation with the indicator means 46 and 47 respectively. Numbers for reference to the indicia are likewise provided, based on a central zero reference point.

The explanation of the detailed parts of the measurement device having been heretofore set forth, the application and use of the same will now be explained in conjunction with the bite block as indicated in FIGURE 6 and in FIGURE 9, when said device is in place thereon.

The dentist, as previously indicated has caused the device 5 to be affixed as indicated in FIGURES 6 and 9 on the bite block and thereafter the bite block is placed in the patient's mouth in the position to be occupied by the denture in the final fitting thereof. The dentist thereafter causes the patient to move the upper lip into the position of a smile, called the high lip position and thereafter adjusts the member 18 so as to be opposite such high lip position to be maintained in such position by means of the positioning instrumentalities 14 and 15.

Subsequently the dentist causes the patient to move the lip into lower or normal at rest position, and adjusts the lower member 20 so as to lie about opposite the edge of the lip. The upper portion of the members 24 and 25 denoted 24a and 25a respectively are aligned visually by the dentist with the lip edge and the lower portions of such members 24 and 25 designated 24b and 25b respectively are thereby representative of the positions which the incisal edges of the teeth should assume these latter portions being hidden by the lip at this time and providing a line corresponding to the incisal edges of the upper teeth in the denture. As will be readily understood by those skilled in the art, the incisal edges of the natural teeth are normally just barely visible when the person's mouth is not unusually distended and this condition is similarly desirable to simulate in dentures likewise.

Since the six anterior teeth are the most often visible teeth, the total over all extent and position of such anterior teeth often is an important factor desirably determined by a device of this nature.

For the purpose of determining the width of the six anterior teeth, the mouth corner indicator means including the parts 46 and 47 are placed in the dotted line positions of FIGURE 5 and the patient caused to close his mouth. Thus the indicators will be in the positions as indicated in FIGURE 7, the indicators extending through the lips and being positioned by the dentist in the extreme corners of the mouth.

After this positioning of the members 46 and 47 has

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been caused to take place, the dentist next turns back the upper lip of the patient and positions the third or frenum muscle indicator 36 including the knob 43 opposite said frenum muscle, moving the parts 37 and 38 transversely along the parts 18 and 20 of the first and second indicators as necessary. This will determine the centerline of the six anterior teeth.

The dentist thereafter removes the bite block including the parts 3 and 4 from the patient's mouth and turns the members 46 and 47 or lip wings so that the same assume the positions indicated in FIGURE 4 and FIGURE 6 along and adjacent the indicia 50 and 51 respectively. The members 46 and 47 are curved somewhat outwardly so as to add sufficient length to the measurement indicated from the central sections which is from corner to corner of the mouth to provide adequate over all width from outer edge to outer edge of the end anterior teeth, to thus conform to accepted dental practice.

From the nature of the second or lower or incisal edge indicator, which is flexible in nature, it will be seen that said indicator thus will readily follow the contour provided by the lips, which contour after all is representative of the incisal edges of the teeth, and thus actually reproduces the desired positions thereof for duplicating purposes.

In connection with the foregoing, the bite block with the device 5 thereon is removed from the patient's mouth and the dentist thereupon enters on a suitable record form such as indicated in FIGURE 8 at 60, the necessary indicia including the positions of the devices 46 and 47 to define the width of the six anteriors. In this instance the lip wings refer to the 36 and 37 millimeter positions respectively and in fact a very large mouth and exemplary only since this would be most unusual.

The high lip line indicator is shown as having been positioned opposite the number 11 of the indicia 34 and 35, this likewise being indicated upon the record form 60.

The incisal edge or second indicator, will necessarily have three readings, the one for the left side of the mouth being opposite the number 3 as indicated by the pointer 31, the central indicator portion 20 opposite the number 5, and the right side pointer 30 being opposite the number 3 likewise.

Since the frenum muscle indicator 36, in the position shown in FIGURE 4 is on the center, the reference number in that case will be zero. The record form 60 is provided in triplicate so that one of the forms may be retained by the dentist, a copy of the form being provided to the patient and the other copy of the form supplied to the laboratory to which the model and bite block are returned. The body 7 of the device hereof remains fastened to the bite block for purposes to be subsequently explained. The dentist may remove the indicators and parts connected therewith by slipping them off of the guide means provided as will be understood from a consideration of FIGURE 4, since the guide members are arranged to permit the members to slide upwardly out of engagement with the guides provided and thus removed for sterilization purposes. The same indicator parts are transferable after sterilizing, to bodies including the various indicia and guide means thereon separately provided and thus individually permitting fittings on the respective bite blocks of different patients.

When the laboratory receives the bite block and model as shown in FIGURE 9 duplicate indicator parts owned by the laboratory or technician are placed upon the supporting parts therefor. The technician moves the parts to correspond with the readings on the record card 60, to position the upper member 18 opposite high lip line reading 11, the frenum indicator member 36 is located on center or zero, and the lower or second indicator is positioned to correspond with the indicia provided as will be readily understood, by the incisal edge location references on the record card.

Thereafter the technician manipulates a pair of dividers, 75

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so as to scribe the incisal edge indication denoted 65 on the model body, in the form of a line actually engraved in the surface of the model body 1, and following the contour of the lower portion or incisal edge locating portions 24b and 25b which are provided by the flexible portions 24 and 25 as well as the portion 20 centrally thereof.

The technician next transposes the positions of the ends of the mouth corner indicator means 46 and 47 directly upwardly thereof also onto the face of the model in the form of engraved lines 66 and 67.

Correspondingly the location of the frenum muscle indicator or third indicator 36 is similarly engraved as a vertical line at 68 and the dividers are used to engrave a horizontal line at 69 which is below the upper edges of the teeth or in actuality the so-called high lip line.

The technician will thereafter remove the measurement device 5 from its position as shown in FIGURE 9, and by means of the dividers transfer the line 65 onto the wax member 4, as indicated at 65a, the lines 66 and 67 being extended downwardly so as to appear at 66a and 67a respectively on the wax member 4. Similarly the line 68 will be extended downwardly to 68a and the line 69 will be transposed by the dividers as indicated at 69a.

The technician will thereafter position the teeth such as indicated at 70, 72, 74, and 71, 73, and 75, these teeth comprising the six anteriors or the so-called one by six combination or set. These teeth may be of the shape to properly fit the patient's facial contours in accordance with accepted dental practice. The incisal edges of the teeth are located along the line 65a, corresponding to the portion 24b, the lower part of 20 and the lower portion 25b, reference being had at this point to FIGURES 4 and 9.

With the teeth thus located, the other teeth to be provided in the denture may be suitably arranged. Since the locations of the teeth of the one by six are the most critical from an appearance standpoint, the said teeth will thus most nearly simulate the positions properly desired by the technique heretofore indicated.

The technician will thereafter supply the bite block to the dentist and the said bite block is positioned in the patient's mouth to ascertain the correctness of the appearance provided and slight adjustments being thereafter made as necessary.

It will be apparent from the foregoing that the most accurate possible positioning of the teeth is provided for by the invention hereof, since the incisal edges are precisely located, the location of the center of the mouth as indicated by the location of the frenum muscle is ascertained, and the over all width of the six anterior teeth is likewise accurately measured and indication provided therefor.

Heretofore no such instrument has been available for such measurement for dentures and as will be readily understood the desirability of the same is clearly apparent and the mechanical ability of the dentist is assisted by the device hereof.

When the dentist is satisfied that the bite block is now in proper condition with the teeth located thereon, the same is subsequently returned to the laboratory and the teeth invested in the plate material to thereby provide a finished denture for subsequent fitting and use by the patient.

The various parts of the device may be sterilized together or separately as the case may be and made of any suitable material which will make possible such sterilization and use for the purposes set forth.

I claim:

1. In a denture measurement device of the class described, in combination, an elongated relatively thin body to be placed in the mouth of a patient behind the lips with its longitudinal axis in a generally horizontal position, means to fixedly position said body relative to the lips, a first lip line indicator connected to the body and including an upper lip contacting element mounted for movement to selected vertical positions transversely with respect to the

longitudinal axis of the body, means to maintain said indicator in said selected position, a second lip line indicator connected to said body vertically spaced with respect to said first indicator and including a lower lip contacting element mounted for movement to selected vertical positions on said body transversely with respect to the longitudinal axis thereof, retaining means on said second indicator to maintain said second indicator in a selected position, means on said body cooperating with each of said lip contacting elements for indicating the position of each of said lip contacting elements with respect to said body, guide means connected to said body, a frenum muscle contacting element mounted on said guide means and adjustable vertically and horizontally relative to said body, and means to retain said frenum muscle contacting element in a selected position relative to said body.

2. The combination as set forth in claim 1, wherein a pair of lip corner indicating elements are adjustably mounted, one on each of the respective ends of the second indicator for adjustment to selected indicating positions relative to the patient's lip corners to define the desired position of the six anterior teeth.

3. The combination as claimed in claim 1, wherein said second lip indicator includes a pair of flexible portions, said anterior teeth width indicator elements pivotally supported on said flexible portion so as to move between selected positions.

4. The combination as claimed in claim 1, wherein centrally positioned guide means are mounted on the body, the first indicator movably mounted on said guide means for vertical movement thereon relative to said longitudinal axis of said body, said second indicator movably mounted on said guide means, opposite ends of the second indicator being vertically movable on guides fixed to the body, and separate indicia on the body cooperate with said ends.

5. The combination as claimed in claim 4, wherein a pair of anterior teeth width indicator elements are adjustably mounted, one of said indicator elements of said pair on each of said flexible portions of said second indicator for movement thereon in a direction substantially parallel to said longitudinal axis of said body portion.

6. The combination as claimed in claim 5, wherein mouth corner indicator means including anterior teeth width indicating elements are mounted on the second indicator and are cooperable with indicia on the body for determining the position of the six anterior teeth and the total width thereof.

7. In a denture measurement device of the class described, in combination, an elongated relatively thin body to be placed in the mouth of a patient behind the lips with its longitudinal axis in a generally horizontal position, means to fixedly position said body relative to the lips, a first lip line indicator connected to the body and including an upper lip contacting element mounted for movement to selected vertical positions transversely with respect to the longitudinal axis of the body, means to maintain said indicator in said selected position, a second lip line indicator connected to said body vertically spaced with respect to said first indicator and including a lower lip contacting element mounted for movement to selected vertical positions on said body transversely with respect to the longitudinal axis thereof, retaining means on said second indicator to maintain said second indicator in a selected position, means on said body cooperating with each of said lip contacting elements for indicating the position of each of said lip contacting elements with respect to said body, a frenum muscle contacting element mounted on said first and second indicators and adjustable vertically and horizontally relative to said first and second indicators and means to retain said frenum muscle contacting element in a selected position relative to said indicators.

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