Dec. 20, 1955 E. B. CLARK 2,727,307

HINGE AXIS LOCATOR

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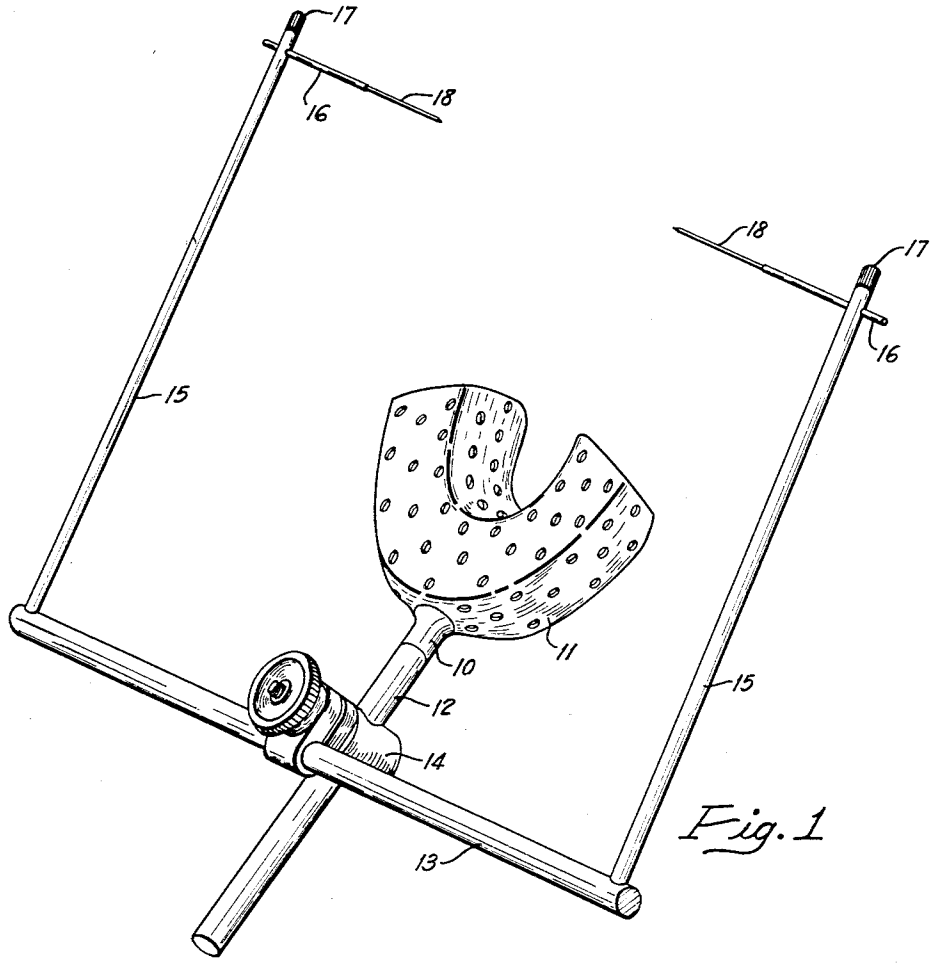


Fig. 1

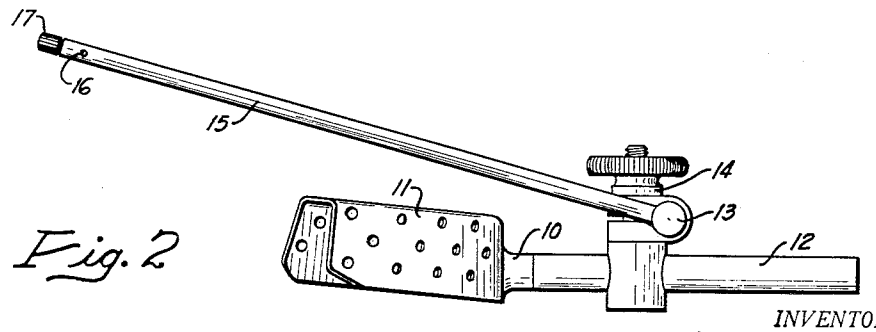


Fig. 2

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HINGE AXIS LOCATOR

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This invention relates to a dental appliance to be used in locating the hinge axis of the human lower jaw.

In certain types of restorative dentistry it is necessary to locate accurately the true hinge axis of the lower jaw. This axis, in extact relation to the patient's "bite," must be transferred to an articulator having parts that simulate the action of the patient's jaw so that the dentist can build a replica of the patient's "bite" in the articulator.

Devices have previously been proposed to locate this hinge axis, but these devices have been heavy and cumbersome and have required considerable time to locate the hinge axis accurately. Because of their complicated nature, involving many mechanical parts made to very accurate dimensions, they have been expensive.

The present invention provides a hinge axis locator that is simple and inexpensive, of light-weight construction, and which can be easily and quickly manipulated to locate the hinge axis of the lower jaw.

Further objects and advantages of the invention will become apparent as the description proceeds.

In the drawings:

Fig. 1 is a perspective view of the hinge axis locator attached to a dental tray.

Fig. 2 is a side elevation of the device shown in Fig. 1.

Construction

In a preferred form of the invention, as shown in the drawings, a stud **10** is soldered or otherwise secured to the impression tray **11**, which is otherwise of usual construction. The stud **10** has a threaded socket into which fits a threaded end formed on stem **12**.

A cross bar **13** is secured by a universal clamp **14** to stem **12**, the clamp being movable both rotatably and slidably on the stem **12**.

A side arm **15** is attached to each end of the cross bar by a screw thread or any other preferred connection. As shown in the drawings, these arms lie in a single plane and are parallel to each other. The cross bar **13** and side arms **15** may, of course, be formed from a single piece of material if preferred.

The outer end of each side arm **15** is drilled to accommodate an axis pointer **16**, and a set screw **17** holds each pointer in place. The two pointers **16** project inwardly on a common axis at right angles to the side arms **15**. Each pointer has a heavy base portion engaged by set screw **17**, and a thin, needle-like extension **18**. The pointers are formed of some suitable material that is dead soft, without appreciable resilience, so that they will stay in any position to which they may be pushed without springing back to any appreciable extent. For example, the pointers may be formed of 24 carat gold, in which case they should be annealed before each use, to insure their being in dead soft condition.

It is advantageous to have the device as light in weight as possible, and therefore all of the parts are preferably made of some strong yet light-weight material such as an alloy of aluminum or magnesium. But in some cases it

may be desirable to form some of the parts, such as the universal clamp **14** and the screws **17** from ferrous metal.

Since the hinge axis locator of the present invention contains few and simple parts, when they are made of light-weight material the device is of extremely light weight. Because of this light weight it is possible to use an ordinary impression tray and ordinary impression material to attach the device to the patient's lower jaw. With the heavy, cumbersome devices of the prior art it has been necessary to use special castings to attach the axis locator to the patient's jaw.

Additional advantages of light weight are that lightness adds to the patieint's comfort and assists in obtaining a quick and accurate reading, since it is easier for the patient to relax his jaw muscles.

Operation

In using the hinge axis locator the device is separated from the impression tray **11**. The tray **11** is first filled with suitable impression material and is applied, in the position indicated in Fig. 2, over the teeth of the lower jaw of the patient. When the impression material sets it forms a sufficiently strong attachment of the tray to the jaw to permit carrying out the following operations.

The stem **12** is now secured to the tray by screwing its end into the threaded socket of the stud **10**, and the frame of the locator is attached to the stem **12** by means of the universal clamp **14**.

The human lower jaw, in opening, first rotates on a hinge axis until the jaw has opened about one-half of an inch, after which the jaw can slide forward away from the axis. It is the function of the device of the present invention to locate accurately this hinge axis.

When the dentist first applys the apparatus to the stem **12** he moves the frame in the universal clamp **14** until the axis pointers **16** point approximately at the hinge axis. He then tightens clamp **14**, and the arms **15** will be approximately in the position illustrated in Fig. 2. The clamp **14** therefore serves as a "coarse" adjustment of the device.

The dentist now assists the patient in opening and closing his jaw on the hinge axis. As he locates this axis, the dentist moves the soft projecting ends **18** of the pointers **16** until their inner ends cease to move, at which time they point exactly at the hinge axis of the lower jaw.

Due to the fact that they are formed of dead soft material, without appreciable resilience, the ends **18** of the pointers do not spring back, but remain in the position to which they are pushed by light finger pressure. The pointers **16** can therefore be brought very quickly and easily to a position in which they point accurately at the hinge axis. The pointers **16** thus serve as a "fine" adjustment for the hinge axis locator.

After the hinge axis has been located the device is removed from the patient without bending the pointers **16**. The axis, thus located, can now be transferred to an articulator to assist the dentist in building a replica of the patient's "bite" in the articulator. Or, if preferred, ink spots can be placed on the cheeks of the patient, and the axis thus located can be transferred by means of a transfer face bow.

The device of the present invention provides a hinge axis locator that has a low first cost and low operating costs. It is convenient for both patient and dentist, and locates the hinge axis in a minimum amount of time.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended

claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A hinge axis locator comprising: an impression tray having a stud secured thereto, a stem detachably connected to the stud, a frame secured to the stem by a universal clamp, the frame including a cross bar and two side arms, and an axis pointer carried by each side arm, the axis pointers projecting inwardly along a common axis, and being formed of dead soft bendable material.

2. A device as recited in claim 1 in which the axis pointers are formed of gold, of a fineness of approximately 24 carat.

3. A device as recited in claim 1 in which the stem, frame and universal clamp are formed of light-weight material.

4. A hinge axis locator comprising: a stem adapted to be rigidly attached to the lower jaw of a patient, a frame secured to the stem by an adjustable connection which forms a "coarse" adjustment, and a pair of axis pointers carried by the frame, the axis pointers projecting inwardly along a common axis, and being formed of dead soft bendable material to form a "fine" adjustment to locate the hinge axis of the lower jaw.

5. A device as claimed in claim 4 in which the axis pointers are formed of gold, of a fineness of approximately 24 carat.

6. A device as claimed in claim 4 in which the stem and the frame are formed of light-weight material.

7. A hinge axis locator comprising: an impression tray of the usual type adapted to be secured over the teeth of a lower jaw by the usual impression material, the impression tray carrying a stud which projects over the chin of the patient, a stem detachably connected to the stud, a universal clamp attached to the stem and serving as a "coarse" adjustment in locating the axis, a frame attached to the clamp, the frame having two side arms which extend in the same plane, an axis pointer detachably connected to the outer end of each side arm, the axis pointers projecting inwardly along a common axis, and being formed of dead soft bendable material to form a "fine" adjustment to locate the hinge axis of the lower jaw.

8. A device as recited in claim 7 in which the axis pointers are formed of gold, of a fineness of approximately 24 carat.

9. A device as recited in claim 7 in which the stem, universal clamp and frame are formed of light-weight metal.

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