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[54] **SUPPORT STRUCTURE FOR DENTAL MODELS**

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[51] **Int. Cl.** **A61c 11/00**

[58] **Field of Search** ..... 32/15, 32, 70; 220/31 SR

[56] **References Cited**

UNITED STATES PATENTS

1,045,586	11/1912	Montague	32/32
3,043,009	7/1962	Whitman	32/32
3,256,892	6/1966	Esposito Jr.	220/31 S

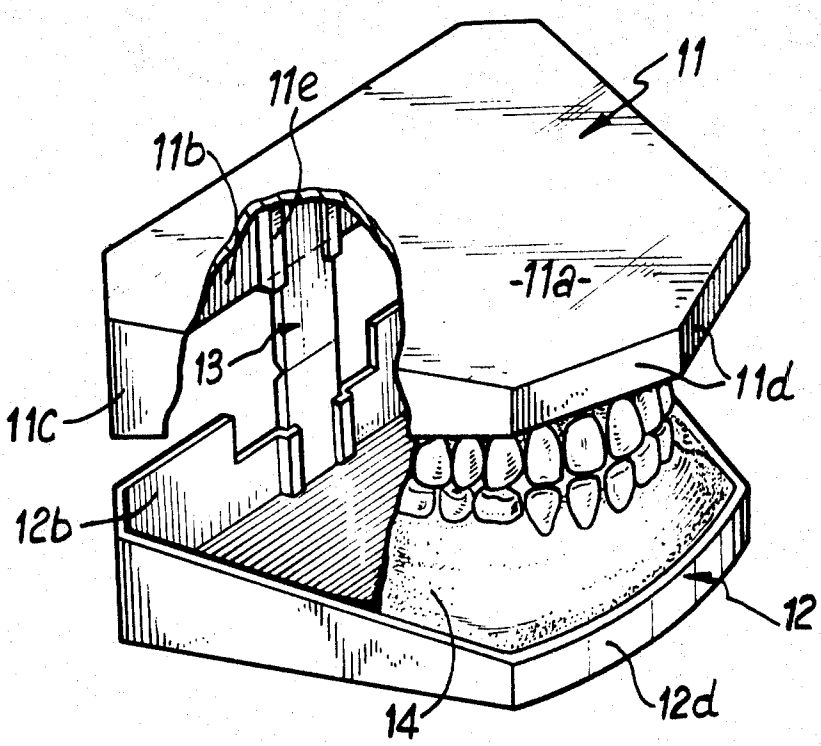
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[57] **ABSTRACT**

A support structure for orthodontic models comprises two trays arranged in opposed disposition and pivotally connected together by a hinge means which permit relative motion of the trays in simulation of the relative movement of upper and lower jaws. The hinge means is separable from at least one of the trays in a manner such that the trays can be separated linearly as well as pivotably. The hinge means is a one-piece, normally rectilinear hinge plate having each opposite end slidably received in rectilinear guide means on the rear wall of each tray.

7 Claims, 1 Drawing Figure



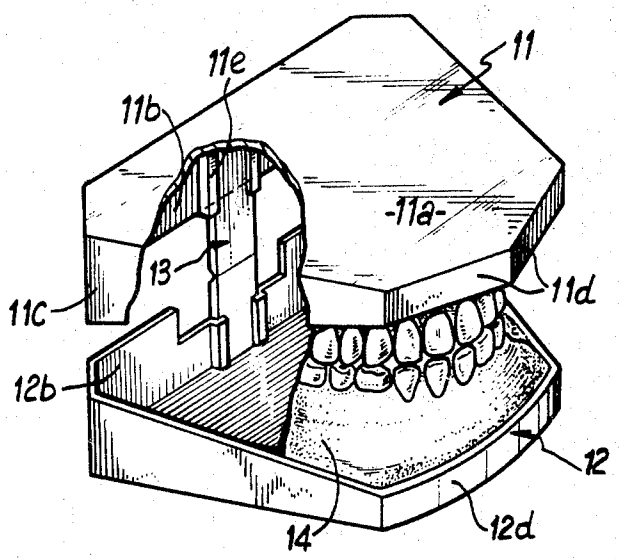


FIG. 1

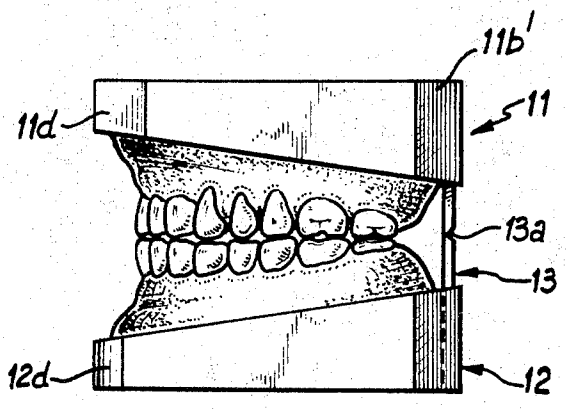


FIG. 2

SUPPORT STRUCTURE FOR DENTAL MODELS

This invention concerns a support structure for dental models, and has more particular reference to an arrangement having relatively movable upper and lower parts each to receive a respective dental model.

The primary object of the present invention is to provide a simple, yet effective, support structure which will facilitate the examination, comparison or shaping of dental models and will provide an accurate diagnostic aid.

According to the present invention, a support structure for use in orthodontics and comprising opposed tray-like parts each to receive a respective dental model is characterized by a hinge plate secured with the said parts and separable from at least one of said parts in a manner such that the trays can be separated linearly as well as pivotably.

According to a preferred feature, the hinge means comprises a one-piece, normally rectilinear hinge plate having a line of weakness extending transversely thereof to define a pivot axis.

While the hinge means may be secured relative to the tray-like parts by a model located therein, we prefer, in order to ensure ready separation of such parts when required, to provide a guide means in at least one part arranged slidably to receive a hinge plate. Usually the guide means will be disposed at the inner surface of the rear wall of one of the tray-like parts but such means can, if preferred be provided at the outer surface of such wall.

The invention will now be described further, by way of example only, with reference to the accompanying drawings illustrating one embodiment thereof and in which:

FIG. 1 is a perspective view, partly broken away, of a support device constructed in accordance with the present invention shown in its assembled form and with dental models positioned therein, and

FIG. 2 is a side elevation of the arrangement shown in FIG. 1.

Referring now to the drawings, a support device for dental models comprises opposed upper and lower tray-like parts **11, 12** pivotably connected together by a hinge-plate **13.**

The upper tray-like part **11,** which part is offered in inverted disposition for co-operation with the lower such part **12,** has a flat base **11***a* and a wall structure about the periphery thereof, the said wall structure comprising a rear wall **11***b*, forwardly converging sidewalls **11***c*, and mutually inclined front wall portions **11***d*, the lateral extremities **11***b* of the rear wall extending forwardly to join the side walls. The rear wall and front wall are of different, but uniform, height from end-to-end, whilst the side walls are of reducing height towards the front wall.

A guide formation **11***e*, intended slidably to receive the hinge-plate **13,** is provided at the inner face of the rear wall **11***b*, such guide formation **11***e* comprising spaced ribs, each of L-shaped cross-section, arranged in parallel disposition and formed integrally with the upper tray-like part.

The lower tray-like part **12** differs from the upper such part in two material respects. Firstly, the rear wall **12***b* is of stepped configuration as distinct from being of uniform height throughout its full length, whilst secondly the front wall **12***d* is curved, when viewed in

plan. If desired, the guide formation **12***e* corresponding to that formation **11***e* provided in the case of the upper tray-like part may be omitted from the lower such part, to give a third difference, additional to those specified above.

Conveniently the tray-like parts **11, 12** are moulded from synthetic plastics material, a suitable material being polythene.

The one-piece normally rectilinear hinge plate **13** is generally rectangular and of a uniform width and thickness appropriate for free sliding engagement with the rectilinear guide formations **11***e* **12***e*. The length of the hinge-plate is determined by the dimensions of the tray-like parts and the intended separation of such parts when in use. A transverse channel **13***a*, of generally V-shaped cross-section, is formed in one face of the hinge-plate to give a line of weakness which defines a pivot axis along which the plate will fold.

In use, the hinge-plate **13** is located relative to the upper and lower plate-like parts **11, 12** by engaging the same with the guides **11***e* **12***e* provided in such parts. The upper and lower plate-like parts can be pivoted, one relative to the other, to provide for a ready access to the dental models formed in the plaster **14** present in the respective parts, both for inspection and also to simulate the relative movement of upper and lower sets of teeth, for comparison purposes. When it is required to completely separate the upper and lower plate-like parts, this can be effected quite simply by linearly disengaging the guide formation of the upper part from the uppermost portion of the hinge-plate.

The linear movement of the tray-like parts allows models to be built up in a manner which avoids the need for lateral adjustment of the models relative to the tray, plate, or base-like parts, as the upper wax-bite can be located on the lower wax-bite before plaster is set against the upper work-bite. Model positioners and position relators are not required.

By making the rear walls of the tray-like parts flat and by providing the hinge plate **13** internally of those walls, a smooth planar surface at the rear of the structure is provided so that the structure and models, when set, can be stored in a stable manner on the rear wall of the structure.

I claim:

1. A support structure for orthodontic models comprising:

upper and lower tray-like parts, each having a rear wall and a base, pivotably connected together by a hinge plate secured to the rear walls so that the upper tray-like part is offered in inverted disposition for cooperation with the lower tray-like part;

a guide formation in at least one of said traylike parts to receive and secure slidably said hinge plate; and

means securing the hinge plate to the other of said tray-like parts so that, with models set up on the tray-like parts, pivoting movement of the models can be effected by pivoting of said hinge plate and the models can be moved linearly towards and away from each other by sliding of said hinge plate in said guide formation.

2. A support structure as claimed in claim **1** in which:

said means securing the hinge plate comprises a second guide formation.

3. A support structure as claimed in claim 1 in which:

the rear walls of the tray-like parts are flat and coplanar; and

the hinge plate and guide means are on the inside of the rear walls, thereby leaving a smooth planar surface at the rear of the structure so that the structure and models can be stored in a stable manner whilst resting on the rear wall of the structure.

4. A support structure as claimed in claim 1 in which:

said hinge plate defines a transverse channel to give a line of weakness defining a pivot axis about which said plate can hinge.

5. An orthodontic articulator of the type having a pair of opposed trays connected by a separable hinge and characterized by:

a one-piece, flat, normally rectilinear hinge plate forming said hinge; and

guide means extending along the rear wall of each said tray in a direction normal to the bottom wall thereof, each slidably receiving one opposite end of said hinge plate;

said hinge plate being hinge foldable centrally thereof and either of said trays being slidably removable, or pivotable, away therefrom.

6. An articulator as specified in claim 5, wherein:

said hinge plate is of uniform width and thickness from end to end, except for a transverse channel centrally thereof forming a weakened hinge fold line therein.

7. An articulator as specified in claim 5, wherein:

each said guide means comprises a pair of integral ribs of L-shaped cross section forming channels on the inside of the rear wall of each tray adapted to slidably retain the adjacent end of said hinge plate.

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