July 15, 1969 D. G. COBURN 3,455,620

DENTAL OPERATING UNITS

Filed July 13, 1966 3 Sheets-Sheet 1

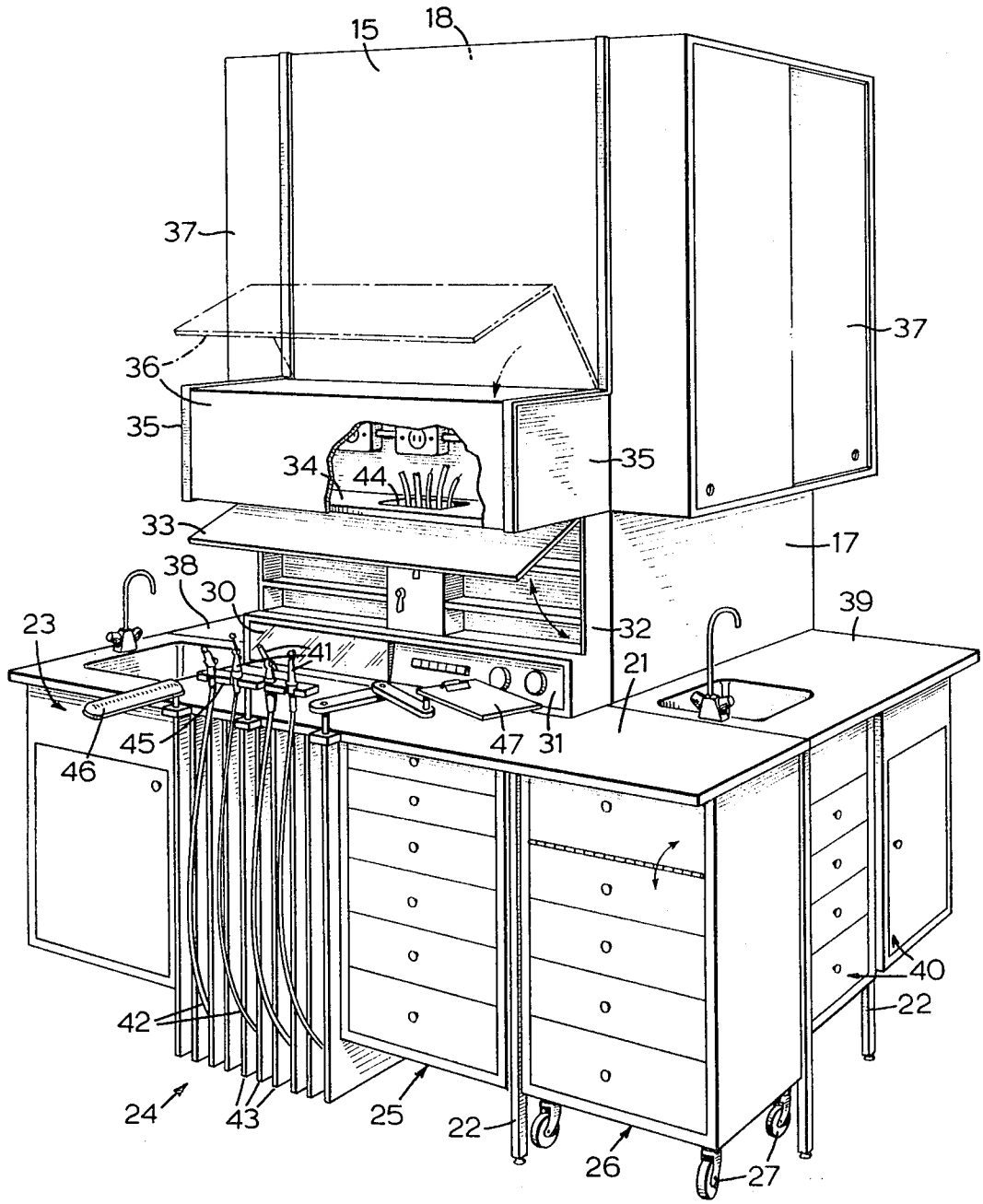


FIG. 1

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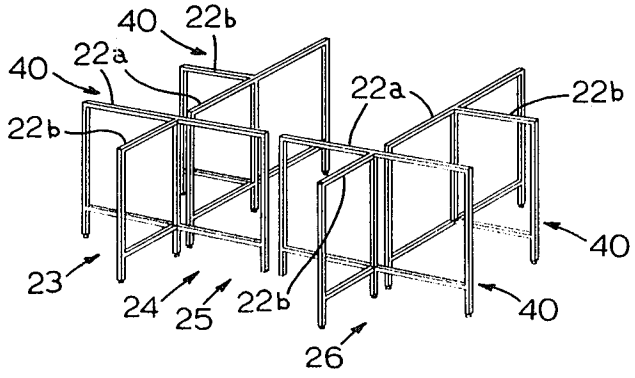


FIG. 2

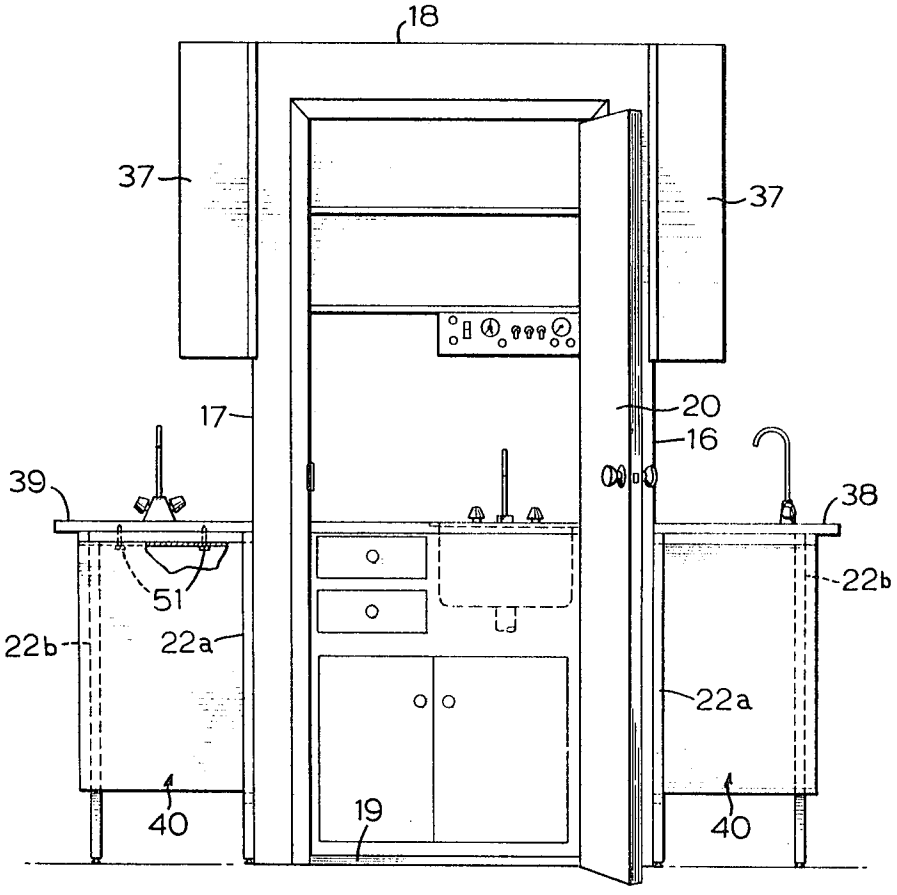


FIG. 3

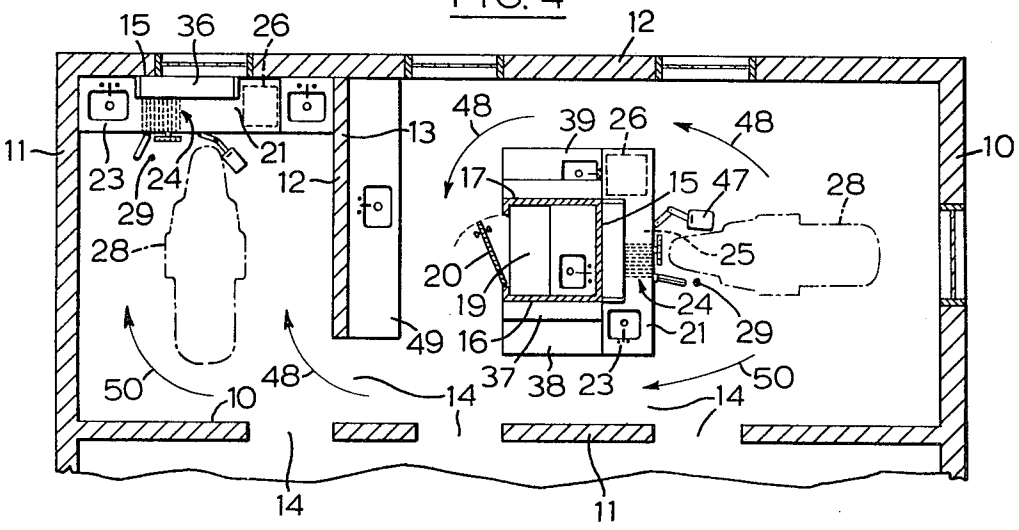
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DENTAL OPERATING UNITS

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FIG. 4



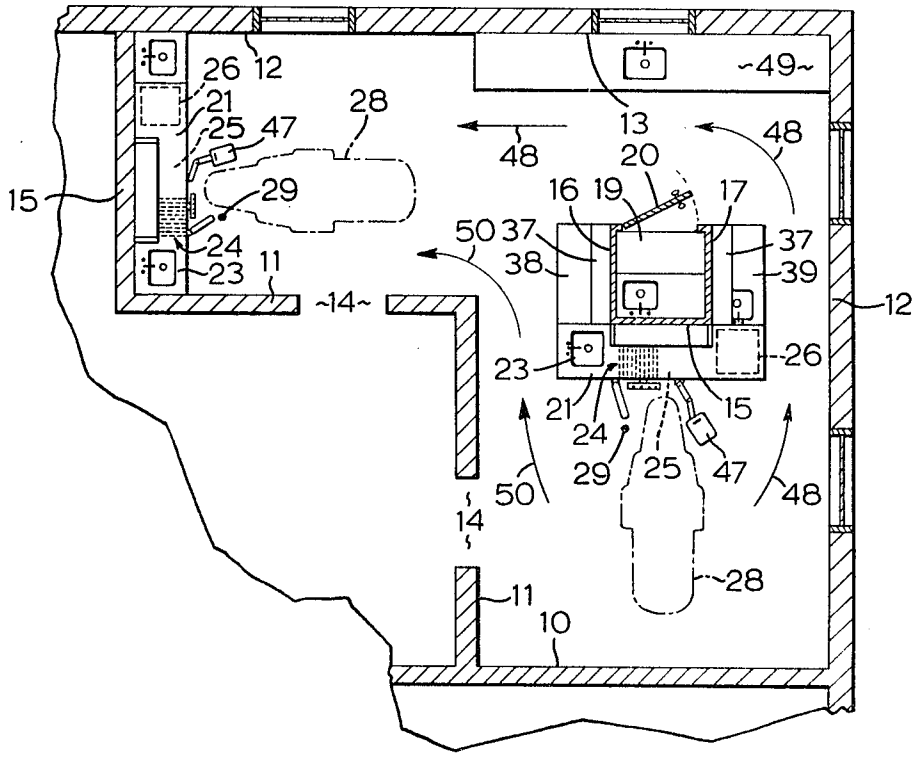


FIG. 5

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DENTAL OPERATING UNITS

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U.S. Cl. 312—209 15 Claims

ABSTRACT OF THE DISCLOSURE

A dental operating unit intended for use with a chair of the reclining type and to permit the dentist to operate seated; a waist high horizontal counter has the handpieces located immediately adjacent its front edge and a control panel immediately above it while the operating units for the handpieces are disposed in a compartment at eye level to a standing operator, the connections passing behind the control panel to the handpieces; the supporting unit frame may comprise a small darkroom having the counter, etc., mounted on one exterior wall; a preferred room structure has the darkroom as a free-standing unit centrally located in a room.

The present invention relates to improvements in dental operating units and in dentist's office layout.

For many years the type of patient's chair employed in dentists' offices has been one in which the patient is seated in a relatively upright position, a special cabinet being provided to one side of and in front of the chair for the accommodation of the various dental handpieces and their accompanying operating mechanisms; storage cabinets for other equipment are distributed wherever convenient around the office room. With such an arrangement the dentist usually stands and moves around the patient to the position most convenient for the procedure being performed. Dentists have recently begun to use a patient's chair of the so-called lounge type, in which the patient can be swung to a more nearly horizontal position, the dentist then being able to perform most of his work while seated in a relatively fixed position to one side and to the rear of the head of the chair.

It is an object of the present invention to provide a new form of dental operating unit, intended primarily for use with such a lounge type of chair.

It is another object of the invention to provide a new form of dental operating unit constituting a removable free-standing unit and comprising also a darkroom.

It is a further object of the invention to provide a new dentist's office layout particularly adapted to utilize the advantages of my new dental operating unit.

In accordance with the present invention there is provided a dental operating unit comprising a frame, a horizontal elongated work surface mounted by said frame approximately at a normal waist height, storage means beneath said work surface for dental handpieces, a component storage means mounted by said frame above the said work surface between the level of the surface and eye level, and supply connections connecting components in the component storage cabinet with respective handpieces stored beneath the said work surface.

Also in accordance with the present invention there is provided a dental operating unit comprising four walls and a top constituting a darkroom enclosure having an access door in one wall, a horizontal work surface mounted along one wall that does not include the access door, and dental component storage means mounted along the said one wall.

Further in accordance with the present invention there

is provided a dentist's office layout comprising a four-walled room, a four-walled free-standing darkroom enclosure disposed within the room with each wall of the enclosure facing a respective wall of the room, a first of the enclosure walls having an access door therein, a work surface approximately at a normal waist height on the exterior of a second enclosure wall opposite to said first enclosure wall, storage means beneath the said work surface for dental handpieces, and a dentist's chair of the lounge type disposed between the said second enclosure wall and the respective room wall.

Particular preferred embodiments of the invention will now be described, by way of example, with reference to the accompanying drawings wherein:

FIGURE 1 is a perspective view of a complete dental operating unit, as seen from the front somewhat to one side,

FIGURE 2 is a view in the same perspective, but showing only T-shaped frame members which support the work surfaces and sub units of the dental unit of FIGURE 1,

FIGURE 3 is a rear elevation of the unit as shown in FIGURE 1, and

FIGURES 4 and 5 are two different office layouts employing dental operating units in accordance with the invention in conjunction with a patient's chair of the lounge type.

The dental operating unit usually is located in a room of conventional rectangular plan comprising walls **10**, **11**, **12** and **13** and at least one access door **14**, the unit comprising a front wall **15** facing the room wall **10**, side walls **16** and **17** facing the room walls **11** and **12** respectively, a top **18**, a floor **19** and an access door **20** facing the room wall **13**, the door also constituting the fourth wall of the enclosure that is thereby formed. The enclosure is made suitably light-tight, so that it can function as a darkroom, the interior being provided with conventional lighting and ventilating means (not shown), and with the usual processing equipment for the development of dental X-ray plates. The unit stands freely within the room and is square in plan for reasons which will become apparent hereinafter. On the front wall **15** there is mounted, at a convenient waist level height, a horizontal elongated principal work surface **21**, the surface being supported by two vertically extending generally T-shaped frames **22**, disposed with their cross bars **22***a* coextensive and generally parallel to the front wall, while the foot **22***b* of each T-shaped member forms, in effect, an extension of a respective side wall **16** or **17**.

As mentioned above the enclosure is square in plan, so that its walls are all of the same width. The working surface **21** extends beyond the feet of the T-members to give knee room, but generally its length is twice the width of an enclosure wall, while its depth is half the enclosure wall width. Similarly, the length of each T-member cross-bar is approximately an enclosure wall within, while the foot is approximately half a wall width.

The work surface is provided at one end with a conventional fixed sink subunit **23** for use by the dentist and may have a storage cupboard below the sink, the sink and cupboard fitting within the space bounded by one half of the cross-bar **22***a* and the foot **22***b* of the corresponding T-shaped frame. A louvered storage subunit **24** for the accommodation of the usual dental handpieces is disposed in the space between the other half of the cross-bar of the same T-shaped frame and the foot thereof, while a drawer storage subunit **25** is located beneath the work surface in the space between one half of the cross-bar and the foot of the other T-shaped frame. A movable drawer storage subunit **26**, mounted on castering wheels **27**, is accommodated in the remaining space beneath the work surface.

The widths of all of these four subunits are substantially the same, so that their locations can be interchanged at any time.

The location of the patient's chair **28** relative to the work surface **21** is shown in FIGURES 4 and 5, and it will be seen that a dentist sitting at the location indicated by the arrow **29** has immediately available to hand the sink subunit, the handpiece storage subunit, and the fixed drawer storage subunit. In addition, at any time it is possible for him or his assistant to transfer the removable storage subunit from its position beneath the work surface to some other position at which it is more convenient to hand. Also conveniently located with respect to this normal operating position is a small illuminated panel **30**, mounted on the enclosure wall **15** immediately above the work surface **21**, and comprising a station for the viewing of dental X-rays. At the same level as the viewing station is a control station **31** comprising a series of control switches and indicator lights for control of the various instrumentalities that supply the dental handpieces, e.g., with electricity, compressed air, thermostatically controlled warm water, etc.

Immediately above the viewing and control station a shallow shelf storage unit **32** is mounted on the wall **15**, and serves for the storage of small bottles of the medicaments, etc., most commonly required by the dentist and/or the assistant during dental operations. This storage unit can be closed by a cover **33** which is swung upwards to expose the shelves and latched to the underside of a shelf **34**, mounted on the enclosure wall **15** approximately at or just below normal eyelevel. The shelf **34** has end walls **35** and normally is concealed by a decorative cover **36**, the shelf constituting component storage means for mounting the above-mentioned instrumentalities required by the dentist for which the unit has been particularly arranged. Examples of such instrumentalities are an air and water supply for a high-speed turbine drill, a source of vacuum for suction apparatus, radio frequency cauterising equipment, etc. This equipment usually requires only an occasional adjustment, but is conveniently available at eye level when adjustment is to be made. A large cupboard storage unit **37** is mounted on each enclosure side wall **16** and **17**, approximately at eye level, for easy access by a person standing in front of it. At the same level as the principal work surface there is provided on each side wall a supplementary work surface **38** and **39**, respectively, which is mounted on a respective T-shaped frame **22** located beneath the work surface. Two further storage subnuits **40**, of the same size and interchangeable with the above-mentioned storage subunits, are mounted beneath each supplementary work surface. These further units **40** can be cupboard units or drawer units, as required, and may or may not be mobile units, each being accommodated in the space between the cross-bar and the floor of the corresponding T-shaped frame. One of the subunits **40** for the work surface **39** comprises another sink unit, which in this case will be the dentist's assistants.

Certain pieces of equipment commonly used by the dentist are referred to herein as handpieces, in that they are grasped by the dentist in operation. These handpieces are indicated herein by the reference **41** and each must be connected by a suitable respective supply connection **42**, e.g., for electricity, water or air, to associated control and supply apparatus. In a unit in accordance with this invention each of these handpieces **41** is associated with a corresponding space between two immediately adjacent ones of a plurality of vertically extending, parallel louvres **43** of the above-mentioned louvred storage subunit **24**. For example, a high-speed turbine drill handpiece has its connecting air and water supply hoses extending through a corresponding space between two louvres, these hoses passing upwards through a trunk **44** to the component storage means **34**, where the associated supply apparatus is located, the trunk **44** connecting the rear of the louvred unit **44**, the control station **31** and the storage means **34**. Similarly, a suction handpiece is supplied by a connecting hose that passes through another pair of the louvres, and the trunk **44** to a suction unit provided in the storage means **34**. The main connections for electricity, water and drainage for the dental unit are brought up through the floor of the darkroom enclosure, and thence to the control station and/or the storage means **34**, while completely hidden from view. Alternatively, when the darkroom is not employed, these main connections may pass within the wall of the room.

In a typical procedure the assistant will settle the patient in the chair **28**; upon entering the room the dentist will seat himself at his station and have immediately at hand, in a bracket member **45** supported from the work surface **21**, the particular handpieces which he will expect to use in the procedure to be performed. Other handpieces which are used less often are left in clips suitably mounted in the louvred unit **24**. Since the connection for each handpiece hangs freely as a large loop in its own space, there is no possibility of connections becoming tangled during repeated use thereof, and they will return freely into their respective spaces under gravity when the handpieces are replaced, without the need for returning weights, rollers or springs. The handpieces that are engaged in the bracket member **45** can be changed as required. The dentist also has conveniently near to hand an arm rest **46** and a clip tray support **47**, on which support the assistant can clip a prepared instrument tray. Each of the arm rest **46** and the support **47** are pivotally mounted relative to the work surface **21**, so that they can quickly be moved to the required position, or just as quickly pushed out of the way, the bracket member can be similarly mounted but is not so illustrated.

An X-ray unit (not shown) of conventional form may be suspended from the ceiling and swung into position when required. Upon completion of an X-ray session the exposed plates can immediately be taken by the assistant, along the path indicated by the arrows **48** between the enclosure wall **17** and the room wall **12**, to the darkroom, without passing the dentist or the patient. The assistant can return by the same route, washing her hands at the sink **40** as necessary, and mount the developed plates in the viewer **30** for observation by the dentist. A laboratory make-ready station **49**, comprising a work surface and storage, conveniently is located on the room wall **13** facing the enclosure access door **20**.

It is now common practice in a dentist's operation to provide two consulting rooms, so that a patient may be led into and settled comfortably in one room, while the dentist is performing a procedure on another patient in the other room. FIGURES 4 and 5 show two different 2-room layouts, the same parts in the two rooms being given the same reference numerals. It will be seen that with these layouts, upon completion of a procedure the dentist is able to move via the path indicated by the arrows **50**, directly from one room to the other, bypassing his sink **23** and supply station on the way. This move can be made without disturbing the work of his assistant, who remains on the other side of the patient. Upon completion of her own work the assistant is able to pass directly from her station by the alternative path indicated by the arrows **48**, passing her sink and supply station, the door **20** of the darkroom, and the laboratory make-ready station **49** to the second room, where she can then take up her station on the appropriate side of the new patient. Both the dentist and the assistant need only move in their respective paths, and do not obstruct each other, and yet each is able to perform all the procedure required and has access to all materials and equipment needed.

If at any time it is desired to change the location of the office, this is simply done, since the room in which the unit is located is unchanged, in most respects. Thus, the free-standing dental unit and darkroom can be disconnected from the main electricity and water and drainage supplies, dismantled and moved as an entity to an-

other room in a different location. Moreover, due to the completely modular construction, at any time any subunit can be interchanged with any other subunit. Reference again to FIGURE 3 will show a typical simple method of releasably mounting the subunits in the frames **22**, by means of suspension bolts **51**.

In the embodiment particularly described, the principal work surface **21** and its associated storage, etc., are effectively integral with the darkroom, but can also be used to constitute an independent unit housing the total equipment required for the practice of dentistry. It may be employed as a free-standing unit, and can then also function as a room divider, or may be installed against any wall of a room (as illustrated in FIGURES 4 and 5) to give a required traffic pattern.

What I claim is:

1. A dental operating unit comprising a frame, a member providing a horizontal elongated work surface having front and rear edges and mounted by said frame approximately at a normal waist height of a standing operator, storage means disposed adjacent the said work surface member front edge for mounting dental handpieces adjacent the said front edge thereof to be readily accessible to an operator in front of the member front edge, a component storage cabinet mounted by said frame above the rear portion of the said work surface member between the level of the work surface and the eye level of a standing operator for the reception of components operating respective ones of the said dental handpieces, control panel means carrying control means for the said components for access by the said operator, and supply connections connecting components in the component storage cabinet with respective handpieces stored beneath the said work surface member and with the said control means and passing from the said handpieces beneath the work surface member behind the rear edge thereof to the interior of said cabinet.

2. A unit as claimed in claim **1**, and comprising dental X-ray viewing means disposed immediately above the rear portion of the work surface member adjacent the control panel means, the said supply connections passing behind both the said panel and viewing means.

3. A unit as claimed in claim **2**, and comprising shelf storage means disposed between the panel and viewing means and the component storage cabinet.

4. A unit as claimed in claim **1**, wherein the said storage means beneath the work surface member comprises a plurality of parallel vertical louvres, the corresponding portion of each said supply connection extending as a freely hanging loop between a respective immediately adjacent pair of louvres.

5. A unit as claimed in claim **1**, and comprising a fixed sink subunit mounted in said work surface with storage beneath it, at least one drawer storage subunit mounted beneath the work surface and a mobile storage subunit adapted to be accommodated beneath the work surface and for withdrawal therefrom as required.

6. A unit as claimed in claim **5**, wherein the dental handpiece storage means, the fixed sink subunit, the fixed drawer subunit, and the mobile subunit are all of the same length so as to be interchangeable in position with one another.

7. A unit as claimed in claim **5**, wherein frame means for supporting the said work surface member comprise two T-shaped frame members disposed with their cross-bars coextensive with one another and extending longitudinally of the work surface member and with their feet parallel to one another and extending transversely of the work surface member, and each storage subunit is accommodated between the cross-bar and the foot of a respective T-shaped member.

8. A unit as claimed in claim **1**, wherein the said frame means comprises a darkroom enclosure constituted by at least four walls and a top with an access door in one wall, the said work surface member and the said component storage cabinet being mounted in association with one of the walls not including the access door.

9. A dental operating unit comprising four walls and a top constituting a darkroom enclosure and unit frame having an access door in one wall, a member providing a horizontal work surface having front and rear edges at approximately normal waist height of a standing operator mounted along one wall that does not include the said access door with the said rear edge adjacent the wall, means for mounting dental handpieces immediately adjacent the front edge of the work surface member to be readily accessible to an operator in front of the member front edge, a component storage cabinet mounted by the last-mentioned wall and for the reception of components operating respective ones of the said dental handpieces, control means for the said dental handpieces mounted by the unit frame for access by the said operator, and supply connections connecting respective handpieces with their control means and their components in the said cabinet.

10. A unit as claimed in claim **9**, wherein the said horizontal work surface member is mounted along the wall opposite to the wall including the access door, and supplementary horizontal work surface members are mounted along the other two walls to provide respective work surfaces coextensive with that of the first-mentioned work surface member.

11. A unit as claimed in claim **10**, wherein the said darkroom enclosure is of square cross section in plan, the first-mentioned work surface member is in length twice the width of the said walls and in depth half the width of the said walls and extends equal lengths beyond its associated wall, and each supplementary work surface member is in length the width of the said walls and in depth half the width of the said walls, thereby providing with the first-mentioned work surface member a U-shaped work surface embracing three walls of the enclosure.

12. A unit as claimed in claim **10**, wherein frame means for supporting the work surface members comprise four similar T-shaped frame members, each T-shaped member having a cross-bar approximately equal in length to the width of a wall and a foot approximately equal in length to half the width of a wall, two of said T-shaped members being disposed beneath the first-mentioned work surface member with their cross-bars coextensive with one another and parallel to the associated wall and with their feet extending parallel to one another and perpendicular to the associated wall, and each of the other two T-shaped members being disposed beneath a respective supplementary work surface member with its cross-bar parallel to the associated wall.

13. A dentist's office structure comprising a four-walled room, a four-walled free-standing darkroom enclosure disposed within the room with each wall of the enclosure facing a respective wall of the room, a first of the enclosure walls having an access door therein, a work surface member having a front and a rear edge disposed approximately at a normal waist height to a standing operator on the exterior of a second enclosure wall opposite to said first enclosure wall with its rear edge to the second enclosure wall, storage means immediately adjacent the front edge of the said work surface member for dental handpieces to be accessible to an operator in front of the work surface member, and a dentist's chair of the lounge type disposed between the said second enclosure wall and the respective room wall.

14. A dentist's office structure as claimed in claim **13**, and comprising an access door to the room in a wall associated with the said first enclosure wall or a third enclosure wall, wherein the dentist's chairside station is at the end of the work surface member nearer to the said third enclosure wall and a dental assistant's station is at the other end of the said work surface member.

15. A dentist's office structure as claimed in claim **14**,

and comprising a laboratory make-ready station on the room wall associated with the said first enclosure wall.

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U.S. Cl. X.R.

32—22; 52—34; 312—250, 257