

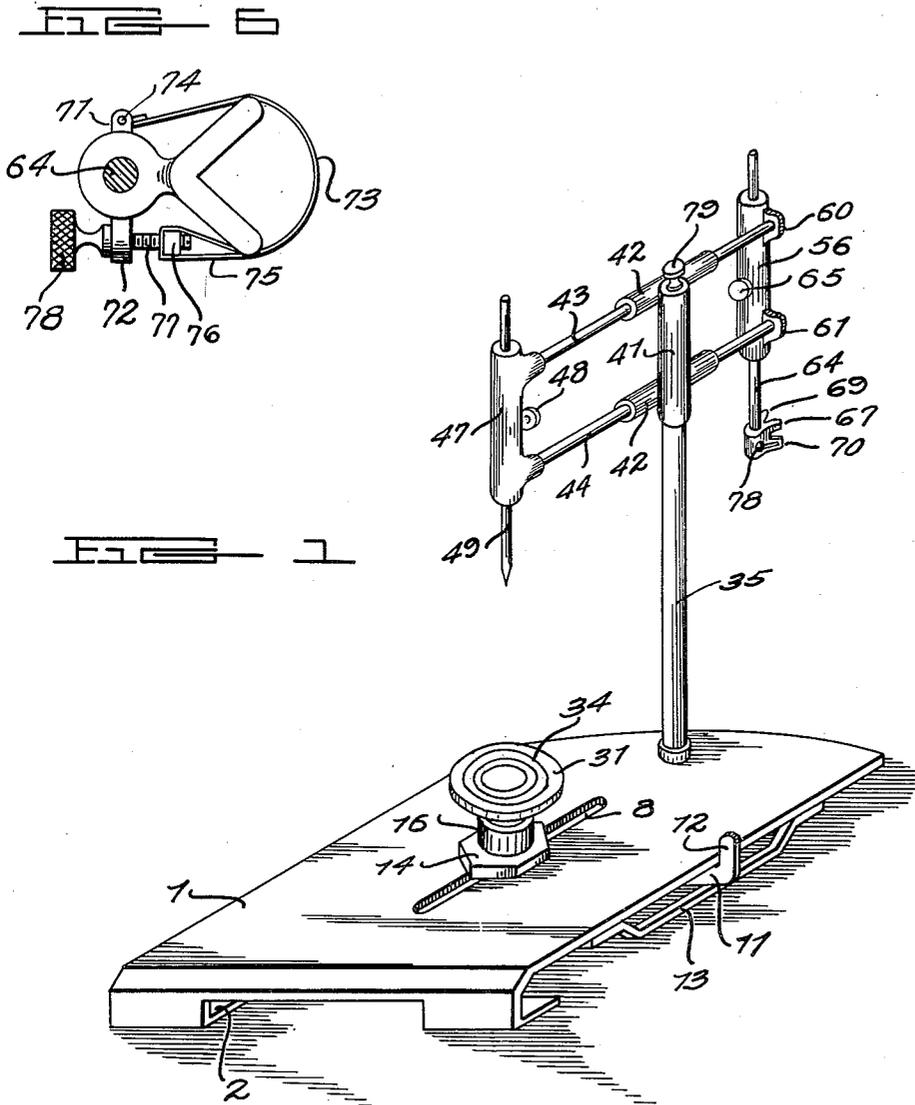
Oct. 31, 1950

E. C. HARRIS  
DENTAL SURVEYOR

2,528,053

Filed June 27, 1946

3 Sheets-Sheet 1



Inventor

ELMER C. HARRIS

By

*Clarence A. O'Brien*  
*and Harvey B. Jacobson*  
Attorneys

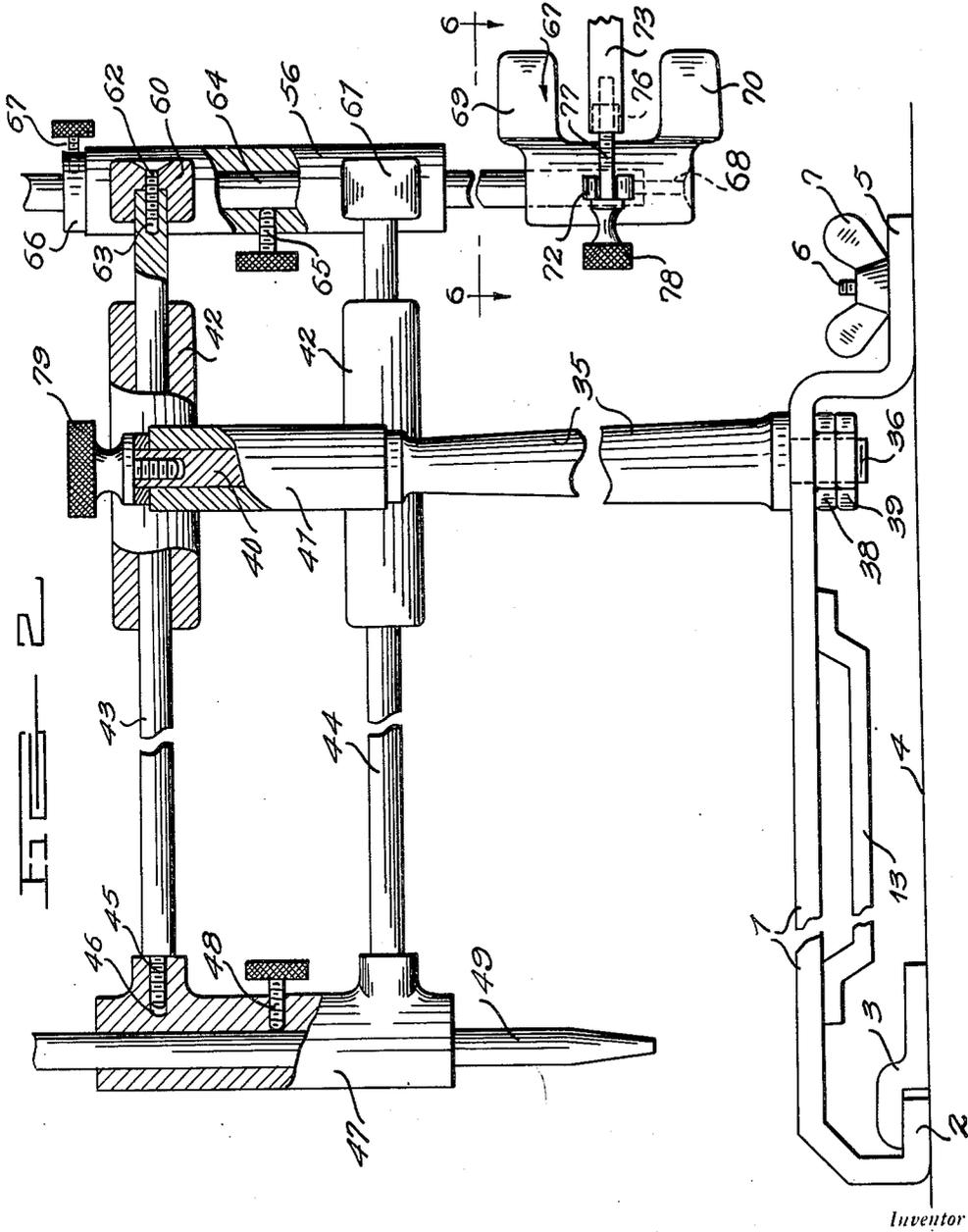
Oct. 31, 1950

E. C. HARRIS  
DENTAL SURVEYOR

2,528,053

Filed June 27, 1946

3 Sheets-Sheet 2



Inventor

ELMER C. HARRIS

By *Clarence A. O'Brien*  
*and Harvey B. Jacobson*  
Attorneys

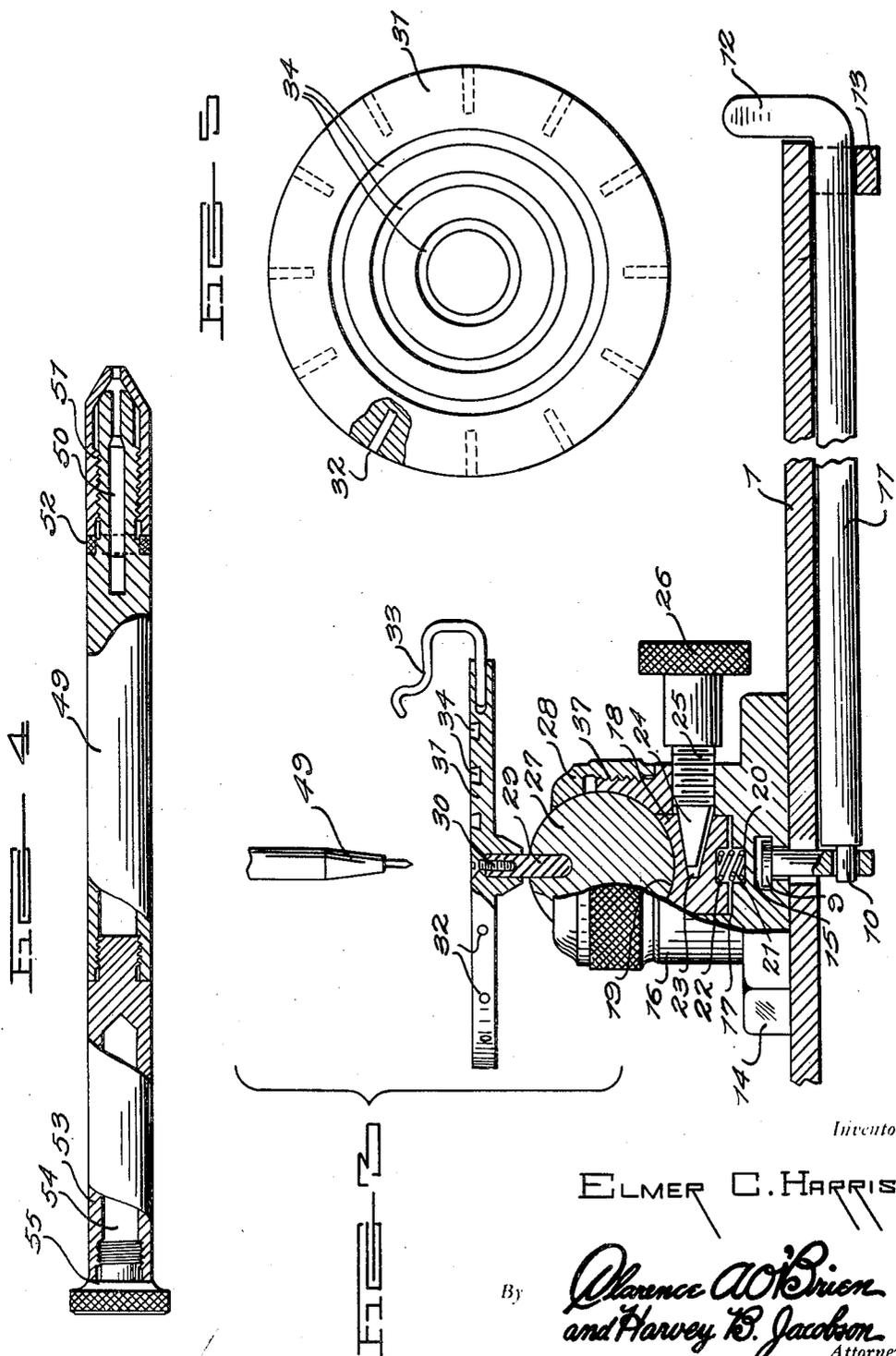
Oct. 31, 1950

E. C. HARRIS  
DENTAL SURVEYOR

2,528,053

Filed June 27, 1946

3 Sheets-Sheet 3



Inventor

ELMER C. HARRIS

By

*Clarence A. O'Brien*  
*and Harvey B. Jacobson*  
Attorneys

# UNITED STATES PATENT OFFICE

2,528,053

## DENTAL SURVEYOR

Elmer C. Harris, Hayward, Calif.

Application June 27, 1946, Serial No. 679,691

2 Claims. (Cl. 32-1)

1

This invention relates to improvements in dental surveyors.

An object of the invention is to provide an improved dental surveyor which is used for the purpose of laying out dentures and surgery on molds made from the mouth.

Another object of the invention is to provide an improved dental surveyor which will be suitably supported upon a table or work bench in spaced relation with the top thereof, said dental surveyor being formed with a base plate suitably apertured or slotted to adjustably support a work table upon which the denture or mold will be held in fixed position while the movable head supported on the fixed column secured to the base plate is properly adjusted to bring either the pencil or the dental hand piece bracket supported at the end of the parallel rods which extend through the movable head into position directly over the mold or denture.

A further object of the invention is to provide an improved dental surveyor for laying out and working on molds and dentures which will include a mold or denture supporting table which may be moved to any desired angle and locked in position while the actual work and laying out operation is being performed.

Another object of the invention is to provide an improved dental surveyor which will be highly efficient in operation, and relatively inexpensive to manufacture and produce.

Other objects will appear as the description proceeds.

In the accompanying drawings which form a part of this application,

Figure 1 is a perspective view of the improved dental surveyor;

Figure 2 is a side elevation of the improved dental surveyor being partly broken away and in section to show the interior construction thereof;

Figure 3 is an exploded view, partly in section of the work supporting table and the means for holding and locking the same in fixed position, together with the lay-out pencil disposed above the same;

Figure 4 is a side elevation of the pencil, the same being partly broken away and in section to show the interior construction thereof;

Figure 5 is a plan view of the improved work supporting table, a portion thereof being broken away and in section to show the radially extending sockets in which the molding clips are supported, and

Figure 6 is a view taken on the line 6-6 of Figure 2.

2

Like characters of reference are used throughout the following specification and the accompanying drawings to designate corresponding parts.

In carrying out the invention, there is provided a substantially rectangular shaped base member 1, which is provided with the spaced depending supporting feet 2 at its forward end which are adapted to be engaged by the clips 3 suitably secured to the table or work bench 4, said base member being also provided at its opposite end with the depending rearwardly extending supporting feet 5 which are suitably apertured to receive the attaching bolts 6 and wing nut or nuts 7 for securely attaching the said base member in spaced relation with the top of the table or work bench 4.

A longitudinally extending slot 8 is formed through the base member 1 approximately centrally thereof, and is adapted to support the T-shaped attaching stud 9 for movement along said slot to lock the work supporting table hereinafter described in the desired fixed position. The lower end of the T-shaped attaching stud 9 is transversely apertured to receive the reduced end 10 of the eccentric or cam rod 11 which extends outwardly immediately below the said base member and beyond the lateral limits thereof, and terminates in the upwardly extending finger gripping portion 12. The bearing or guide strip 13 is secured to the under surface of said base member 1 at its edge and in spaced relation thereto, forming a bearing for the outer end of said eccentric or cam rod 11. Obviously, when the cam rod is rotated in one direction the cam surface will engage the under surface of the base member 1 to pull downwardly on the T-shaped attaching stud, and when the said eccentric or cam rod 11 is turned in the opposite direction, the T-shaped attaching stud 9 will be released or moved upwardly.

The work supporting table assembly comprises the base or support 14, which is formed with the T-shaped slot 15 in its lower surface in which the head of the T-shaped attaching stud 9 is adapted to be received, as clearly illustrated in Figure 3 of the drawings. The base or support 14 is formed with an upwardly extending shank portion 16, which is reduced at its upper end, and is externally threaded as at 17. A centrally disposed vertical bore 17 is formed in the shank portion 16 of the base 14, and supports the piston 18 formed with the arcuate seat 19 on its upper end for vertical movement therein. A reduced axial bore 20 is formed in the base of the vertical bore 17 and supports the coil spring 21,

whose upper end is received within the oppositely disposed bore 22 in the lower end of said piston 18. An inwardly extending wedge-shaped slot or socket 23 is formed through one side of the piston 18 and is adapted to receive the wedge-shaped head 24 on the inner end of the screw 25 upon the outer end of which the enlarged knurled operating head 26 is secured.

A ball 27 is received within the upper end of the shank portion 16 of the base 14 upon the arcuate seat 19, and is held thereon for adjustment by means of the internally threaded cap member 28 which is threaded upon the reduced threaded upper end 37 of the shank portion 16. A pin 29 is secured in the ball 27 and is formed with a threaded bore in its upper end which is adapted to receive the locking screw 30 which will extend through the work supporting table 31 to hold the same in position upon said pin 29. It will therefore be seen that the table 31 may be moved into any desired position due to the ball and socket connection with the base or support 14, and may be clamped in the desired position by turning in on the operating head 26 to force the wedge-shaped head into the wedge-shaped slot or socket 23 in the shank 16. When the operating head 26 is unscrewed, the tension of the coil spring 21 will exert sufficient pressure upon the piston 18 to hold the ball 27 in the desired position until the operating head 26 may be tightened down.

The work supporting table 31 will be provided with a plurality of inwardly extending radial bores 32 into which the hook-shaped mold or denture clamping hooks 33 may be positioned to support the denture while the wax securing the denture or mold is hardening within the dovetail grooves arranged in circular and concentric arrangement in the upper surface of said table 31. The circular dovetailed grooves 34 may be made of any desired size as to cross section and in any preferred number. The wax will tend to flow into the grooves and will be thus anchored on the table.

A column 35 will be supported upon the rear end of the base member 1 and will be formed with a reduced depending screw shank 36 which will extend through a suitable aperture through said base member 1, and will be firmly attached thereto by means of the nuts 38 and 39 forming a lock therefor. The upper end of the column 35 will be reduced as at 40 and will support the movable head member 41, which is centrally apertured to slidably engage and seat over the said reduced upper end portion of the column, and is provided with the oppositely disposed horizontally extending spaced supporting guides 42, through which the parallel rods 43 and 44 are adapted to be positioned for adjustment. The guides 42 will ordinarily be welded to the member 41 and the parallel rods 43 and 44 are frictionally mounted within the sleeve-like guides 42. The adjacent ends of the rods 43 and 44 are formed with the threaded reduced extensions 45, the same being receivable within the threaded bores 46 in the pencil holding head 47. An adjusting or clamping screw 48 having an enlarged knurled head will be positioned through the pencil holding head 47 and will engage the pencil 49 when in position within said head to hold the same in the desired vertical adjustment.

The pencil 49 will include a lead supporting chamber 50 in its forward end for supporting rectangular shaped lead, and a threaded chuck 51 will be secured upon the lower end of the pencil for clamping the lead in place therein. A knurled 75

ring 52 will be provided at the forward or lower end of the pencil for operating the lead holding chuck. An extension 53 will be threaded into the upper end of the pencil 49, and will be provided with a central bore 54 in which lead may be stored, and will be closed by means of the threaded cap closure member 55.

A second head member 56 formed similarly to the pencil holding head 47 will be provided with the spaced lateral extending lugs 60 and 61 which are apertured to receive the locking screws 62 which are adapted to be received within the internally threaded bores 63 in the adjacent ends of the rods 43 and 44. The rod 64 is adapted to extend in a vertical position through the head 56, and to be held in the desired vertical adjustment by means of the locking screw 65 which extends through the head 56 to contact the outer surface of said rod 64. A collar 66 is supported upon the upper end of the rod 64 by means of the set screw 67, and serves to limit the degree or amount of downward movement which is to be made by the said rod and the dental hand piece bracket 67 which is supported upon the lower end thereof.

The dental hand piece bracket 67 is attached to the lower end of the rod 64 by means of the screw 68 extending through said bracket and up into the lower end of said rod. The bracket 67 is provided with the spaced laterally extending V-shaped arms 69 and 70 in which a dental hand piece or chuck for grinding or drilling molds or dentures (not shown) may be supported. The oppositely disposed ears 71 and 72 are formed on the bracket 67 midway of the spaced V-shaped arms, and the ear 71 supports the band piece 73 upon the pivoted pin 74, while the opposite end of the said band piece 73 is looped as at 75 to be engaged by the nut 76 on the inner end of the screw 77 which is threaded through the ear 72, and which supports the knurled operating head 78 on its outer end, to provide a rigid clamping means for clamping the said dental hand piece or chuck when used for grinding or drilling the mold dentures.

It will be obvious that when the mold or denture is secured upon the table 31, that either the pencil used for laying out the work, or the dental hand piece bracket may be swung around into position to overlie the work. A locking screw 79 will be disposed in the upper end of the reduced portion of the column 35 to hold the several mechanisms in rigid and adjusted position.

From the foregoing description, it will be apparent that there has been devised and provided a highly efficient form of dental surveyor, which may be used to meet all the requirements of good technique when laying out or making dental molds and dentures.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A work holder comprising a work supporting table, a base with a vertical bore therein, a piston in said bore and carrying said table on its upper end, stop means to limit the upward movement of said piston, a spring normally biasing said piston upwardly, said piston having a slot with an inclined face, and a set screw radially mounted on said base and having one end engaging said inclined face so that the piston may be forced upwardly against said stop means by turning said set screw in one direction.

2. A work holder comprising a work supporting

5

table, a base with a vertical bore therein, a piston in said bore and carrying said table on its upper end, stop means to limit the upward movement of said piston, a spring normally biasing said piston upwardly, said piston having a slot with an inclined face, and a set screw radially mounted on said base and having one end engaging said inclined face so that the piston may be forced upwardly against said stop means by turning said set screw in one direction, said stop means comprising a collar vertically adjustably mounted on said base and having a portion engageable with the top of said piston.

ELMER C. HARRIS.

## REFERENCES CITED

The following references are of record in the file of this patent:

|    | Number    |
|----|-----------|
|    | 733,321   |
|    | 798,934   |
| 5  | 1,292,121 |
|    | 1,400,028 |
|    | 1,526,619 |
|    | 1,575,983 |
| 10 | 2,434,829 |
|    |           |
| 15 |           |

6

## UNITED STATES PATENTS

| Name           | Date          |
|----------------|---------------|
| Griswald ----- | July 7, 1903  |
| Vuithier ----- | Sept. 5, 1905 |
| Stead -----    | Jan. 21, 1919 |
| Cohen -----    | Dec. 13, 1921 |
| Williams ----- | Feb. 17, 1925 |
| Fish -----     | Mar. 9, 1926  |
| Bentzman ----- | Jan. 20, 1948 |

## FOREIGN PATENTS

| Number  | Country       | Date          |
|---------|---------------|---------------|
| 73,953  | Germany ----- | Mar. 17, 1894 |
| 680,764 | Germany ----- | Sept. 7, 1939 |