

[54] **HOLDER FOR DENTAL HANDPIECE**

[72] Inventor: **Dwight Allan Booth**, Portland, Oreg.

[73] Assignee: **Omark Air Controls, Inc.**, Portland, Oreg.

[22] Filed: **Feb. 16, 1970**

[21] Appl. No.: **11,532**

[52] U.S. Cl. **32/22**

[51] Int. Cl. **A61c 19/02**

[58] Field of Search **251/89, 90, 113; 32/22**

[56] **References Cited**

UNITED STATES PATENTS

1,552,323 9/1925 Lehman.....32/22

3,514,171 5/1970 McGaha 32/22
1,027,061 5/1912 Norling.....251/113 X

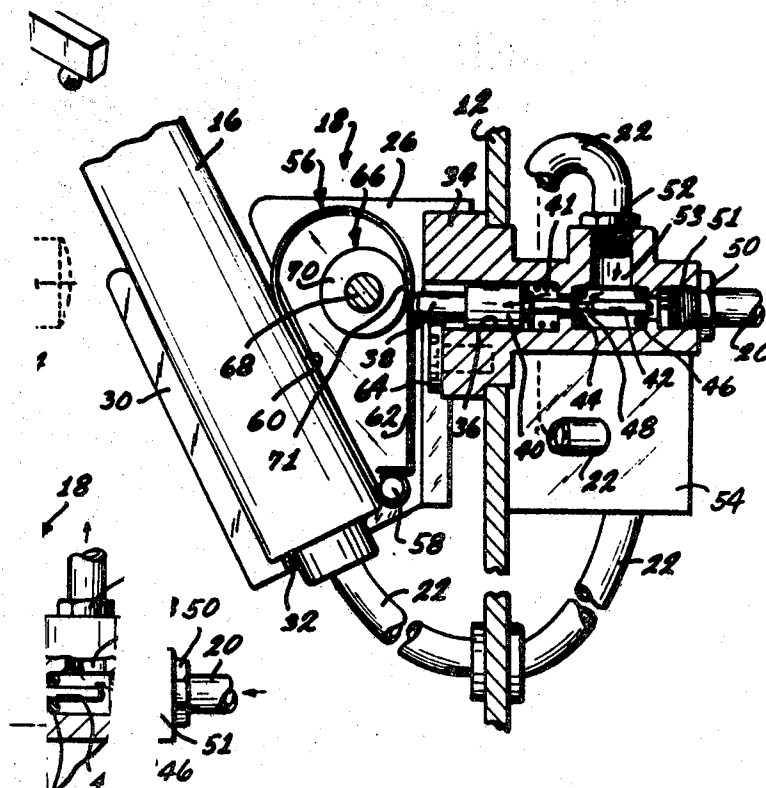
Primary Examiner—Robert Peshock
Attorney—Robert L. Harrington

[57]

ABSTRACT

A stationary holder has a spring that is depressed by a dental handpiece placed in the holder to shut off the air supply to the handpiece. A manual shut off depressed the spring to shut off the air supply as desired with the handpiece removed from the holder.

3 Claims, 4 Drawing Figures



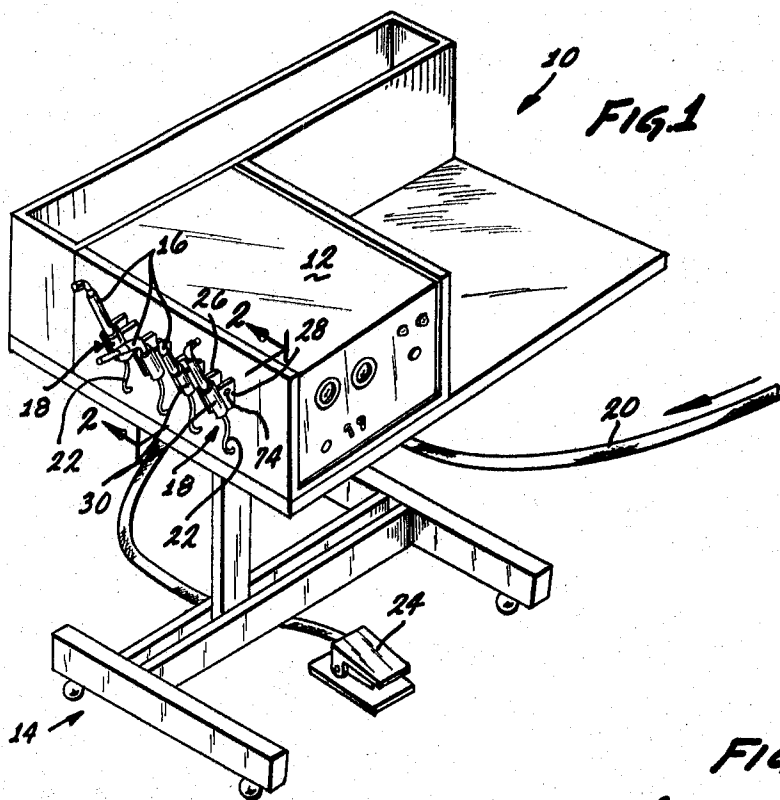


FIG. 1

FIG. 4

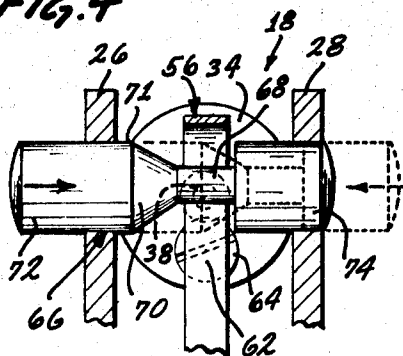
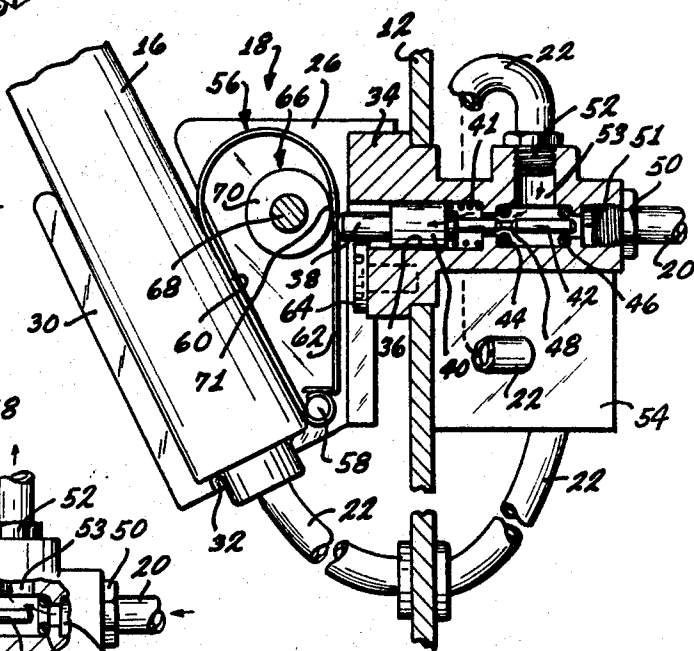


FIG. 2



INVENTOR
DWIGHT A. BOOTH

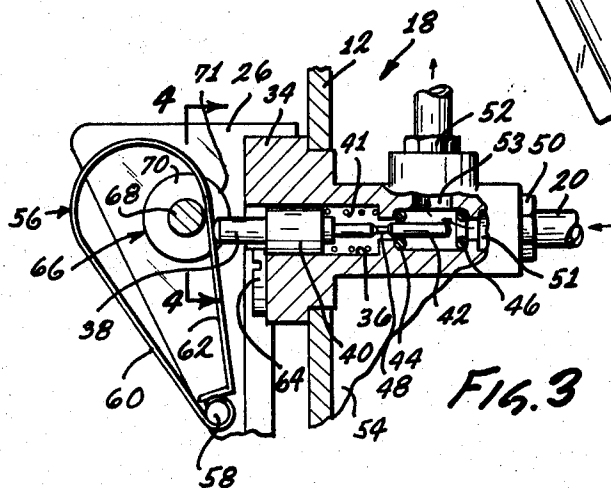


FIG. 3

BY ROBERT L. HARRINGTON
ATTORNEY

HOLDER FOR DENTAL HANDPIECE

HISTORY

This invention relates to a holder for a dental handpiece and more particularly to the means for shutting off the air supply to a dental handpiece when the handpiece is placed in the holder.

Dental handpieces such as contemplated by this invention are driven by air supplied from a central air supply. A single dental unit will include several handpieces to accommodate the various drilling requirements. These handpieces are all driven by a central air supply. Thus it will be understood that while one handpiece is being used the air supply to the handpieces must be shut off. It has been found that the shut off is preferably located on the handpiece holder where placement of the handpiece automatically shuts off air supply to that handpiece.

Heretofore the holder was mounted on a swivel which was biased upwardly and in such position opened the valve for permitting air to the handpiece. When placed on the holder, the weight of the handpiece forced the swivel in its lower position to shut off the air supply. While effective as an automatic shut off, the moving holder has proven to be inconvenient. Removal or placement of the handpiece is found to be awkward, a very undesirable feature for a dentist involved in the treatment of a patient.

The present invention is believed to provide a substantial improvement over such prior holders. The holder is stationary so as to be an easy target for the dentist. The spring operated shut off provides for variance in the handpiece size, is reliable, provides easy means for manual shut off, inexpensive to construct and easy to repair. Other advantages will be apparent by reference to the following detailed description and drawings wherein:

FIG. 1 illustrates a dental unit with dental handpiece holders embodying the present invention;

FIG. 2 is a section view of one of the holders taken along lines 2—2 of FIG. 1;

FIG. 3 is a section view similar to FIG. 2 showing the handpiece removed from the holder; and

FIG. 4 is a view taken on section line 4—4 of FIG. 3.

Referring to FIG. 1 of the drawing a dental unit is illustrated which includes a control unit 12 supported on a base 14. Dental handpieces 16 are shown placed in holders 18 mounted to the control unit 12. The dental handpieces are powered by air pressure through a main air line 20 which connects through a valve system (described in detail hereafter) to individual air lines 22. A foot control 24 varies the air pressure to the dental handpieces to vary the speed at which the tool carried by the handpiece is being rotated, e.g. a dental drill. The tool holder 18 is shown more clearly in FIGS. 2 through 4. Bracket members 26 and 28 mount a tool cup 30 to the side wall of the control unit 12. As shown in FIG. 2, a shoulder portion 32 on the bottom of the tool cup 30 supports the handpiece in the cup without interference with air line 22. The air line 22 passes through an opening in the wall of the control unit 12 and is connected to valve housing 34 by connection 52. It will be understood that the air line 22 has a length sufficient to permit use of the dental handpiece on a patient located in an adjacent dental chair. In the illustration the air line is shown in a retracted position as provided by any well known retraction apparatus schematically illustrated in FIG. 2 as a box 54.

The valve housing 34 is provided with a valve bore 36 and a valve piston 40 slidably mounted therein. A coil spring 41 urges the piston toward the tool cup 30. A piston stop 64 limits the movement of the piston in the direction of the tool cup 30. A reduced nose portion 38 protrudes out of the valve bore 36 and is engaged by a switching lever 56. The opposite end of the valve piston 40 carries a valve stem 42 having a relief 48. The air supply 20 is connected to the valve housing by connector 50 with an air passage 51. A seal 46 in the air passage 51 is adapted to be engaged by the valve stem 42 to shut off air

from the air supply 20. With the valve stem retracted as shown in FIG. 3, the valve stem engages seal 44 in the valve bore 36 with air from the air supply line 20 interconnected with air line 22 through air passage 53. With the valve stem sealing the main air supply, air from air line 22 is drained past the relief 44.

The switching lever 56 is comprised of a bowed leaf spring connected to pivot 58. The inner wall 62 of the switching lever 56 engages the pusher end 38 of the valves. The outer wall 60 of the switch protrudes into the tool cup 30. Thus it will be seen from FIG. 3 that with the handpiece 16 removed from the holder, the coil spring 41 urges the piston 40 against the switching lever 56 forcing it into the tool cup 30. In this position the draining passage at seal 44 is closed and the passage through seal 46 is opened. Thus the handpiece is connected to the air supply and foot lever 24 is operative to control the rotation of the drill. With the handpiece placed on the holder as shown in FIG. 2, the switching lever is forced out of the tool cup 30 thereby closing the opening at seal 46 and opening the drain passage. The air supply 20 is then diverted to another of the handpieces removed from its holder.

FIG. 4 illustrates a manual shut-off which is desirable for example where a dentist is using one handpiece and a second one is removed from its holder by an assistant for changing drill bits. Means must be provided to shut off air from the main air supply line 20 to the second handpiece. The hand operated air control unit 66 shown in FIG. 4 comprises a plunger adapted for sliding movement through openings in the brackets 26 and 28. The plunger has a portion of reduced diameter 68 with a tapered portion 70. With the plunger moved to the left as viewed in FIG. 4, e.g. by pushing end 74 flush up against bracket 28, the reduced portion is aligned with the bowed switching lever 56 to provide clearance for normal on-off operation thereof. By forcing the plunger to the right, e.g. by pushing end 72 flush against bracket 26 as shown in dotted lines, the tapered portion of the plunger engages the switching lever 56 and forces it out of the tool cup to shut off the air supply as previously described.

Modifications of the above disclosed embodiment of the invention will be apparent to those skilled in the art. The example given is not intended to limit the invention but to disclose a preferred embodiment. The claims appended hereto thus will determine the full scope of the invention.

What is claimed is:

1. Apparatus for holding a dental handpiece comprising a control unit, a tool holder mounted to the control unit to remain stationary with respect to the control unit, a valve including a valve bore in the control unit, a valve stem including a piston adapted to fit the valve bore, said valve stem being slidable in said valve bore and having a first position opening the air supply to the handpiece and a second position closing the air supply to the handpiece for controlling the air supply to the dental handpiece, an on-off switch comprising a bowed leaf spring switching lever having an outer wall portion protruding into the tool holder and an inner wall portion, said switching lever being pivotally mounted to the tool holder for pivotal movement in response to placement of the dental handpiece in the stationary tool holder from a first position with the outer wall portion protruding into the tool holder to a second position forcing the valve stem to said second position, said valve stem further including a valve pusher portion reduced in diameter from the piston protruding out of the valve here for engagement with the inner wall portion of said switching lever, and biasing means biasing the valve stem to said first position, whereby said on-off switch is activated by placement of the dental handpiece in the stationary tool holder.

2. Apparatus for holding a dental handpiece comprising a control unit, a tool holder mounted to the control unit to remain stationary with respect to the control unit, a valve in the control unit controlling the air supply to the dental handpiece, an on-off switch for the valve that is activated by placement of the dental handpiece in the stationary tool holder,

3

means to manually activate the on-off switch with the handpiece removed from the tool holder, wherein a pair of brackets mount the tool holder to the control unit, a bowed leaf spring switching lever pivotally mounted between the brackets, said bowed leaf spring switching lever having an outer wall portion protruding into the tool holder and an inner wall portion engaging the valve, said means to manually activate the on-off switch including a plunger mounted for sliding movement between the brackets, said plunger having a large diameter portion, a small diameter portion and a tapered portion there between, and means for sliding the plunger in a first position whereby the small portion is aligned with the switching lever with sufficient clearance to permit normal operation thereof, and in a second position whereby the larger portion engages the switching lever to hold the switching lever in off position.

3. A dental unit comprising a control unit, a valve having a valve housing carried by said control unit, a plurality of air drive dental handpieces having individual air supply lines connected to said valve housing, a valve bore in said valve housing for each individual air supply line, a main air supply line connected to said valve housing, air passage means for such valve

4

housing interconnecting the main air supply line to the valve bore of each of said individual air supply lines, a valve stem adapted for sliding movement within each valve bore and having a first position opening the air passage to the individual air supply line and a second position closing the passage to the individual air supply line, a handpiece holder for each dental handpiece mounted to the control unit to remain stationary with respect to the control unit, a switching lever comprising a bowed leaf spring mounted to each holder and adapted to engage the respective valve stem, said switching lever being activated by placement of the handpiece in the holder for positioning the valve stem to a second position whereby only the handpiece removed from its holder is interconnected with the air supply, a pair of brackets mounting the tool cup to the control unit, and a manually operated control member including a plunger slidably mounted between the brackets, said plunger having a large and small cross section portion, means for moving the plunger for selective positioning of the large and small cross sectional portions into alignment with the switching lever.

* * * * *

25

30

35

40

45

50

55

60

65

70

75