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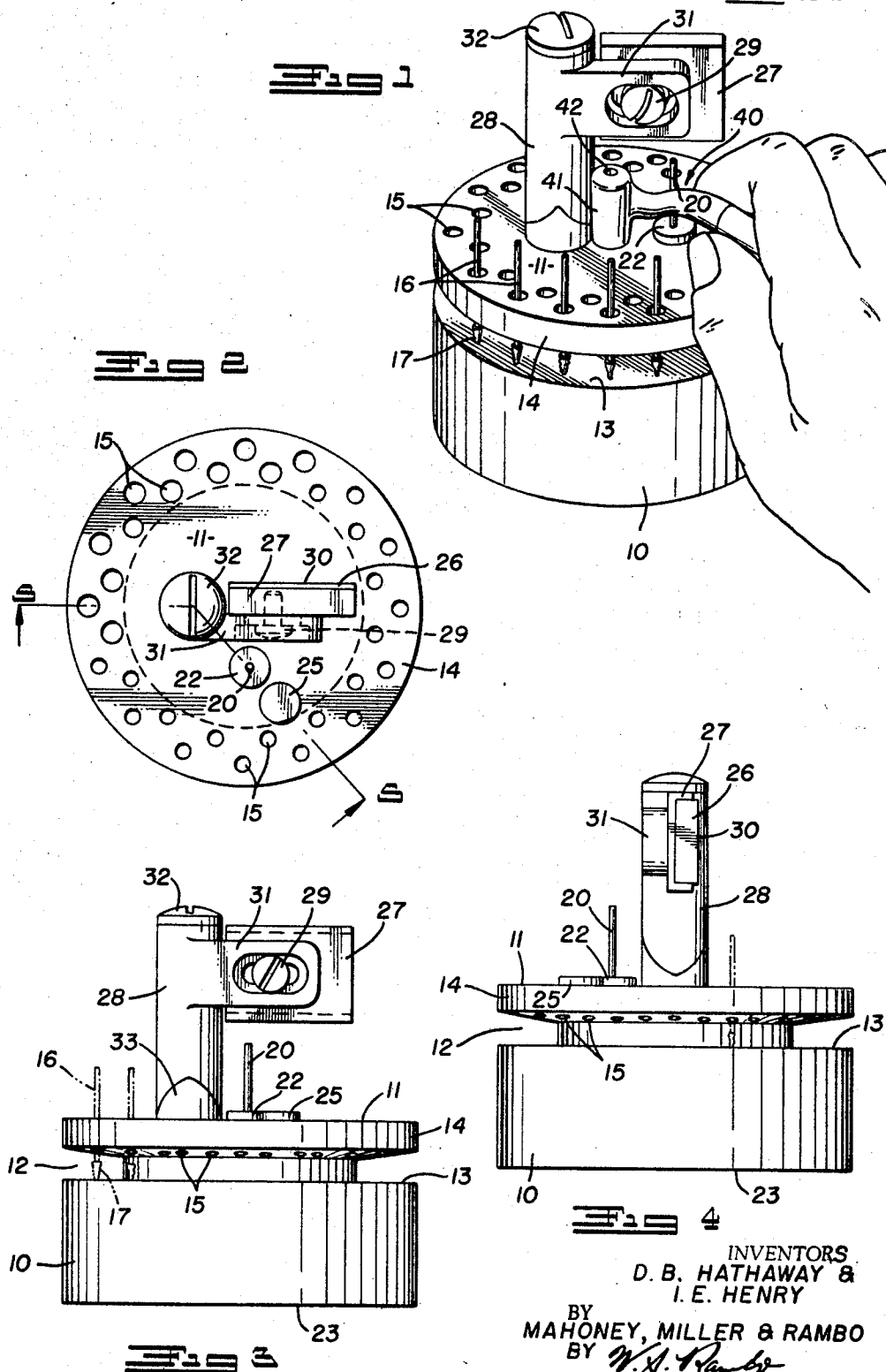
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3,451,133

DISPENSING HOLDER FOR DENTAL BURS

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Sheet 1 of 2



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Sheet 2 of 2

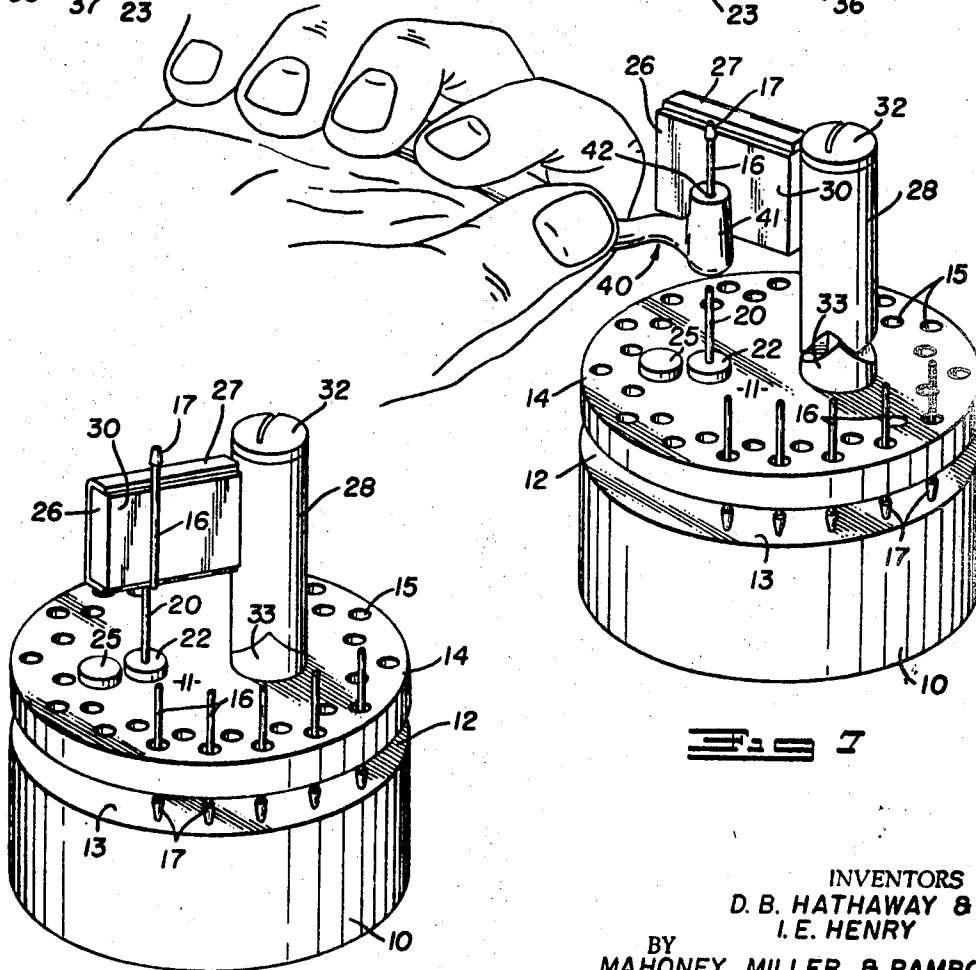
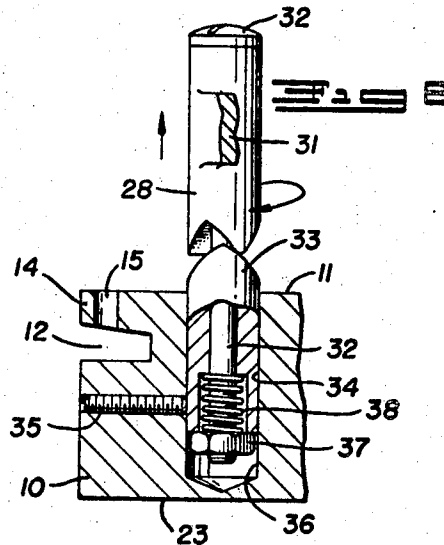
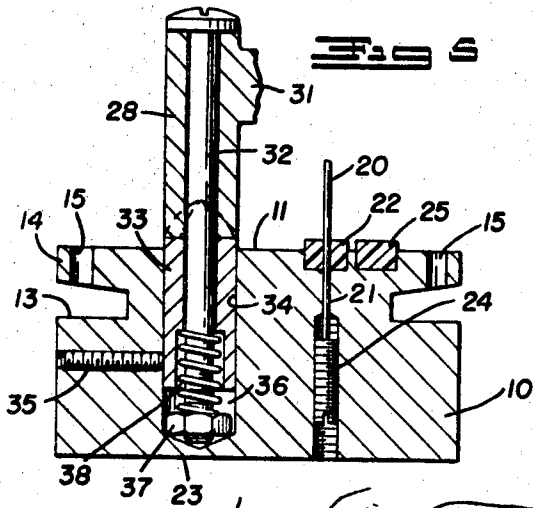


Fig. 7

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DISPENSING HOLDER FOR DENTAL BURS

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5 Claims

ABSTRACT OF THE DISCLOSURE

A dispensing holder for dental burs and similar drill-rotated instruments providing means for facilitating the insertion and extraction of such instruments in and from the driving chuck of a dental handpiece by a one hand operation, and for collecting and retaining used instruments separate and apart from unused, sterile instruments.

Background of the invention

This invention relates to a dispensing holder for dental drill bits, burs and similar drill-rotated instruments. It has to do, more particularly, with a holder for receiving and holding the working instruments ordinarily employed by a dentist in the drilling, cutting or polishing of teeth, and for facilitating the selection, insertion, and ejection of such instruments in and from the handpiece of a power driven dental drill.

It is customary for a dentist to use an air turbine handpiece which carries a rotary friction chuck in which the stem or shank portions of various sizes and shapes of bits, burs and similar instruments are inserted. At present, it is necessary to use both hands in loading and unloading the chuck and to engage the selected instrument with the fingers to push it into the chuck and pull it out of the chuck. Thus, where a number of different instruments are used on a given patient, a large amount of the dentist's time is spent in interchanging burs and other instruments in the dental handpiece.

Objects and general description of invention

It is the main object of this invention to provide a holder for dental burs and related rotary working instruments which functions to hold the instruments in positions where they are readily visible for selection and from which they may be easily and quickly inserted in the handpiece without requiring the use of two hands, and which provides means for ejecting a used instrument from the handpiece to permit rapid interchange of different instruments.

It is another object of this invention to provide a dispensing holder for dental burs and the like which may be easily sterilized and maintained in a sterile condition preparatory to its actual use.

In the accompanying drawings, there is illustrated a preferred embodiment of the device of this invention and in these drawings:

FIGURE 1 is a perspective view of the holder and indicating how it is used in loading the chuck of the handpiece.

FIGURE 2 is a plan view of the holder.

FIGURE 3 is a side elevational view of the holder.

FIGURE 4 is a view similar to FIGURE 3 but taken at 90° relative to FIGURE 3.

FIGURE 5 is a vertical sectional view taken along line 5—5 of FIGURE 2.

FIGURE 6 is a view similar to FIGURE 5 but showing different positions of parts.

FIGURE 7 is a perspective view of the holder and indicating how it is used in the unlodaing of the chuck of the handpiece.

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FIGURE 8 is a perspective view similar to FIGURE 7 and showing how the removed instrument is retained.

With reference to the drawings, the holder of this invention is made completely of materials which are subject to sterilization by autoclave, boiling or cold solution. It is preferably made mainly of stainless steel but includes a few parts composed of a plastic material which can be sterilized by any one of the aforementioned procedures. When not actually in use, the entire device loaded with sterile burs and similar instruments may be covered by a heavy glass or plastic bell (not shown) to maintain sterility.

The device comprises a heavy cylindrical base 10 which will rest on a suitable bracket table or other surface, and, due to its weight, will not tend to move about thereon. It is provided with a flat top surface 11 and spaced slightly below this surface, the base is provided with an annular outwardly opening, peripheral groove 12 formed therein. This produces an instrument-supporting flat shelf or ledge 13 parallel to and below the top surface 11 and an annular upper socket containing flange 14. This flange is provided with sockets 15 extending vertically completely therethrough which may be of various sizes and variously arranged in the flange to receive the various working instruments. These instruments may be of various different types, but are here shown as comprising dental burs or diamond points 16 each having an elongated shank portion and a working tip 17. As will be understood, the instruments may be of various shapes and types used in dental handpieces. They are inserted in the sockets 15 with their tips 17 downwardly, resting on the shelf surface 13, and with their shanks upstanding above the upper flat surface 11. With the instruments 16 supported in this upright position, the tips 17 can be readily viewed through the groove 12 for purpose of selecting the correct instrument for a particular operation.

In addition to means for removably supporting the instruments 16, the holder is provided with means for removing or extracting a used instrument from the handpiece. This latter means comprises a push-out pin 20 which projects upwardly from the upper flat surface 11 of the base 10. This pin 20 is supported for vertical adjustment in the manner illustrated best in FIGURE 5. It is mounted for vertical sliding movement in a bore 21 in the base and has a cushioning collar 22 disposed around it and seated in an annular recess in the upper surface 11. In alignment with the bore 21 is a tapped bore which extends to the flat lower surface 23 of the base 10. This upwardly opening bore receives a threaded adjusting pin 24 which extends upwardly and engages the lower end of the pin 20. By adjusting the screw 24, the pin 20 may be moved axially up and down in the collar 22 to project more or less above the surface 11. The collar 22 will project above the surface 11 to provide a cushion for engagement with the lower end of the chuck as will later appear. This collar may be of nylon or other suitable yieldable plastic. Adjacent to and radially outwardly of the cushioning collar 22, is a button 25 of similar cushioning material which is mounted in a recess in the flat surface 11 and projects upwardly thereabove. The cushioning elements 22 and 25 can be removed for sterilization and replaced when worn.

For automatically retaining each instrument 16 when it is pushed out of the chuck by the pin 20, in the manner to be described later, an arrangement is provided which may be termed a magnetic flag-type retainer. This retainer comprises a permanent magnet 26 which is mounted in a channel member 27 supported in a radially outwardly extending position on the upper end of a post section 28 which is supported off-center on the base 10 with its axis

in perpendicular relationship to the fiat surface 11 thereof. The magnet 26 presents a flat, vertical surface 30 which, in the normal position of the post section 28, is in a plane parallel to, but laterally offset from the upstanding push-out pin 20, as shown in FIGURES 2 and 4. The magnet-receiving channel member 27 is mounted for radial adjustment by means of a slot and screw connection 29 (FIGURE 1) on an arm 31 which is integral with the post section 28 and extends radially outwardly therefrom.

The post section 28 is in the form of a sleeve which is rotatably mounted on the upper portion of a vertically disposed bolt 32, as shown best in FIGURES 5 and 6. This bolt is mounted for vertical axial movement in a post socket sleeve 33 which is normally fixed in an upwardly opening socket 34 formed in the base 10. The member 33 is held in adjusted vertical position in the socket 34, with its upper end projecting above the fiat surface 11, by means of a set-screw 35 engaging therewith and which extends radially inwardly from the periphery of the base 10 and is tapped in a bore therein. The bolt 32 extends downwardly through the sleeve 33, and it will be noted that there is a chamber 36 below the sleeve in which the nut 37, carried by the bolt 32, is disposed and is vertically movable. Between the nut 37 and the recessed lower end of the sleeve 33 is a compression spring 38 which surrounds the bolt 32. The adjacent ends of the post sections 28 and 33 are held in engagement by the spring 38, and these ends are formed with interengaging cam surfaces that cooperate to normally maintain the magnet 26 in the radial position shown in FIGURES 1 through 4.

As previously indicated, this holder is particularly useful in holding and removing burs or similar instruments of the type which are adapted to be detachably held and driven in rotation by the friction-type chuck of a dental handpiece. This handpiece is indicated by the numeral 40 in the drawings and the friction chuck 41 is indicated as being disposed on the outer end thereof. This friction chuck has the usual socket 42 extending completely there-through. The shank 16 of a selected bur may be pushed axially into the socket 42 at one end thereof and will be automatically, drivingly gripped by the friction chuck, the details of which are not important to this invention. To remove the instrument, it is merely necessary to insert a push-out pin from the opposite end of the socket 42 to push the shank of the bur outwardly from the chuck. Ordinarily, the insertion and/or removal of a bur from the chuck requires the use of both hands, one to hold the handpiece and the other to grasp and manipulate the bur and or a hand tool for pushing the bur into or out of the handpiece. This operation is somewhat tedious and requires handling of the instruments by the fingers which complicates the maintenance of hygienic conditions. However, these disadvantages are avoided with the present invention.

The entire holder can be fully loaded with instruments, sterilized, and maintained in a sterile bell-type enclosure until ready for use. Also, if desired for hygienic conditions, the magnet 26 may be covered with a disposable plastic sleeve or film (not shown). When it is desired to use the holder, the bell-type enclosure is removed therefrom. The dentist may now select a particular instrument 16 by visual reference to the working tip 17 thereof. He will then press the socket 42 of the chuck lightly over the upstanding shank of the selected instrument, as indicated in FIGURE 1, and remove the same from its socket 15. The selected drill bit or instrument is then fully seated in the chuck 41 by pressing the tip 17 of the instrument downwardly upon the plastic pad 25. As will be seen, the picking up and insertion of the selected instrument or bur 16 in the chuck 41 of the handpiece may be easily and rapidly accomplished by a one-hand operation.

When it is desired to remove the instrument from the chuck, the handpiece is first inverted, as indicated in FIGURE 7, and then moved laterally into engagement with the

face surface 30 of the magnet to swing the magnet and its flag retainer clockwise to a position in which the socket 42 of the chuck is disposed above and in axial alignment with the push-out pin 20. The chuck 41 may now be moved downwardly axially over the pin 20 to push the used instrument 16 upwardly out of the chuck socket 42. As the used instrument is pressed outwardly from the chuck of the handpiece, the instrument is magnetically attracted to and retained on the face 30 of the magnet. When the chuck 41 moves downwardly on the push-out pin 20 and clears the magnet 26, the post section 28 and its magnet-carrying flag will return to its original position under action of the spring 38 and the cooperation of the interengaging cam ends of the post sections 28 and 34. In this position of the magnet, the handpiece may be lifted off of the pin 20 ready to receive another instrument. Several burs or instruments 16 may be accumulated and retained on the magnet upon successive removal from the chuck 41. When the treatment of a particular patient is completed, the accumulated instruments may be removed from the magnet for sterilization. The plastic sleeve covering for the magnet 26 may be removed and replaced by a new one so as to insure against bacterial contamination of the magnet.

The post structure may be adjusted vertically by loosening and resetting the screw 35 depending upon the axial extent of the chuck 41. Similarly, the push-out pin 20 may be adjusted vertically by the set-screw 24. This push-out pin is preferably of lesser diameter than the shanks of the instruments 16 so that it will not be tightly gripped by the friction chuck 41.

It will be apparent that the structure described provides a convenient holder which will visibly hold the instruments for selection by the dentist. These instruments are supported with their shanks upright so that the dentist can use one hand in moving the chuck over the instrument and causing it to frictionally engage with the shank of the instrument. Furthermore, to release the instrument, it is merely necessary for the dentist to handle the handpiece with the one hand and invert the chuck to move it into cooperation with the push-out pin. At the same time that the instrument is pushed out from the chuck, it is automatically retained by the movable magnetic flag which is yieldably mounted for angular movement so that it will be properly associated with the chuck during the unloading operation.

Having thus described this invention, what is claimed is:

1. A dispensing holder for drill-rotated dental instruments having shanks adapted to be frictionally received in a drill chuck, said holder comprising a base having relatively spaced sockets for supporting a plurality of instruments with their shanks exposed in upright position; a push-out pin carried by and projecting upwardly from said base for ejecting an instrument from a dental drill chuck when said chuck is telescoped over and forced downwardly on said pin; and magnetic means supported by said base and movable in a generally horizontal plane above said push-out pin and operative to magnetically attract and retain said instrument when ejected by said push-out pin.

2. A dispensing holder according to claim 1 in which said base has an upper surface with said sockets opening upwardly therefrom, said push-out pin extending upwardly from said upper surface, and wherein said magnetic means comprises a post extending upwardly from said surface, a magnet retainer carried by and projecting laterally outwardly from said post above said push-out pin and arranged for swinging movement about the axis of said post, and wherein said base includes a peripheral groove disposed below said upper surface and communicating with the lower ends of said sockets, said groove providing a shelf on which instruments positioned in said sockets may be supported with their working ends visible.

3. A dispensing holder according to claim 2 in which said post comprises an upper rotatable section which car-

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ries said magnet retainer and a relatively fixed lower section connected to said base, the upper section of said post being axially movable relative to the lower section, said post sections having interengaging cam faces normally holding said magnet retainer in a predetermined angular position with respect to the axis of said post.

4. A dispensing holder according to claim 2 including means for adjusting said post vertically on said base and means for adjusting said pin vertically on said base.

5. A dispensing holder according to claim 3 including means mounting the magnet retainer on said upper post section for radial adjustment.

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