United States Patent [19]

Gayso

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[54] **VIBRATING DENTAL PACKER**

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[52] **U.S. Cl.** **32/53;** 128/36

[51] **Int. Cl.** **A61c 3/08**

[58] **Field of Search** ..... 32/56, 57, 58, 53, 54, 32/50, DIG. 4; 128/24 A, 32, 41, 51, 52, 424, 36; 310/17, 20, 81

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[57] **ABSTRACT**

A pencil-shaped hand piece is disclosed with one end connected by a flexible wire capable of conveying vibrations to an electric vibrator and with its other end incorporating a threaded aperture into which accessory tips can be mounted. The accessory tips can be in the form of a spatula or a compactor for depositing and/or compacting deposited material in a working area such as a dental mold with vibrations conveyed to the hand piece and the accessory tip first effecting the depositing and then the compacting of the material subsequent to the depositing of the material in the working area. The electric vibrator is adjustable to vary the intensity of the vibrations and is mounted in a casing including supporting means for holding a plurality of accessory tips as well as a supporting member for storing the hand piece when the device is not in operation.

9 Claims, 4 Drawing Figures

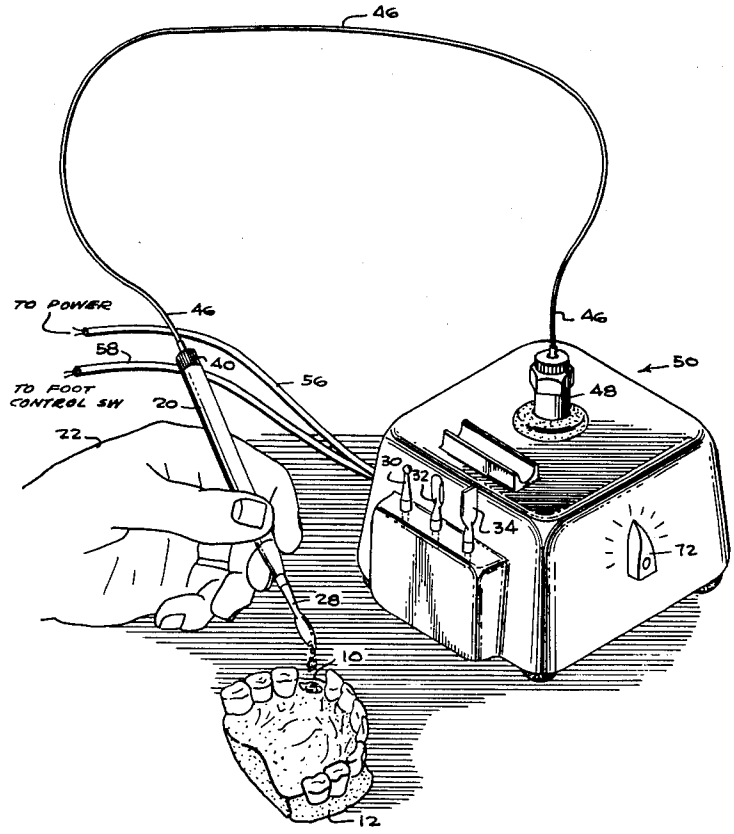
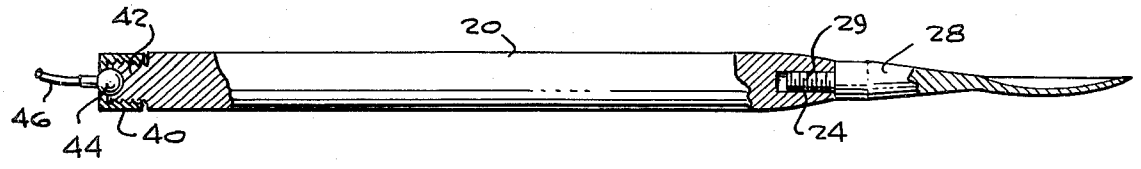


Fig-2


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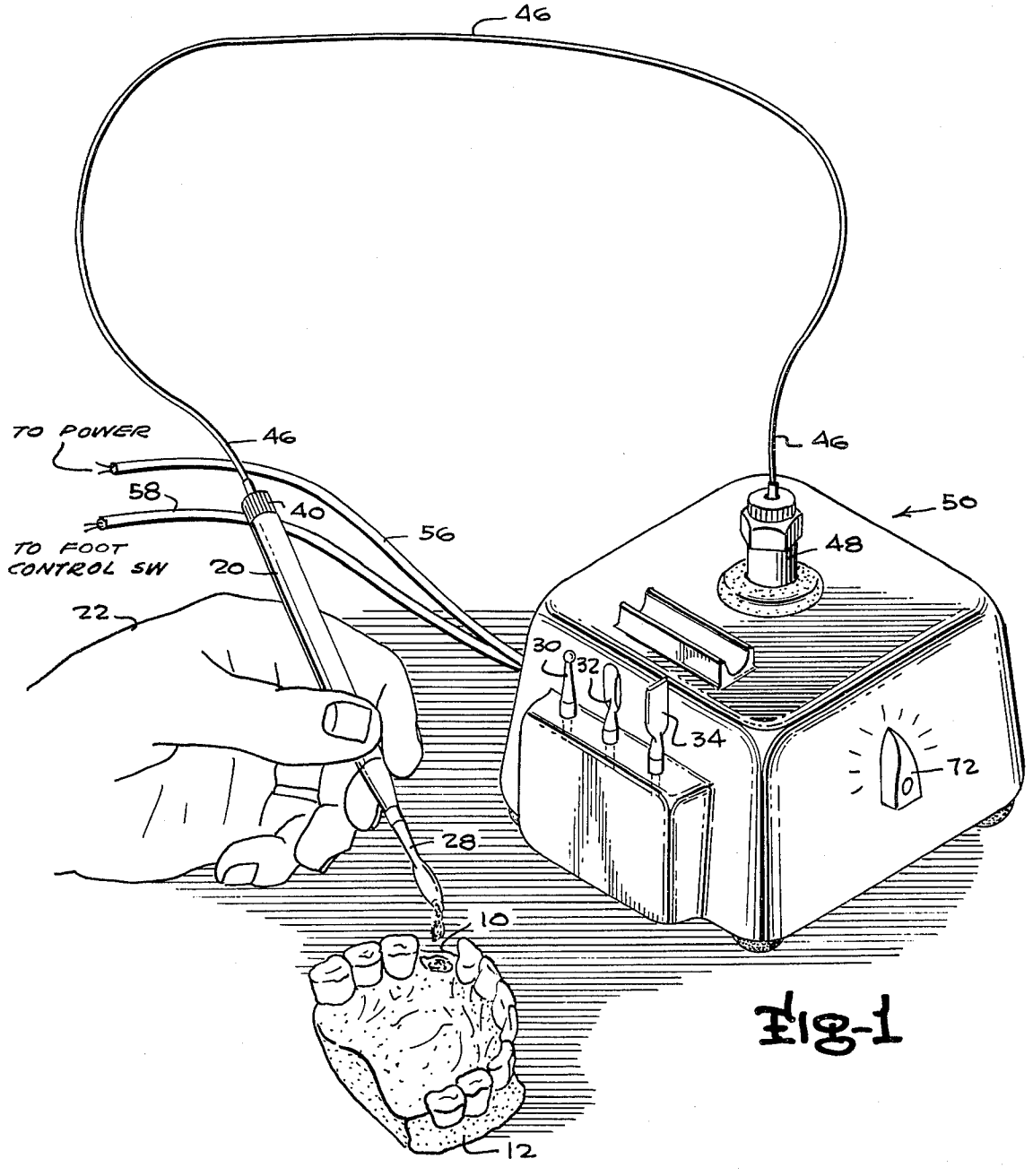

46
TO POWER
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TO FOOT CONTROL SW
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Fig-1

Fig-3

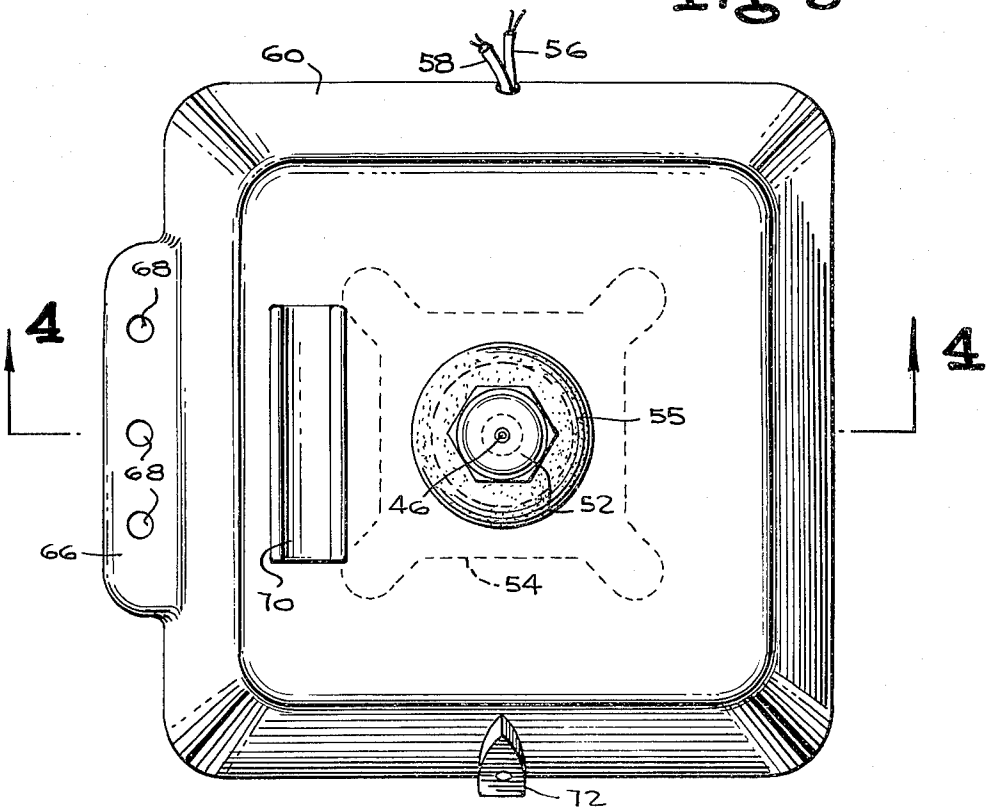
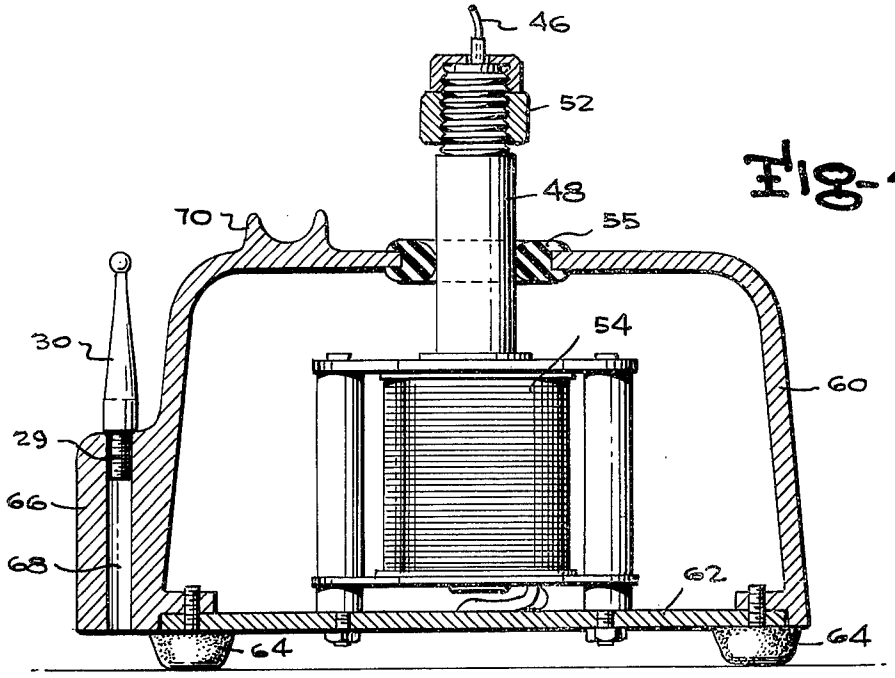

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Fig-4


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VIBRATING DENTAL PACKER

This invention is in the field of hand-held tools and is specifically directed to the field of dental tools for depositing either dry or damp powdery material such as porcelain or the like in a mold and for subsequently compacting the deposited material into the working area of the mold.

It is necessary in the formation of many dental appliances to deposit powdery material in either a wet or damp form in a working area such as a mold or impression followed by the compaction of the material after deposit in the working area. For example, powdery porcelain is frequently employed by dental technicians in the foregoing manner during the construction of false teeth, bridges or the like.

In the previously employed methods of depositing and compacting such powdery material, the hand of the technician would normally rest upon a vibrator from which vibrations would be conveyed to a hand-held applicator/compactor through the technician's hand. The foregoing method of operation is somewhat cumbersome and lacking in flexibility. Consequently, considerable time and expense is inherent in the prior known methods and apparatus used in constructing dental appliances.

Therefore, it is the object of this invention to provide a new and improved hand tool for applying and compacting powdery material in dental fabrications.

Another object of this invention is the provision of a new and improved vibrating means for use in effecting dental fabrications with the new and improved means being easy to use to provide uniform results.

Achievement of the objects of this invention is enabled through the preferred embodiment of the invention by the employment of an electric vibration source having a flexible wire like member extending to a hand piece. The hand piece is pencil shaped to be easily received in the hand of the user and is connected on one end to the vibration conveying spring wire member and on its other end is provided with a threaded aperture into which a selected accessory tip can be mounted. Since vibrations are conveyed directly through the rigid hand piece, the vibrations, which are relatively delicate, are uniformly conveyed to the accessory tip which is easily maneuverable to any orientation for enabling the achievement of uniform results.

A better understanding of the manner in which the preferred embodiment achieves the objects of this invention will be enabled when the following written description is read in conjunction with the appended drawings in which:

FIG. 1 is a perspective view of the preferred embodiment being employed in an actual working operation;

FIG. 2 is a side view of the hand piece of the preferred embodiment with portions in section to illustrate the inner construction of the hand piece;

FIG. 3 is a top plan view of the electric vibration source means; and

FIG. 4 is a sectional view taken along limes 4—4 of FIG. 3.

Attention is initially invited to FIG. 1 of the drawings which illustrates the preferred embodiment of the invention in operation in the formation of a dental appliance in the working area 10 of a mold 12.

As shown in FIG. 1, a pencil-shaped hand piece 20 formed of rigid material capable of conveying vibrations is dimensioned to be conveniently and easily held in the hand 22 of the user. Hand piece 20 is of solid rigid construction and is provided with a threaded aperture 24 on one end for receiving a selected accessory tool tip member which is in the form of a spatula 28 in FIG. 2. It is to be noted that the accessory tool tip 28 includes a threaded rod portion 29 receivable into the threaded aperture 24. Other types of accessory tool tips such as the tool tips 30, 32 and 34 illustrated in FIG. 1 can selectively be employed in the hand piece 20 in accordance with the particular work being performed.

A threaded sleeve 40 is received over a threaded end portion 42 of the hand piece 20 for retaining a ball-like swivel connector 44 in a recess in the hand of the threaded end portion. Swivel connector member 44 is connected to a flexible spring wire member 46 which has its other end connected to a vibrating core plunger 48 of a conventional electric power vibration means generally designated 50 in FIG. 1. The flexible spring wire member 46 is connected to the plunger 48 by a threaded sleeve 52 in the manner illustrated in FIG. 4. Core plunger 48 is vibrated by means of a coil 54 which receives power through a power line 56 and is controlled by a foot switch (not shown) through a control line 58 (FIG. 1).

The vibrating means 50 includes a housing casing 60 enclosing the coil 54 etc. with the core plunger 48 extending upwardly through a soft rubber sleeve 55 in an opening in the top of the casing. Casing 60 is mounted on a floor plate 62 which is, in turn, supported by means of rubber legs 64. Casing 60 also includes a laterally extending support portion 66 provided with a plurality of vertically oriented apertures 68 dimensioned to receive the threaded rod end portions 29 of the various accessory tips such as accessory tip 30 as shown in FIG. 4.

In addition, the casing 60 also includes a U-shaped trough-like portion 70 dimensioned to receive the hand piece 20 when the apparatus is not in use. Also, it should be noted that the power of the vibrations can be adjusted by a knob 72 illustrated in FIG. 1.

In operation, the vibrator means 50 is actuated so that vibrations from the core plunger 48 are conveyed to the flexible wire 46 to the hand piece 20 and thence to the accessory tool tip 28. It is to be noted that the vibrations pass directly through the hand piece 20 and are not impaired or dissipated by the user's hand 22. The vibrations can serve to deposit powdery material into the working area 10 as shown in FIG. 1 when the accessory tool tip is a spatula such as spatula 28. The deposited material can then be compacted by further use of the accessory tip 28 or by the employment of another tool tip such as the rounded ball type accessory tool tip 30 illustrated in FIG. 4 and silimarly illustrated in FIG. 1.

Numerous modifications of the preferred embodiment of this invention will undoubtedly occur to those of skill in the art, and it should be understood that the spirit and scope of the invention is to be limited solely in light of the following claims. For example, the vibrator can be an ultrasonic vibrator.

I claim:

1. Hand operated apparatus for enabling the application of damp or dry powdery material into a working area and for subsequently enabling uniform compacting of the powdery material in the working area, said apparatus comprising a main vibration power source

comprising an electric vibrator having a physically movable output member providing mechanical vibrations, a rigid pencil-shaped hand piece having first and second ends, accessory tip mounting means connected to said first end of said hand piece for fixedly connecting an accessory tip to said hand piece and a flexible wire-like mechanical vibration conveying means extending between said second end of said hand piece and said physically movable output member for continuously conducting a sufficient quantum of vibrations from said main vibration power source to said hand piece and an accessory tip mounted thereon to enable the compacting of said powdery material by said accessory tip.

2. The invention of claim **1** in which said flexible wire-like vibration conveying means comprises a metal spring wire member.

3. The invention of claim **1** wherein said accessory mounting means comprises a threaded aperture for receiving a threaded accessory tool in one end of said rigid pencil-shaped hand piece and said flexible vibration conveying means is connected to said hand piece by means of a swivel connector.

4. The invention of claim **1** wherein said electric vibrator includes a vibrating coil having a vibrating core extending upwardly, a casing encloseng said coil and incuuding a central aperture through which said vibrating core extends, said accessory mounting means comprises a threaded aperture in said hand piece for receiving a threaded accessory tool and wherein said flexible vibration conveying means is connected to said hand piece by means of a swivel connector.

5. The invention of claim **1** wherein said electric vibrator includes a vibrating coil extending upwardly, a casing enclosing said vibrating core and having a central aperture through which said vibrating core extends upwardly above said casing, said casing further including a laterally extending support member for supporting a plurality of said accessory tools with said support member including apertures into which said accessory tools are supportingly received, said flexible vibration conveying means being connected to said hand piece by means of a swivel connector and said accessory mounting means comprises a threaded aperture in said hand piece for receiving a threaded accessory tool.

6. The invention of claim **1** wherein said electric vibrator includes an upwardly extending vibrating core, a casing enclosing said electric vibrator and including a central aperture through which said vibrating core extends upwardly, said casing further including a laterally extending support member for supporting a plurality of said accessory tools in vertical orientation with said support member including apertures into which threaded portions of said tools are received, a trough type support member extending upwardly from the upper surface of said casing dimensioned to receive and hold said hand piece when said apparatus is not in operation, swivel connector means enabling connection of said flexible vibration coneyying means to said hand piece and said accessory mounting means comprises a threaded aperture in the end of said hand piece opposite said swivel connector for receiving a threaded accessory tool.

7. The invention of claim **6** additionally including variable adjustment means for adjusting the vibrational force of said vibrating means.

8. The invention of claim **7** wherein said flexible vibration conveying means is a spring wire member.

9. The invention of claim **2** additionally including swivel connector means connecting said metal spring wire member to said hand piece.

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