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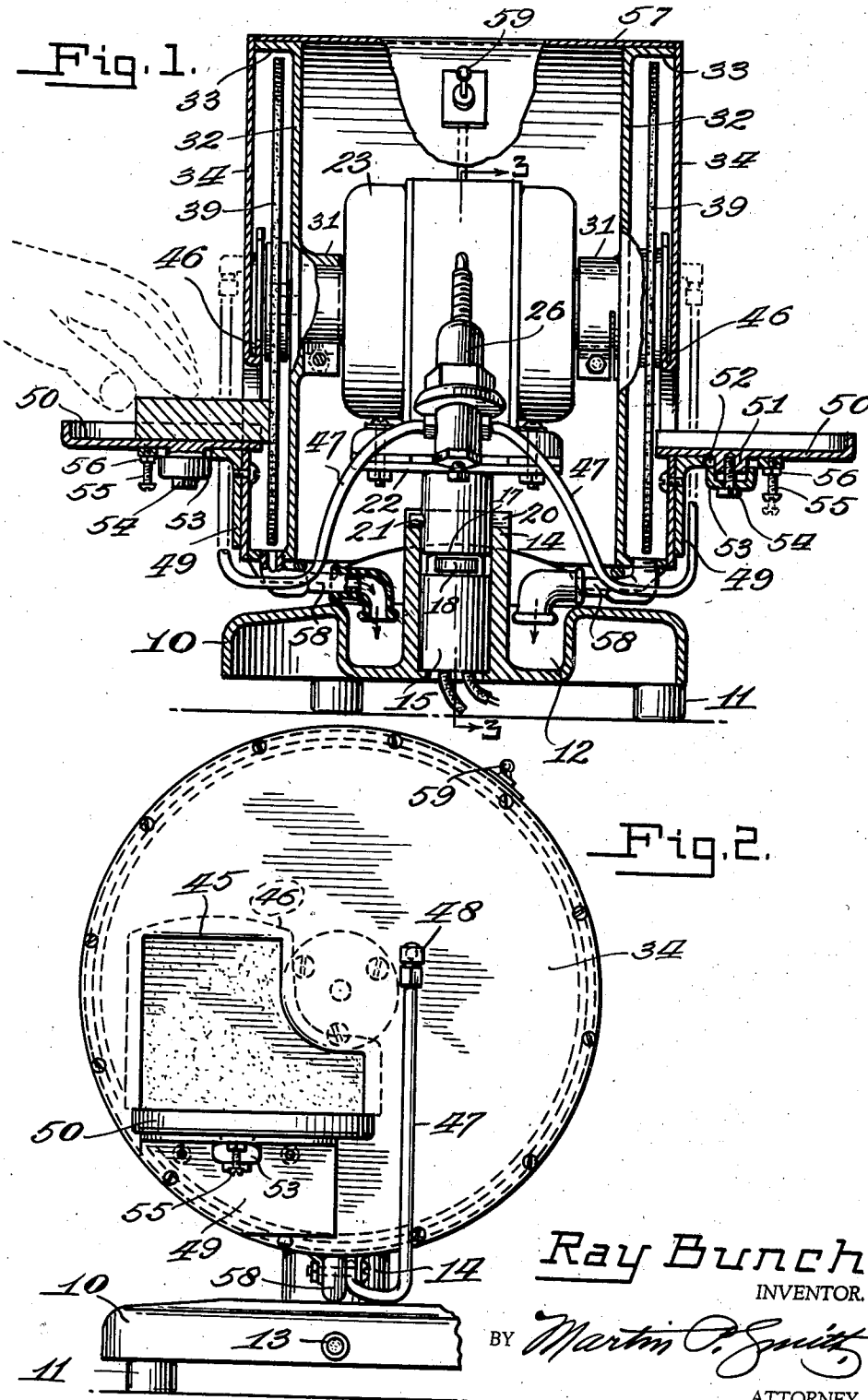
R. BUNCH

2,248,953

DENTAL MODEL TRIMMER

Filed June 1, 1938

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Fig. 3.

Fig. 4.

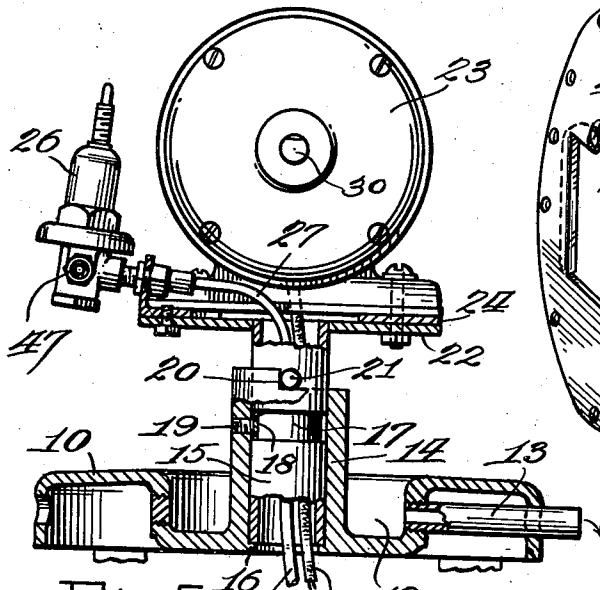
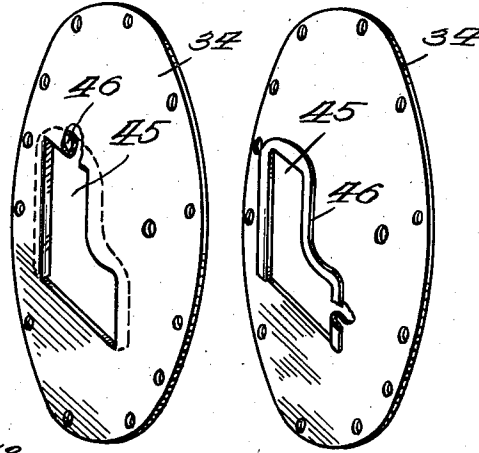


Fig. 5.

Fig. 7.

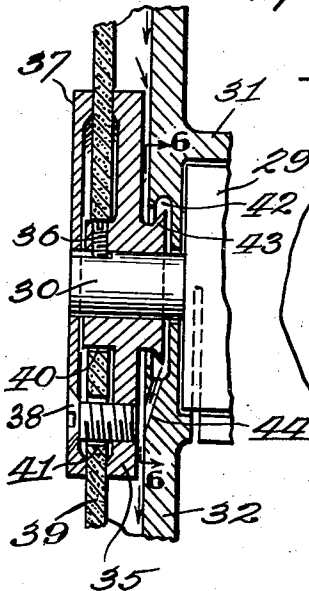


Fig. 6.

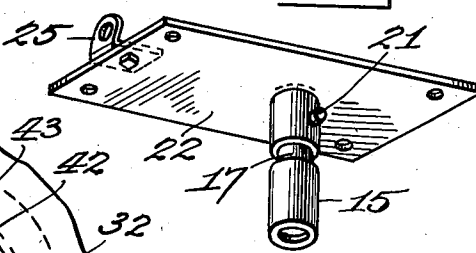
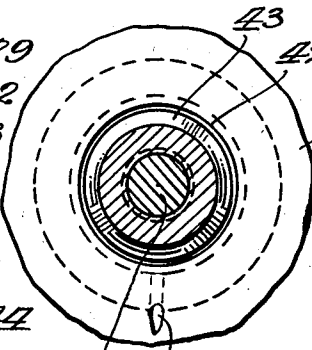
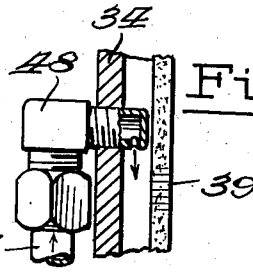


Fig. 8.



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DENTAL MODEL TRIMMER

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3 Claims. (Cl. 51-128)

My invention relates generally to grinding machines and more particularly to those machines employing abrading wheels and which are used in dental laboratories for the accurate and rapid trimming of the plaster casts made by dentists in the practice of their art.

The principal objects of my invention are to generally improve upon and simplify the construction of the existing types of dental model trimmers and to provide a relatively small, compact and readily portable machine having a pair of motor driven grinding disks, and which latter, by their abrasive action, very rapidly and effectively trim the dental casts that are moved into engagement with the faces of said grinding disks by the operator.

Further objects of my invention are to provide simple and efficient means for delivering jets of water onto the abrading faces of the grinding disks in order to wash away the cuttings from the work and to provide means for carrying away from the machine the water and cuttings; further, to arrange the motor and the grinding disks carried thereby within a housing, which latter is mounted for swinging movement on a base in order that the position of the housing and parts contained therein may be readily reversed so as to bring either one of the grinding wheels into position for use, and, further, to mount on the reversible housing adjustable supports for the work while the same is in engagement with the grinding disks.

Further objects of my invention are to provide simple and efficient means whereby the reversible housing that carries the motor and grinding wheels is firmly held while in both of its active or operative positions, so that there will be no rotary movement of the housing and the grinding wheels while the latter are engaged by the casts as the same are being trimmed, and, further, to provide means whereby the water delivered onto the abrasive faces of the grinding disks is prevented from splashing outwardly through the openings in the side walls of the housing and through which openings the casts are moved into engagement with the grinding wheels.

A further object of my invention is to provide means for controlling and regulating the pressure of the water that is delivered to the abrasive faces of the grinding disks.

With the foregoing and other objects in view my invention consists in certain novel features of construction and arrangements of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawings, in which:

Fig. 1 is a vertical section taken through the center of a dental model trimmer constructed in accordance with my invention.

Fig. 2 is a side elevational view of the machine.

Fig. 3 is a vertical section taken approximately on the line 3-3 of Fig. 1.

Fig. 4 is a perspective view of the two side walls of the housing of the machine.

Fig. 5 is a detail section showing the means employed for securing the grinding disks on the motor shaft and also showing the means for preventing the flow of water into the bearing of the motor shaft.

Fig. 6 is a detail section taken on the line 6-6 of Fig. 5.

Fig. 7 is a perspective view of the motor supporting plate or table and the post upon which said plate or table is supported.

Fig. 8 is a detail sectional view showing the means employed for delivering jets of water onto the grinding disks.

Referring by numerals to the accompanying drawings which illustrate a preferred embodiment of my invention, 10 designates the base of the machine which may be formed of either cast or pressed metal and finished as desired, and secured to the underside of said base are blocks 11, preferably of rubber, and which function as feet to support the base on a flat surface, and which tend to anchor the base to the surface on which the feet rest.

The central portion of the base 10 is depressed to form a pocket or chamber 12 for the reception of the water and cuttings carried thereby, and leading from this pocket or chamber are one or more outlet pipes 13 to the outer ends of which may be connected flexible tubes that carry off the water and cuttings.

Formed integral with and projecting upwardly from the center of the base is a tubular post or spindle 14 that serves as a bearing for a post 15, the lower end of the latter resting on a flange 16 that projects inwardly from the lower portion of the post or standard 14.

Formed in the outer face of the intermediate portion of tubular post 15 is a circumferential groove 17 and positioned therein is a short arcuate member 18 that functions as a brake shoe to prevent the post 15 from rotating too freely.

Screw seated in the wall of standard 14 is a screw 19, the inner end of which bears against the shoe 18 and thus the degree of pressure of the shoe against the periphery of the post 15 within groove 17 may be accurately regulated.

The upper end of standard 14 is cut away to form an oppositely disposed pair of shoulders 20, and which shoulders function as stops that are engaged by a stud 21 that projects outwardly from post 15.

The construction just described provides means for limiting the rotary movement of the tubular post 15 in both directions and permits the same and parts carried thereby to be swung through an arc of 180° and which movement is necessary to

reverse the positions of the grinding wheels while the trimmer is in service.

Suitably secured to the upper end of the tubular post 15 is a plate 22 that provides a support for an electric motor 23. The base of motor 23 rests upon spacers 24 that are positioned on top of plate 22 and upon the horizontally disposed lower portion of a bracket 25, the outer portion of which bracket projects upwardly from plate 22.

Removably secured to bracket 25 is a conventional water pressure regulating valve 26 and leading thereto is a flexible water supply tube 27 that extends downwardly through tubular post 15 to a suitable source of water supply, for instance, the water service main.

This regulating valve 26 is for the purpose of cutting down the pressure of the water that is delivered through supply line 27 and equalizing the pressure of the water that passes from said valve to the cutting disks.

The cable 28 that carries the electric conductors to and from the motor 23 extends through tubular post 15. Portions of the bearings 29 for the motor shaft 30 project beyond the ends of the motor housing and removably positioned upon said projecting portions are collars 31 that are formed integral with the central portions of circular plates 32, which latter serve as the inside end walls for the housing that encloses the motor and the grinding wheels.

Formed integral with the edges of the disks 32 are outwardly presented flanges 33 and removably secured to the outer edges of these flanges are disks or plates 34 that serve as the outer end walls of the grinding wheel housing. The narrow spaces between the inner and outer end walls 32 and 34 provide chambers for the grinding wheels that are carried by the motor shaft.

The means employed for securing the grinding wheels to the ends of the motor shaft is illustrated in Fig. 5 and such means includes an inner disk 35 that is secured to the motor shaft 30 by a set screw 36 and an outer disk 37 that is secured to inner disk 35 by screws such as 38.

A grinding wheel 39 of suitable abrasive material is clamped between the disks 35 and 37 and the central portion of each disk is provided with an opening 40 for the reception of the hub portion of disk 35 and with apertures 41 for the reception of the screws 38. When the grinding wheel is clamped between the disks 35 and 37 it overlies screw 36, thereby preventing the latter from becoming loose and unscrewing from hub of disk 35.

I prefer to provide grinding wheels having different degrees of abrasive qualities, for instance, one grinding wheel is formed of coarser material than the other so as to rapidly cut and grind the work, while the other wheel is formed of finer material or material having qualities for producing a smooth finishing cut.

Formed in the central portion of each inner end disk 32 around the central openings through which the motor shaft 30 passes is a narrow annular chamber 42 and projecting into said chamber from the inner face of the adjacent disk 35 is a flange 43 that decreases in width toward its outer edge.

Leading from the lower portion of the annular chamber 42 downwardly and outwardly to the outer face of the inner end wall 32 is a duct 44 which enables water and cuttings carried thereby to discharge from the annular chamber downwardly into and through the space between the inner and outer end walls 32 and 39. During ro-

tation of the cutting disk any water that flows downwardly over the inner face of disk 35 must necessarily pass over the tapered flange 43 and by centrifugal force this water will be thrown outwardly into the annular chamber 43 and discharge from the lower portion thereof through duct 44.

Formed through each outer end wall or plate 34 to the side of and below the axis of the grinding wheels, are openings 45 that permit the casts to be moved into contact with the outer faces of the grinding wheels; and in order to prevent the water that is delivered to the grinding wheels from splashing outwardly through the openings 45, narrow channels 46 that function as gutters are formed on the inner faces of the plates 34 above and to the sides of the openings 45 (see Fig. 4).

Leading from the lower portion of the equalizer valve 26 are tubes 47 that extend downwardly, thence outwardly beneath the pairs of end walls 32 and 34, thence upwardly and the upper ends of said tubes carry jet nozzles 48 that are seated in the outer end wall 34. The apertures in the jet nozzles 48 are arranged so that they discharge jets of water downwardly onto the outer faces of the grinding wheels (see Fig. 8).

The openings 45 in the outer end walls 34 occupy the same relative positions in said end walls and thus when casts are inserted through the openings 45 and pressed against the grinding wheels, the pressure transmitted through said wheels, the motor, the table and the tubular post 15 will be applied by the stud 21 to one of the shoulders 20, and thus the post 15 and parts carried thereby, including the motor and the housing, will be firmly held while a cast is being pressed against either grinding wheel.

Detachably secured to the outer faces of the outer end walls 34 below the openings 45 therein are inverted L-shaped brackets 49 positioned so that the upper faces of their horizontal portions lie flush with the lower edges of the openings 45.

Positioned on each bracket is a horizontally disposed cast-supporting table 50 and formed integral with and depending from the underside of each table is a lug 51 that projects through an opening 52 formed through the bracket.

Positioned on the underside of the bracket 49 is a washer 53 and passing therethrough and screw seated in the lug 51 is a screw or bolt 54 which firmly secures the work supporting table to the bracket.

In order to accurately adjust the tables 50 on the brackets, screws 55 are seated in the outer ends of the horizontal portions of the brackets 49 with the ends of said screws bearing against the undersides of the tables 50. Each screw 55 carries a lock nut 56 which, when tightened against the under face of the bracket 49 secures the screw in its adjusted position and consequently holds the table in its adjusted position.

Suitably secured to the outer faces of the flanges 33 on the inner end walls 32 is a circumferential wall 57 which, together with the walls 32 and 34, provides a substantially drum-shaped housing that encloses the motor and the parts that support same. The ends of this circumferential wall terminate at the bottom of the housing and said ends are spaced a sufficient distance apart for the accommodation of the tubes 47 and for the accommodation of drainage tubes 58 that lead from the bottoms of the chambers between the end walls 32 and 34 into the pocket 12 that is formed in base 10. These drainage tubes carry

the water and cuttings from the chambers between the end walls 32 and 34 into the pocket 12 and said water and cuttings discharge from said pocket through the waste outlet 13.

Seated in the upper portion of the circumferential wall 57 is a conventional switch 59 that is located in the motor circuit and which controls the flow of current through said circuit to said motor.

In the operation of my improved dental model trimmer, switch 59 is manipulated to close the circuit to the motor and as the latter operates, the grinding wheels 39 carried by the ends of the motor shaft rotates at high speed in the chambers between the end walls 32 and 34. Water is permitted to flow through tube 27 to the equalizer valve 26 and water at uniform and reduced pressure, passes from the equalizer valve through tubes 47 and is discharged from the jet nozzles 48 directly onto the outer faces of the grinding wheels. Equalizer valve 26 may be located on either end of tube 27.

The dental casts are placed on the tables 50 and moved inwardly through the openings 45 in the outer end walls 34 into direct contact with the outer faces of the grinding wheels and as a result of the abrasive action of the wheels on the casts the latter are trimmed to the desired degree and shape.

As heretofore described the pressure imparted to the casts during the grinding and trimming operations is transmitted to the stud 21 which bears against the solid shoulder 29, thereby firmly holding the motor and housing during the cast trimming operations.

The water delivered onto the surfaces of the grinding wheels washes the cuttings downwardly into the lower portions of the chambers between the end walls 32 and 34 and such water and cuttings after passing through tubes 58 and pocket 12 discharge through the waste outlet 13. This arrangement is particularly advantageous inasmuch as all dust arising from the cutting of the casts and which would be injurious to the health of the operator is eliminated.

During the operations incident to the grinding and trimming of dental casts and the like, the motor containing housing may be swung half-way around on the base to bring the desired grinding wheel into position to be engaged by the work and thus it is not necessary to turn the complete machine half-way around or for the workman to move from one side of the machine to the other while the casts are being cut or trimmed.

Thus it will be seen that I have provided a dental model trimmer that is relatively simple in construction, inexpensive of manufacture, and very effective in performing the functions for which it is intended.

While I have described my improved grinding machine as being especially applicable for use in grinding and trimming dental casts, it will be understood that the machine with very few, if any, changes or modifications may be advantageously employed for grinding any non-metallic or metallic substances or articles.

The machine is compact, capable of being readily moved from one position to another, thus facilitating the handling and transportation; and 70

through the abrasive action of the grinding wheels upon the work, the time, labor, and consequent expense in the trimming of dental models and the like are minimized; and at the same time accuracy in the cutting and trimming of the casts is insured.

It will be understood that minor changes in the size, form and construction of the various parts of my improved dental model trimmer may be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. In a dental model trimmer, a base, a vertically disposed post mounted for limited rotary motion on said base, a motor supported by said post, grinding wheels carried by the end portions of the shaft of said motor, a housing enclosing said motor and movable therewith, partitions arranged within said housing and dividing the space therein into a centrally arranged motor chamber and separate chambers for said grinding wheels, means having a portion extending through the vertically disposed post for delivering water to the outer faces of said grinding wheels there being a pocket formed in the top of said base, means for conducting water from the lower portions of the grinding wheels chambers to said pocket, there being openings formed in said housing for exposing portions of said grinding wheels, and work-receiving tables secured to said housing below the openings therein.

2. In a dental model trimmer, a base, a vertically disposed post mounted for rotary movement on said base, a motor carried by said post, a housing carried by and enclosing said motor, said housing having an end wall, a grinding wheel carried by the shaft of the motor within said housing, a partition arranged within said housing between said motor and said grinding wheel, the end wall of the housing being provided with an opening that exposes a portion of the outer face of said grinding wheel, a work support on the exterior of the housing below the opening therein, means for delivering water onto said grinding wheel there being a pocket formed in the top of said base, means for conducting water from the lower portion of the grinding wheel chamber in the housing to said pocket, and a gutter formed on the inner face of the end wall of the housing above and to the sides of the opening therein.

3. In a dental model trimmer, a base, a vertically disposed post mounted for rotation on said base, a motor carried by said post, grinding wheels carried by the shaft of said motor, a housing supported by said motor and enclosing said grinding wheels and said motor, partitions arranged within said housing and dividing the space therein into a centrally arranged motor chamber and grinding wheel chambers, means for delivering water to said grinding wheels there being a pocket formed in the top of said base, means for conducting water from the lower portions of the grinding wheels chambers to said pocket, means for limiting the rotary motion of the post in both directions, and adjustable means for controlling the rotary motion of said post.

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