June 19, 1951 M. GANZ 2,557,377

COUPLING FOR DENTIST'S DRILL HAND-PIECE DETACHABLE SPRAY NOZZLE STRUCTURES

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Fig. 1.

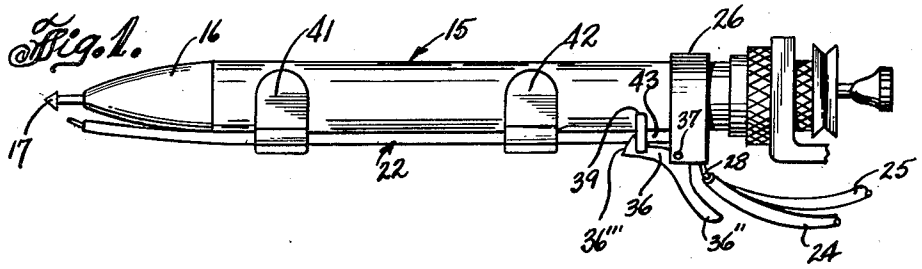


Fig. 2.

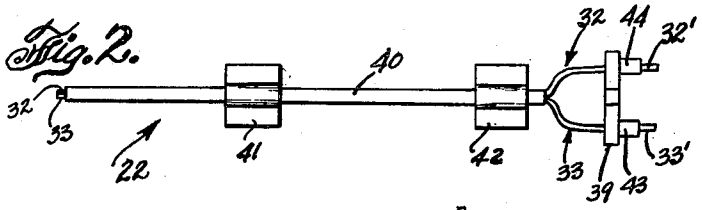


Fig. 7.

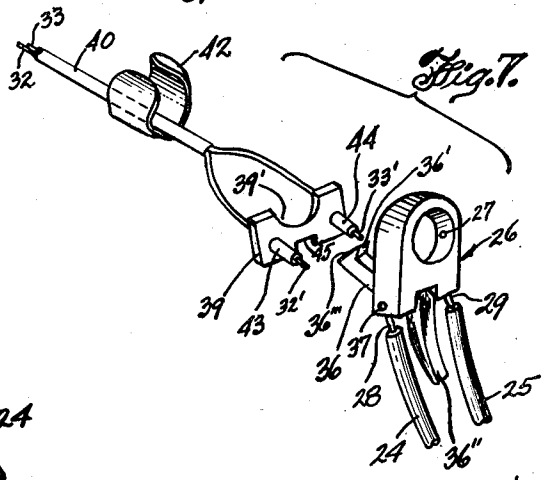


Fig. 3.

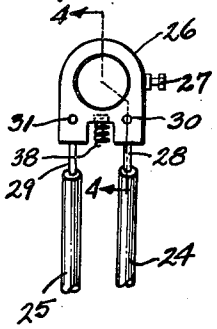
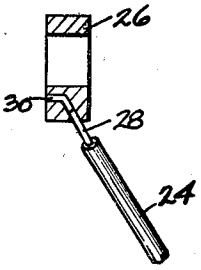


Fig. 4.



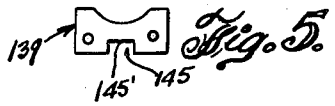


Fig. 5.

Fig. 6.

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COUPLING FOR DENTIST'S DRILL HAND PIECE DETACHABLE SPRAY NOZZLE STRUCTURES

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3 Claims. (Cl. 32—28)

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The present invention relates to attachments for the hand-pieces of dentists' drills, to direct a spray, onto or in the region of the cutting point of the rotating tool, and more particularly to coupling means for connecting air and water supply lines to the spray nozzles; such nozzles being changed whenever a contra-angle hand-piece is mounted on, or removed from the straight hand-piece.

The principal object of this invention is to provide novel and improved means for coupling the mentioned supply lines with interchangeable spray nozzles which are detachably carried on the straight hand-piece of a dentist's drill.

Another object hereof is to provide a novel and improved coupling means of the character mentioned, which will guide the spray nozzle structure into proper position on the straight hand-piece, to effect an alignment of parts necessary to accomplish the required connections, and thereafter serve to detachably lock the nozzle structure onto the body of said hand-piece.

A further object of this invention is to provide novel and improved coupling means of the type described, which is reasonably cheap to manufacture, easy to use and efficient in carrying out the purposes for which it is designed.

Other objects and advantages will become apparent as this disclosure proceeds.

In the accompanying drawings forming part of this specification, similar characters of reference indicate corresponding parts in all the views.

Fig. 1 is a longitudinal view of a straight hand-piece of a dentist's drill including a detachably mounted spray nozzle structure and the coupling means therefor, in accordance to the teachings of this invention.

Fig. 2 is a bottom view of the spray nozzle structure shown in Fig. 1.

Fig. 3 is an end view of the coupling means, as viewed from the left in Fig. 1. To attain clarity of illustration, a pawl member included in such means, is omitted in this Fig. 3.

Fig. 4 is a section taken at line 4—4 in Fig. 3.

Fig. 5 is an end view of a yoke carried on the spray nozzle means, as viewed from the left in Fig. 1.

Fig. 6 is a longitudinal view of a contra-angle hand-piece carrying its own spray nozzle structure, in accordance with this invention.

Fig. 7 is an "exploded" perspective view of the coupling means details.

In the drawings, the numeral 15 designates generally the straight hand-piece of a dentist's drill whose chuck 16 holds a rotatable tool 17,

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or else such tool may be removed and the contra-angle hand-piece denoted generally by the numeral 18, may be mounted in known fashion onto the straight hand-piece 15, whereby chuck 16 enters socket 19, and engages shaft end 20, for transmission of rotary motion to tool 21.

When hand-piece 15 is to be used to directly hold the working tool 17, a spray nozzle structure indicated generally by the numeral 22, is mounted detachably along said hand piece. When it is desired to use the hand-piece 18, mounted as mentioned onto the hand-piece 15, the spray nozzle structure 22 is first removed from the hand-piece 15, so that the spray nozzle structure denoted generally by the numeral 23, which may be demountably or permanently carried on the hand-piece 18, may be mounted detachably along hand-piece 15, while hand-piece 18 is mounted onto the hand-piece 15.

Heretofore, every time a spray nozzle structure was changed on the hand-piece 15, it was necessary to disconnect the flexible air and water supply pipes or tubing 24 and 25, respectively, from the nozzle structure removed, and such supply lines had then to be connected onto the nozzle structure newly mounted.

The present invention provides a permanent connection of the supply lines 24 and 25 on a coupling member denoted generally by the numeral 26, which is in the form of a collar on the hand-piece 15, held in place by the set screw 27.

Two nipples 28 and 29, extend from said collar 26, and are connected respectively to the air and water supply lines 24 and 25. The collar has two holes therein, indicated by the numerals 30 and 31, opening at the face of said collar which is nearest the chuck-end of the hand-piece 15. Said holes, commencing at this face of the collar 26, extend parallel to the longitudinal axis of the hand-piece 15, to serve as sockets for the respective ends of the tubes 32 and 33, of the spray nozzle structure 22; such tube ends being designated by the numerals 32' and 33', and likewise for the ends 34' and 35' of the tubes 34 and 35 of the spray nozzle structure 23. Said nipples 28 and 29, respectively, continue the other ends of said holes 30 and 31.

Between the socket openings of the holes 30 and 31, the collar 26 carries a toothed pawl 36, swingably mounted on said collar on an axis pin 37 which is perpendicular to the longitudinal axis of the hand-piece 15; the tooth 36' of said pawl being in front of the said socket openings, intermediate and clear of them, and urged against the body of the hand-piece 15, by the spring

38. For convenience, said pawl may have a finger piece 36'', so that it can be manipulated in trigger-fashion, so that the yoke 39 may be released from the hold of the pawl, whereby the nozzle structure 22, or else 23, as the case may be, becomes free to be manually slid off the hand-piece 15.

A tube 40 having the clips 41 and 42 spaced thereon, is the sheath for the tubes 34 and 35, whose discharge ends are at the tool 17, when the structure 22 is mounted on the hand-piece 15 so that the clips encircle and engage the hand-piece body. The tube ends 34' and 35' extend from said sheath tube 40, and are respectively bent to be spaced parallel and suited to enter the socket openings of the holes 30 and 31, respectively, up to the resilient tubular spacers 43 and 44, carried on such spaced ends 34' and 35', which are next to the yoke 39 bridging said end portions. Such spacer members 43 and 44 act as gaskets to insure leak-proof joints.

The yoke 39, rests against the body of the hand-piece 15, and is there shaped to conform to such body, as at 39'. Between the tubes 34 and 35, the said yoke 39, in its edge which is remote from the hand-piece, is provided with a notch 45. This notch is of a width to slidably admit the pawl 36, whereupon the tube ends 32' and 33' are respectively in alignment with the sockets 30 and 31, respectively.

The yoke 139 and the gasket members next to it on the spray nozzle structure 23, are identical to like parts on the spray nozzle structure 22.

The parts are so dimensioned, that when a spray nozzle structure is mounted on the hand-piece 15, so that the intake ends of the nozzle tubes are in the respective sockets 30 and 31, the yoke 39 (or 139) shall be held by the tooth 36' of the pawl 36, locked against movement along the hand-piece 15, and the gasket members 43 and 44 shall be slightly compressed.

When it is desired to mount the implement shown in Fig. 6, onto the straight hand-piece 15, the spray nozzle structure 22, is of course first removed therefrom. It is evident that this is done by fingering piece 36'' to swing the pawl 36 so that yoke 39 is free of the tooth 36', and then manually sliding said structure 22 to withdraw from the sockets 31 and 30, and continue such movement until said structure 22 is slid off said hand-piece 15.

Now the implement illustrated in Fig. 6 is slid on the hand-piece 15, so that chuck 16 enters the socket 19, and so that shaft 20 shall enter the chuck 16, and too, so that the toothed end of the pawl 36 shall enter the notch 145 in yoke 139. The edge 145' of said notch 145 will contact the slopping surface 36''' of the pawl's tooth 36', and act as a cam to shift the pawl 36. Said tooth will engage the yoke 139, locking the nozzle structure 23 onto the hand-piece 15, when the intake ends 34' and 35' are respectively in the sockets 31 and 30, a predetermined distance. When pawl 36 is within the notch 145', said intake ends 34' and 35' are respectively aligned for entrance into the said sockets of the coupling member 26.

The manner of removal of the implement of Fig. 6 from off the hand-piece 15, and replacement of nozzle structure 22 on said hand-piece as shown in Fig. 1, needs no further explanation, in view of the above disclosure.

Although the coupling member is here shown attachable and detachable, so as to be adapted for existing hand-pieces, it may be an integral or a fixedly secured part with such hand-piece. Also, the media fed to the nozzle structure may be other than air and water as mentioned, and of course nozzle structures and suitable coupling means therefore in accordance herewith, may be provided when there is only one intake tube, or any number.

This invention is capable of numerous forms and various applications without departing from the essential features herein disclosed. It is therefore intended and desired that the embodiment shown herein shall be deemed illustrative and not restrictive and that the patent shall cover all patentable novelty herein set forth; reference being had to the following claims rather than to the specific description herein to indicate the scope of this invention.

I claim:

1. In combination with a hand-piece which includes the chuck of a dentist's drill, a coupling member carried on the body of said hand piece spaced from the chuck; said member being provided with a plurality of parallel sockets opening in a face thereof, nipples respectively communicative with the interior of the respective sockets and extending from said member, a nozzle structure adapted to be positioned to discharge in the region of the chuck; said nozzle structure having one intake tube for each socket; said nozzle structure being adapted to be detachably mounted on the hand-piece whereby the intake end of each of said tubes is slidingly fitted into one of said sockets respectively and means carried on the coupling member co-operating with said nozzle structure to guide the intake ends of said tubes into said sockets respectively when the spray nozzle structure is slid onto the hand piece and to detachably lock said nozzle structure on the coupling member.

2. The combination as defined in claim 1, wherein the means for guiding and locking the nozzle structure includes a movably mounted member adapted to be shifted by the nozzle structure during movement of the latter onto the hand-piece and to detachably engage the nozzle structure onto the hand-piece only when the ends of the tubes are respectively within the sockets a predetermined distance.

3. The combination as defined in claim 1, including gasket means carried on each of the tubes of the nozzle structure spaced from the intake ends of said tubes and held against movement towards the discharge ends of said tubes respectively and adapted to contact the coupling member and be compressed thereby when the intake ends of said tubes are positioned within the sockets and the nozzle structure is locked on the coupling member.

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REFERENCES CITED

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

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