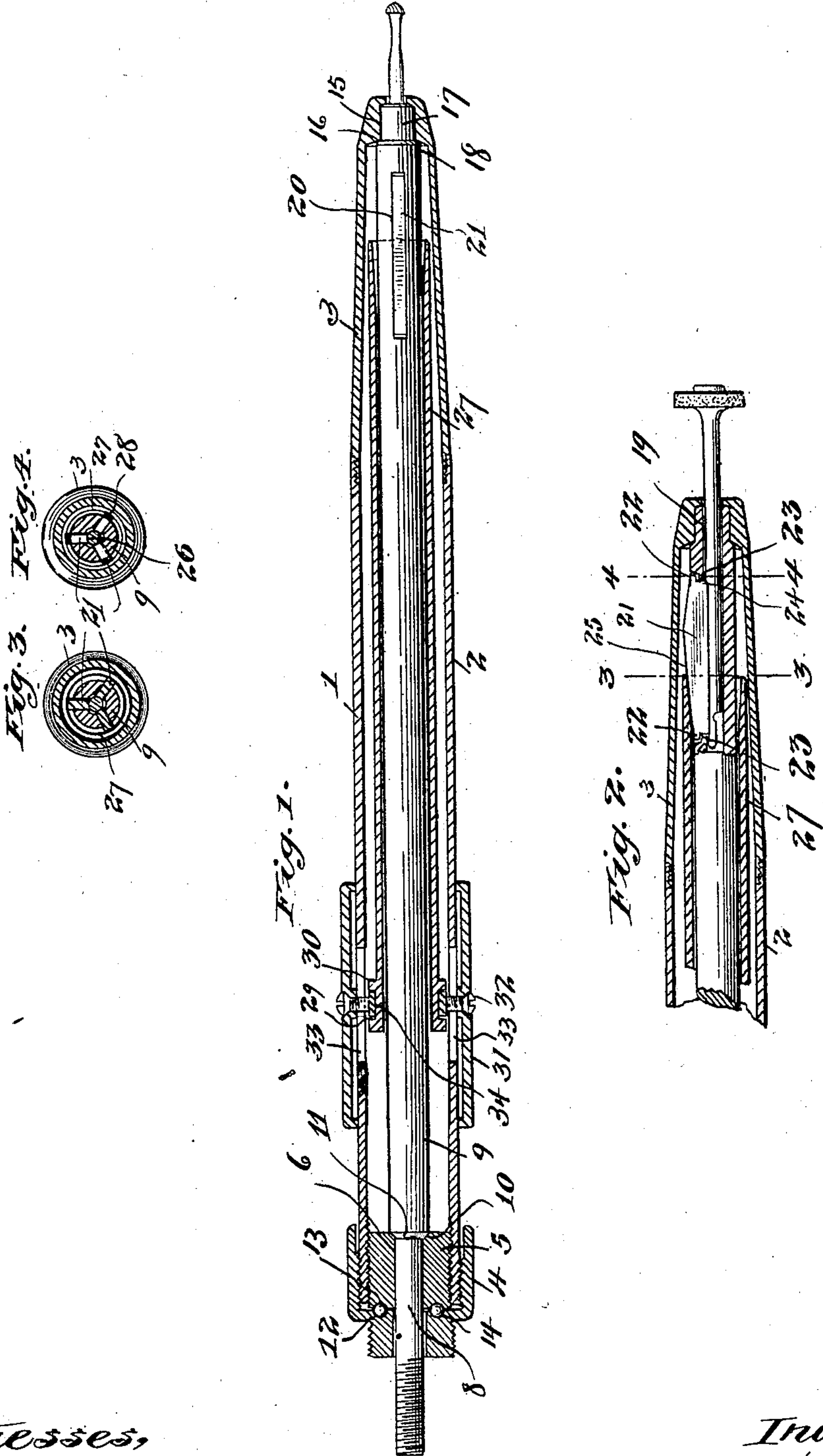


No. 837,423.

PATENTED DEC. 4, 1906.

A. C. SARGENT.  
DENTAL HANDPIECE.

APPLICATION FILED JULY 13, 1903.



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# UNITED STATES PATENT OFFICE.

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## DENTAL HANDPIECE.

No. 837,423.

Specification of Letters Patent.

Patented Dec. 4, 1906.

Application filed July 13, 1903. Serial No. 165,295.

*To all whom it may concern:*

Be it known that I, ALSON C. SARGENT, a resident of Des Moines, in the county of Polk and State of Iowa, have invented certain new and useful Improvements in Dental Handpieces, of which the following is a specification.

This invention relates to improvements in dental handpieces; and it has for its object to provide a simplified and improved construction of the character referred to.

The invention consists in the matters hereinafter described, and more particularly pointed out in the appended claims, and the same will be readily understood from the following description, reference being had to the accompanying drawings, in which—

Figure 1 is an axial sectional view of a handpiece embodying my invention. Fig. 2 is a similar view of the tool-holding end thereof on a larger scale. Fig. 3 is a cross-sectional view taken on line 3 3 of Fig. 2, and Fig. 4 is a cross-sectional view taken on line 4 4 of Fig. 2.

Referring to the drawings, 1 designates the main outer casing of the handpiece, which comprises a central main portion 2, a forward end cap 3, detachably screwed to the main portion, and a rear end cap 4, arranged to telescope upon the corresponding end of the main casing and also having screw-threaded engagement therewith. Within the rear end of the handpiece is adjustably seated a bearing-plug 5, provided with an axial bearing-aperture 6, which receives a reduced portion 8 of the main spindle 9 and which bearing-aperture terminates at its forward end in a conical seat 10, forming a step-bar against which a correspondingly-beveled shoulder 11 of the spindle fits. The outer end of the bearing-plug 5 and the inner face of the cap member 4 are opposed to each other, and within said opposing faces are formed ball grooves or races 12 and 13, between which are interposed ball-bearings 14. The spindle 9 extends throughout the length of the handpiece and at its forward end engages a bearing in the end of the cap member 3, said cap member being to this end provided with an axial bore 15 and the conical seat of step-bearing 16 surrounding said bore interiorly, within and against which bearings the correspondingly-shaped portions 17 and 18 of the spindle sit.

The end of the spindle is axially bored, as indicated at 19, to receive the shank of a dental tool and is also provided with a plu-

ality of radially-disposed slots or mortises 20, (three in the present instance,) disposed at equal angular distances apart and constructed to accommodate a set of chuck-jaws 21. The chuck-jaws are of peculiar construction, being freely movable radially within the slots or mortises, but prevented from moving inwardly beyond a predetermined point by means of shoulders 22, formed upon their ends and overlying and engaging corresponding shoulders 23, formed in the ends of the mortises. The corners formed at the junction of the inner faces of the jaws with their forward end faces are rounded, as indicated at 24, to facilitate the entrance of the shank of the tool into position between the jaws.

The chuck-jaws are each wedge-shaped or of increasing width radially from their rear or inner ends forwardly throughout their principal lengths. The taper of the jaws is, however, comparatively slight, the tapering portion 25 shown in the drawings being considerably exaggerated in order to be more clearly perceptible. The inner faces of the jaws which engage the shank of the tool are straight in longitudinal directions and preferably curved in cross-section, as indicated at 26 in Figs. 3 and 4.

27 designates a chucking-sleeve which is arranged to fit upon the spindle throughout its principal length and at its forward end telescopes partly over or upon the wedge-shaped jaws 21. In order that the forward end of the chucking-sleeve may thus fit over the jaws, it is made slightly flaring interiorly at its forward end, the flare being preferably of the same angular degree of taper as the portions of the jaws engaged thereby. In this connection it is to be noted that the outer edges or surfaces of the jaws engaged by the chucking-sleeve are rounded, as indicated at 28, to conform to the internal shape of the sleeve.

At its opposite end the chucking-sleeve is provided with an annular groove 29, which preferably and as shown in the present instance, is formed in an enlargement or collar 30. 31 designates a sleeve-like slide mounted upon the exterior of the handpiece around the grooved portion of the chucking-sleeve and connected with the latter by means of a pair of screw-studs 32, arranged in diametrically opposite relation and extending through slots 33, formed in the outer casing. Preferably, in order to reduce the



friction and lessen the rasping noise or vibration, the screw-studs do not directly engage the annular groove of the chucking-sleeve; but a brass or analogous soft-metal collar 34 is seated in said groove 29, and the screw-studs engage suitable sockets formed in said collar.

The operation of the handpiece constructed as described will be entirely obvious without further description. It is to be noted, however, that by reason of the bearings provided at the extreme ends of the spindle by means of the adjustable bearing-plug 5 the spindle may be confined with the greatest accuracy and freedom from lost motion, while at the same time its freedom of rotation is not interfered with. This condition obtains throughout the entire life of the handpiece regardless of wear. It is also to be especially noted that by reason of the provision of the ball-bearings between the confining-cap 4 and the end of the bearing-plug the latter may be adjusted to hold the spindle with the utmost nicety and the confining-cap subsequently screwed down firmly without danger of disturbing the adjustment of the bearing-plug. It is also to be noted that in the present construction I have dispensed with all ratchets, spring-latches, or the like for holding the chuck-jaws in engagement with the tool and rely entirely upon the frictional engagement of the chucking-sleeve with said jaws.

I have found in practice that by reason of the long and relatively slight tapering fit between the chucking-sleeve and jaws this method of fastening is entirely reliable and that the chuck-jaws accommodate themselves to shanks of varying dimensions with perfect facility. This feature is one of great importance, since I am thus enabled to simplify the tool as a whole to a minimum number of parts, all of which parts are of simple, cheap, and durable construction.

Another feature of improvement resides in so constructing the forward end cap that it is removable and separates from the main shell at a point back of the chuck, so that when said cap is removed the chuck is fully exposed. This feature is of importance, since it not only enables me to clean and oil the spindle-bearing in this end of the handpiece, but it also affords the greatest freedom of access to the chuck for the purpose of cleaning and inspecting the latter. In this connection it is to be noted that the embracing end of the chucking-sleeve acting in conjunction with the peculiar-shaped notches or shoulders in the ends of the mortises prevents the jaws from becoming displaced when the tool is removed and the end

cap taken off, unless the chucking-sleeve be deliberately retracted to approximately its full extent.

While I have herein shown and described what I deem to be a preferred embodiment of the invention, yet the details thereof may be modified without departing from the invention, and I do not, therefore, limit myself to these details, except to the extent that they form the subject of specific claims.

I claim as my invention—

1. In a dental handpiece, the combination of a tool-holding spindle provided with an axial bore to receive the shank of a tool and with a plurality of mortises extending through the sides of the spindle into said bore, chuck-jaws loosely seated in said mortises each having a substantially straight inner face and a forwardly and outwardly inclined outer face protruding radially beyond the spindle, the ends of said mortises and of said chuck-jaws being provided with interfitting shoulders, a chuck-sleeve mounted to slide upon the spindle and having its forward end telescoping upon and engaging the outwardly and forwardly inclined surfaces of the chuck-jaws, an external slide upon the handpiece, and operative connections between said slide and said chuck-sleeve.

2. In a dental handpiece, the combination of a tubular outer casing, a spindle mounted to extend therethrough, said spindle having a shouldered and reduced rear end, and bearings for the opposite ends of said spindle comprising a relatively fixed forward end bearing and an adjustable rear end bearing consisting of an axially-bored screw-plug mounted upon the reduced rear end of the spindle and threaded into the end of the outer casing, and an end cap inclosing said screw-plug and threaded upon the exterior of the outer casing, substantially as described.

3. In a dental handpiece, the combination of a tubular outer casing, a spindle mounted to extend therethrough, and bearings for the opposite ends of said spindle comprising a relatively fixed forward end bearing and an adjustable rear end bearing consisting of a screw-plug threaded into the end of the outer casing, an end cap inclosing said screw-plug, surrounding the spindle and threaded upon the exterior of the outer casing, and antifriction-bearings interposed between the opposed portions of the screw-plug and end cap, substantially as described.

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Witnesses:

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