Oct. 23, 1956 W. F. LEACH 2,767,470

AMALGAM CARRIERS

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FIG. 1.

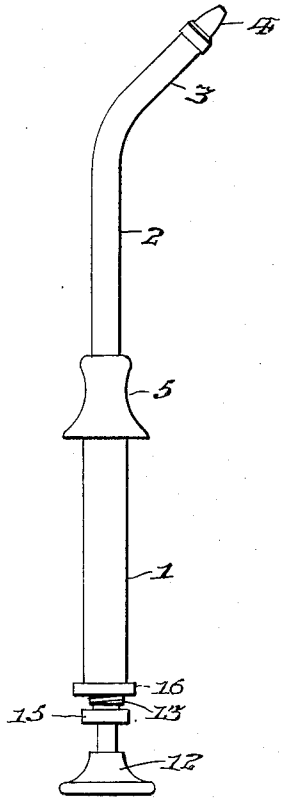


FIG. 2.

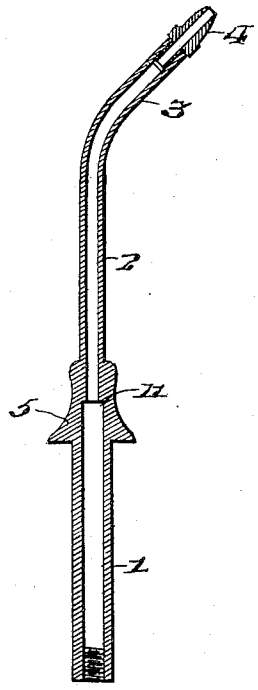
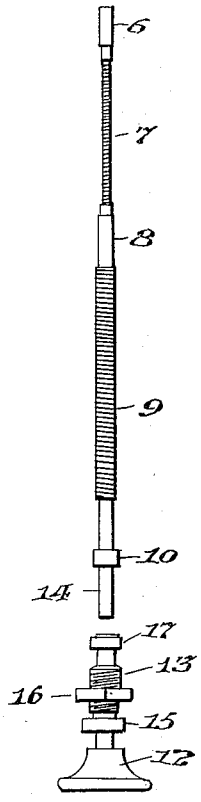


FIG. 3.



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AMALGAM CARRIERS

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4 Claims. (Cl. 32—60)

My invention relates to that class of dental implements that are generally known as amalgam carriers and are particularly adapted to insert amalgam of other filling material into a tooth cavity to form a stopping therefor and is especially directed to the means of connecting the plunger with the operating shaft.

An amalgam carrier usually comprises a tubular stem or barrel having a forward portion inclined at an angle convenient for presentation of the open end at a tooth in a patient's mouth, a collar at about the mid-length of the barrel, for engagement by the first and second fingers of the surgeon's hand, and a spring-loaded, partially flexible-shafted plunger in the rear end of which, protruding through a screw ferrule at the rear end of the barrel bears a knob by which the plunger can be thrust forward by pressure on the ball or heel of the surgeon's thumb.

The open forward end of the barrel, usually made as a removable tip-piece having a cylindrical bore slidingly fitting the head of the plunger, is charged with amalgam by pressing it against a freshly prepared mix of amalgam in a mortar or other amalgam mixing vessel and the amount of amalgam thus charged into the tip bore and subsequently ejected by the plunger head depends upon the extent to which the plunger head retracts into the bore of the tip-piece.

It is found generally that a surgeon likes to select for himself the amount of amalgam which his carrier will pick up and inject by a full-stroke of the plunger and to provide for this the plungers of amalgam carriers have been made adjustable in length, by screw-threaded interengagement of the stem of the knob and the shaft of the plunger, so that the surgeon can adjust the retracted position of the plunger head in the bore of the tip-piece and thus adjust the length of the bore available to receive amalgam up to the retracted head of the plunger.

The existing construction of adjustable-length plungers involves dismantling the carrier for adjustment and the present invention provides an amalgam carrier the capacity of which can be easily and quickly adjusted without such dismantling.

According to the invention, in a dental amalgam carrier comprising a barrel and plunger and having a screw-threaded ferrule engaged in the screw-threaded rear end of the barrel and limiting by abutment in both directions axial movement of the plunger, the ferrule is provided with a relatively long screw-threaded shank so that its axial position in the barrel, and thus the limit of retraction of the plunger head in the bore of the barrel, can be adjusted to vary the capacity of the bore of the barrel beyond the plunger head when retracted, and a lock-nut is provided on the screw-threaded shank of the ferrule to be screwed against the end of the barrel to hold the ferrule in adjusted position.

It will be appreciated that the retracted position of the plunger head in the bore of the tip-piece of the barrel of a carrier according to the invention can be simply adjusted by screwing forward or backward the ferrule, which limits the retraction of the plunger as a whole and thus controls the retracted position of the plunger head, and the relatively long screw-threaded shank of the ferrule accommodates and allows manipulation of the lock-nut.

Arising out of the fact that the present invention obviates the need for screw-threaded interengagement of the stem of the operating knob and the shaft of the plunger, there is another important feature of construction of the present invention which consists in making the stem of the operating knob freely rotatable relatively to the shaft of the plunger so that rotation of the knob cannot twist the plunger shaft. This avoids the liability of the carrier being damaged by attempts to clear a residue of amalgam from the bore of the tip-piece by forcible twisting of the plunger head by means of the operating knob. The proper method of clearing amalgam from the bore of the tip-piece is by gentle heating in a flame.

My invention also includes all of the various novel features of construction and arrangement as hereinafter more definitely specified.

The invention is illustrated by way of example on the accompanying drawing, in which:

Figure 1 is a side elevation of an amalgam carrier according to the invention.

Figure 2 is an axial section through the barrel, and

Figure 3 is a side elevation of the plunger and operating knob assembly axially separated.

The amalgam carrier as shown comprises a barrel having a handpiece portion 1, a forwardly extending relatively reduced portion 2, with a relatively deflected forward end section 3 leading to and supporting a removable nozzle or tip-piece 4 and an intermediate collar 5 for engagement with the first and second fingers of the operator's hand.

Arranged to be inserted through the internally screw-threaded rear end of the handpiece 1 is a plunger comprising a head 6, which slides as a piston in the bore of the nozzle 4, a flexible shaft section 7 of tightly coiled helically wound wire, a rigid shaft section 8 bearing a helical compression spring 9 for retracting the plunger and a rear-end collar 10, for retaining the spring 9. The forward end of the spring 9 bears against a shoulder 11 formed by a reduction in the bore between the part 1, and part 2 of the barrel.

The plunger-operating knob and the ferrule are made as a separate assembly unit comprising the knob or thumb-piece 12 which has a tubular stem 13 open at its forward end to receive as a free-turning fit the rear end of the plunger shaft rigid section 14 when the stem enters the rear end of the barrel. The ferrule 15 with its lock nut 16 is freely slidable on the stem 13 and is retained by a collar 17 on the forward end of the stem 13.

When the plunger is inserted in place in the barrel, the plunger head 6 fits in the bore of the nozzle 4, as a piston in a cylinder, and the collar 10 on the rear end of the shaft 14 rests, under the thrust of the spring 9 against the forward end of the knob stem 13, the rear end of the shaft 14 being located inside the stem 13. Thus, when the knob 12 is thrust forward with respect to the barrel, the plunger is moved axially forward within the barrel against the resistive thrust of the spring 9 until the knob 12 abuts against the rear end of the ferrule 15. When the knob 12 is released, the spring 9 returns the plunger until the collar 17 on the stem 13 abuts against the forward end of the ferrule 15. It will therefore be understood that the operating knob and plunger move as a unit in both directions.

The full axial movement of the plunger is equal to the difference between the length of the ferrule 15 and the length of the stem 13 between the knob 12 and collar 17 and this is constant. The effective stroke of the plunger is of course the movement of the plunger head 6 within the bore of the nozzle 4 and this depends upon the retracted position of the head as adjusted by the ferrule 15,

the forward end of which, as above mentioned, limits, by abutment thereagainst of the collar 17, the return movement of the plunger.

By screwing the ferrule 15 into or from the barrel, the operator can adjust the rearward position of the plunger head 6 in the bore of the nozzle 4 and thus control the amount of amalgam picked up when he presses the open end of said nozzle 4 into a mix of amalgam. The lock-nut 16, which, it will be noted, is slightly larger than the rim of the ferrule 15 for ease of manipulation, holds said ferrule in adjusted position when screwed forwardly tight against the end of the barrel of the handpiece.

I do not desire to limit my invention to the precise details of construction and arrangement as herein set forth, as it is obvious that various modifications may be made therein without departing from the essential features of my invention as defined in the appended claims.

Having thus described my invention, I claim:

1. A dental amalgam carrier comprising a barrel and plunger and having a screw-threaded ferrule engaged in the screw-threaded rear end of the barrel and limiting by abutment in both directions axial movement of the plunger, in which the ferrule is provided with a relatively long screw-threaded shank so that its axial position in the barrel, and thus the limit of retraction of the plunger head in the bore of the barrel, can be adjusted to vary the capacity of the bore of the barrel beyond the plunger head when retracted and a lock-nut is provided on the screw-threaded shank of the ferrule to be screwed against the end of the barrel of the carrier to hold the ferrule in adjusted position.

2. A dental amalgam carrier comprising a barrel and plunger and having a screw-threaded ferrule engaged in the screw-threaded rear end of the barrel and limiting by abutment in both directions axial movement of the plunger, in which the ferrule is provided with a relatively long screw-threaded shank so that its axial position in the barrel, and thus the limit of retraction of the plunger head in the bore of the barrel, can be adjusted to vary the capacity of the bore of the barrel beyond the plunger head when retracted and in which an operating knob for the plunger has a stem which is connected to the plunger for axial movement therewith but is freely rotatable relatively to the plunger so that the rotation of the knob cannot twist the plunger, and means for locking the ferrule in adjusted position.

3. A dental amalgam carrier comprising a barrel and plunger and having a screw-threaded ferrule engaged in the screw-threaded rear end of the barrel and limiting by abutment in both directions axial movement of the plunger, in which the ferrule is provided with a relatively long screw-threaded shank so that its axial position in the barrel, and thus the limit of retraction of the plunger head in the bore of the barrel, can be adjusted to vary the capacity of the bore of the barrel beyond the plunger head when retracted and in which an operating knob for the plunger has a stem which is connected to the plunger for axial movement therewith but is freely rotatable relatively to the plunger so that the rotation of the knob cannot twist the plunger, and a lock-nut is provided on the screw-threaded shank of the ferrule to be screwed against the end of the barrel of the carrier to hold the ferrule in adjusted position.

4. An amalgam carrier comprising a plunger arranged to be thrust forward to extrude amalgam from the bore of the nozzle of said carrier into a tooth cavity and having a relatively separate operating assembly comprising an operating knob having a forward projecting stem, a ferrule in which said stem is a free sliding fit, said ferrule being in threaded engagement with the rear end of the bore of said carrier for adjustment in said carrier, and a lock-nut axially adjustable on said ferrule and arranged to engage the rear end of said carrier when said ferrule is adjusted to determine the amount of amalgam to be extruded.

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