Dec. 21, 1937. H. HAGEMEIER 2,102,591

DENTAL SYRINGE

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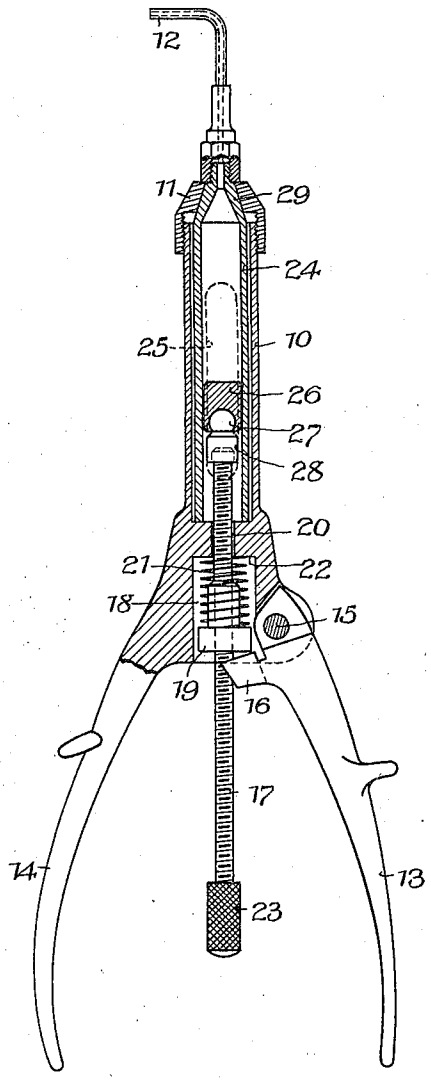

Fig. 1.

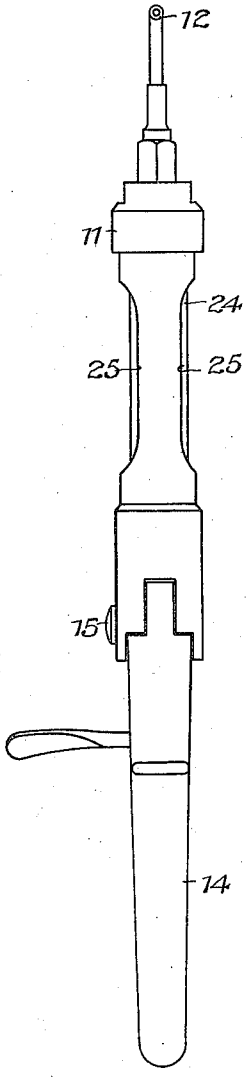

Fig. 2.

Inventor

Heinrich Hagemeier

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DENTAL SYRINGE

Heinrich Hagemeier, Hamburg, Germany

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3 Claims. (Cl. 128—236)

This invention relates to a syringe of the kind wherein the plunger or piston is operated by means of a pair of hand grips in the same way as tongs and pliers. Such syringes are already in use by dentists for administering narcotics, the plunger being in this case pivotally connected to the hand grip or grips, so that the position of the plunger relative to the operating elements remains constant. The object of the present invention is to obtain a syringe of this kind which allows of a gradual, stepwise discharge of its contents in predetermined quantities, and the invention consists in providing the syringe for this purpose with a plunger in the form of a screw spindle on which the operating elements act through the medium of an adjustable nut by which the position of the plunger within the barrel of the syringe can be regulated. The barrel is made long enough to allow the plunger to advance in the barrel in a plurality of successive steps.

With this construction of the syringe it is advisable to charge the latter with material through the medium of previously filled capsules from which the contents can thus be extruded stepwise by means of the plunger through a nozzle secured to the barrel or to the capsule, means being provided for admitting the capsule into the barrel either through the end of the latter or through lateral openings therein, and means being also provided for securing the capsule in position. In this manner the contents will be hygienically protected from outside influences. The plunger can be made to act on a piston which is fitted in the capsule as a closure for the latter and which may be connected to the plunger.

The capsule may be charged with tooth-filling cement in which case the cement can be transferred from the syringe directly into the tooth cavity and forced into the latter by a pressure on the hand grips. A complete and reliable filling of the tooth can thus be effected in a very short space of time without the introduction into the cavity of any filling instruments by which it may be contaminated and before any flow of saliva into the cavity can take place.

The syringe may be fitted with a bent extrusion nozzle which can be adjusted to the most convenient angle relative to the hand grips.

Fig. 1 of the accompanying drawing represents by way of example a sectional view of a syringe constructed according to the invention, and

Fig. 2 is an elevation thereof at right angles to Fig. 1.

The illustrated syringe comprises a body which is formed integrally with a hand grip 14 and which holds on a pivot 15 another hand grip 13 arranged in substantial symmetry with the hand grip 14 so that the syringe can be operated by means of the hand grips in the same way as a pair of pliers. Secured to the body opposite the hand grips is a barrel 10 in which a plunger in the form of a screw spindle 17 is adapted to operate. The plunger is guided in a bore 20 in the body, and a widened portion 18 of this bore accommodates a headed nut 19 arranged adjustably on the screw spindle. The pivoted hand grip 13 is provided with a nose piece 16 which is preferably forked for accommodating the spindle and which engages under the head of the nut 19 so as to support it in opposition to a spring 21 which bears at one end against a shoulder 22 in the body and at the other end against the head of the nut. The spring tends to maintain the hand grip in its outer end position which is determined by a suitable abutment. By holding the hand grips and pressing them together, the grip 13 will be turned about its pivot, and the plunger 17 will be displaced in opposition to the spring 21 for extruding material from the barrel, the maximum displacement being determined by the abutment of the nut 19 against the shoulder 22. After each such displacement, the spindle 17 is screwed forwards in the nut by means of a milled head 23 for the extrusion of a fresh charge, the barrel being made long enough to allow a plurality of successive extrusions the magnitude of which can be varied by a partial operation of the hand grip 13.

The syringe can conveniently be used for filling teeth with cement, and the latter can then be supplied in capsules such as 24 adapted for insertion into the barrel 10 either through the outer end thereof or through lateral openings 25. A screw cap 11 adapted to bear snugly against a conical end portion 29 of the capsule, is screwed on to the end of the barrel for securing the capsule to the latter. In the illustrated arrangement the capsule is fitted with a screw nipple for the reception of an extrusion nozzle 12 which is bent and adjustable so that it can be set at the most convenient angle relative to the hand grips 13, 14. For the extrusion of the cement from the capsule, a piston 26 may be employed to which the plunger 17 may be connected by means of a ball joint, the ball 27 being attached to or formed with a socket 28 applied to the plunger.

The syringe may be modified within the scope of the invention as defined by the appended claims. For instance the barrel 10 may be adapted to hold the cement and to cooperate

direct with the piston 26 for the extrusion thereof. The spindle 17 may be adapted to bear against the piston without being connected thereto. Moreover, the connection of the nozzle 12 to the capsule 24 or to the barrel may be effected by other means than those described and illustrated, and both hand grips may be pivoted for the operation of the plunger.

I claim:

1. A dental syringe of the character described comprising a supporting body, a barrel secured to said body, a plunger in the form of a screw spindle guided longitudinally in said body and in the barrel, a nut on said spindle, a pair of hand grips on the body branching out from the latter at opposite sides of and substantially symmetrically with the spindle, and a lever operable by pressure on the hand grips at right angles to the spindle to engage said headed nut for the displacement of the plunger.

2. A dental syringe of the character described comprising a supporting body, a barrel on said body, a plunger in the form of a screw spindle guided longitudinally in said body for operation within the barrel, a headed nut on said spindle accommodated in a recess in the body and adapted to co-operate with the latter for limiting the displacement and regulating the position of the plunger within the barrel, a pair of hand grips on the body branching out from the latter at opposite sides of and substantially symmetrically with the spindle, one of said hand grips forming a lever operable by pressure on the hand grips at right angles to the spindle to engage said nut for the displacement of the spindle within the barrel, and a spring arranged between the body and the head of the nut for opposing the displacement of the plunger by said lever.

3. The structure claimed in claim 2 in combination with a capsule adapted to be accommodated in the barrel, means for securing the capsule to the barrel, a nozzle adapted for attachment to the barrel, a piston in the capsule, and a ball joint connecting said piston with the plunger and operative to transmit motion from one to the other for extruding the contents of the capsule through the nozzle.

HEINRICH HAGEMEIER.