

Jan. 20, 1959

R. C. BONVINI ET AL

2,869,763

SYRINGE FOR EJECTING PLASTIC MATERIAL

Filed April 3, 1957

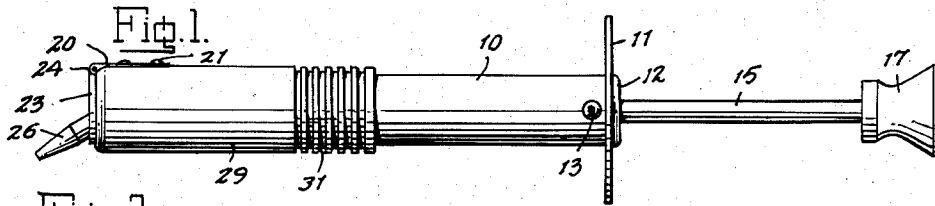


Fig. 2.

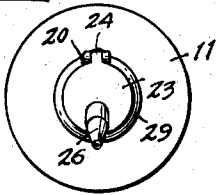


Fig. 7.

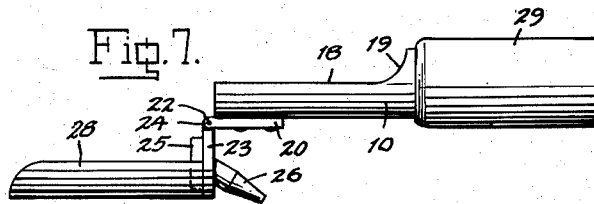


Fig. 3.

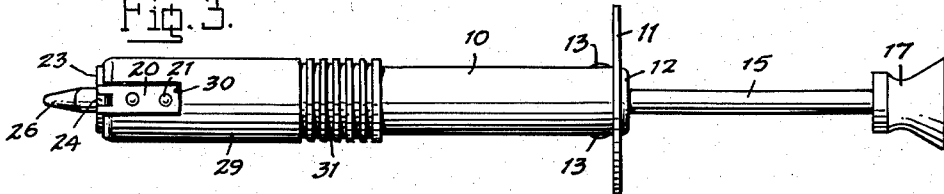


Fig. 4.

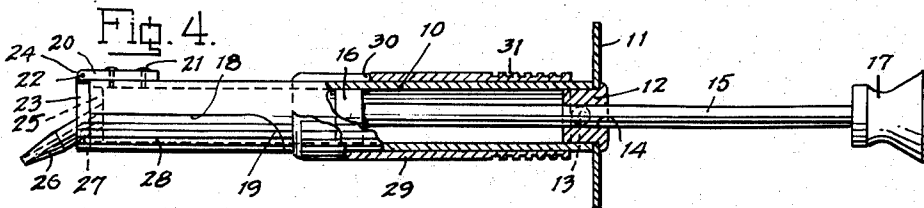


Fig. 5.

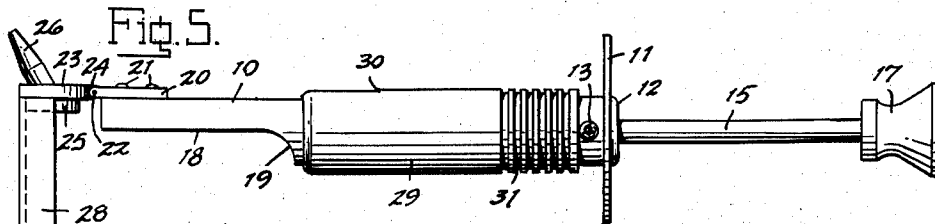
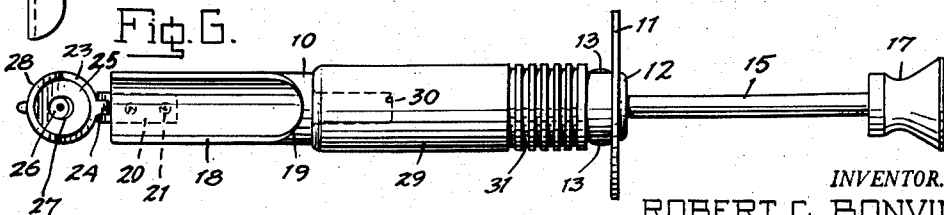


Fig. 6.



INVENTOR.
ROBERT C. BONVINI
BY
Samir Watter
ATTORNEY.

1

2

2,869,763

SYRINGE FOR EJECTING PLASTIC MATERIAL

Robert C. Bonvini, Bridgeport, and Walter F. Gryskiewicz, Devon, Conn.

Application April 3, 1957, Serial No. 650,412

3 Claims. (Cl. 222—388)

The present invention relates to a syringe, particularly for use in the dental profession for the making of inlay and bridge impressions from plastic material. The usual procedure in forming such impressions is to employ a syringe to inject the plastic material into cavities and recesses, and to then press a quantity of the material over the teeth by the use of an impression tray, the syringe injected and the tray impressed materials becoming bonded to form the complete impression. It has been the practise to provide the plastic material in both heavy-bodied form for convenient use in the tray, and in light-bodied free-flowing form to enable it to be drawn into the syringe. The dentist is therefore required to prepare and handle two batches of material, and because of its rapid setting nature considerable dexterity and speed is required.

It is an object of the present invention to provide a syringe which permits of convenient filling with the plastic material in its full-bodied form, thus permitting the procedure to be carried out with a single batch of material, and making for greater convenience and efficiency. To this end it is proposed to provide a syringe having a barrel including a gate-like swinging part, by means of which the barrel may be opened to permit of the convenient placing therein of the full-bodied plastic material with the use of a spatula or other instrument.

It is a further object to provide a syringe in which the gate-like part will present an open side disposed in the same direction as the open side of the barrel, so that both the gate-like part and the barrel may be conveniently filled with the plastic material.

Another object is to provide a syringe which may be maintained in a sterilized condition, and also which will permit of the easy removal of such material as remains in the syringe following the ejecting operation, the syringe structure being free of any parts in which the material, when it becomes hard, will interlock.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it will be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevation of a syringe according to the invention, the same being shown in its normal closed state with the plunger partially withdrawn;

Fig. 2 is a front elevation;

Fig. 3 is a top plan view;

Fig. 4 is a view partially in side elevation and partially in vertical section with the retaining means retracted to a position to permit opening of the gate-like part;

Fig. 5 is a side elevation showing the gate-like part swung into open position;

Fig. 6 is a bottom plan view of the syringe as seen in Fig. 5; and

Fig. 7 is a side elevation of the forward end of the syringe in its open position and with the open sides of the barrel and gate-like part disposed upwardly for receiving the plastic material.

Referring to the drawings the syringe, according to the illustrated embodiment of the invention, comprises a cylindrical barrel 10 provided at its rearward end with a circular grip disc 11, retained by a flanged bearing plug 12 secured in the barrel by set screws 13—13, and having a central cylindrical passage 14 in which the stem 15 of a plunger or piston 16 is slidably engaged, the stem being provided upon its outer end with a knob 17. At its forward end portion the barrel 10 is provided with a cutout 18, extending along the horizontal diametric center line of the barrel and terminating in a concavely curved end wall portion 19, so that the forward end of the barrel is of semi-cylindrical form in cross section and in its open position it presents an open trough-like structure.

A hinge plate 20 is secured by rivets 21 to the upper side of the forward end of the barrel and pivotally supports upon a cross pin 22 a circular head member 23 having a lug portion 24 engaged by the cross pin. The head member corresponds in diameter to the outside diameter of the barrel, and is provided upon its inner side with a reduced plug portion 25 corresponding in diameter to the inside diameter of the barrel, so that in the closed position of the head member it fits within the forward end of the barrel. A nozzle 26 is set in an inclined opening 27 of the head member.

A gate closure member 28 of semi-cylindrical form, having the same cross-sectional diameters as the barrel, is secured at its forward end to the lower side of the plug portion 25 by brazing or the like, and in the closed position engages within the cutout 18 so that the forward end of the barrel 10 constitutes a complete closed cylinder. A locking and handle sleeve 29 is slidably engaged upon the barrel and is of a length slightly less than the distance between the wall 19 of the cutout 18 and the set screws 13, so that in the retracted position, as seen in Figs. 4—7, the gate member 28 is exposed and may be swung to open position. In the closed position as seen in Figs. 1—3, the sleeve 29 is slid forwardly over the gate member 28, being provided at its forward end with a cutout 30 in which the hinge plate 20 is engaged. The rearward portion of the sleeve 29 is knurled or annularly grooved, as at 31, to provide a convenient finger grip, and the fit of the sleeve is a frictional one so that it will remain in either its closed or open position without looseness and may be conveniently slid between these positions by axial pressure exerted thereon.

As seen in Fig. 7, the open syringe presents open ended trough-like structures in both the barrel and the gate member, both disposed upwardly so that the heavy-bodied plastic material may be conveniently placed in both the barrel and the gate member with a spatula or the like. Thereupon the gate member is moved to closed position and the sleeve 29 is slid forwardly into its retaining position where it completely seals the joints between the head 23, the gate member 28 and the barrel, it being pointed out that the length of the sleeve and the depth of the cutout 30 is such that in the forwardly moved position, as seen in Figs. 1—3, the forward end of the sleeve is forwardly of the forward end of the barrel so that it closes the joint between the head and the forward end of the barrel, and the rearward end of the

sleeve is rearwardly of the gate member so that it closes the joint between the gate member and the barrel.

Following ejection of the material, any residue remaining therein that may harden within the syringe is readily removable due to the fact that there are no entrant spaces in which the material may be interlocked, it being pointed out that the type of material employed is such that in its hardened state it will readily disengage from the smooth surfaces of the syringe.

What is claimed is:

1. In a syringe for ejecting plastic material, a barrel including a rearward cylindrical part and a forward semi-cylindrical part having a forward open end and an open side, said rearward part being of greater length than said forward part, bearing means carried by the rearward end of said barrel having a bearing passage extending in the axial direction of said barrel, a plunger slidable in said barrel, a stem connected to said plunger and sidable in said passage; a closure head hinged to said forward open end at a point diametrically opposite said open side, an ejection nozzle carried by said head, said head being movable between an open position exposing said open end and a closed position closing said open end, a semi-cylindrical gate member rigidly carried by and movable with said head adapted in the closed position of said head to close said open side and to form with said forward semi-cylindrical barrel part a forward

cylindrical continuation of said rearward cylindrical barrel part, and a sleeve member slidably engaged upon said barrel of a length greater than said forward semi-cylindrical barrel part and less than said rearward cylindrical barrel part adapted in a rearwardly moved position to be free of said gate member to permit said head and gate member to move to open position and adapted in a forwardly moved position to entirely overlie said gate member to retain said head and gate member in closed position.

2. The invention as defined in claim 1, wherein the periphery of said closure head is circular and of corresponding diameter to the outside diameter of said barrel.

3. The invention as defined in claim 2, further characterized by means limiting the forward movement of said sleeve member to a position in which it projects forwardly beyond the forward open end of said barrel to overlie the periphery of said closure head in the closed position of said closure head.

References Cited in the file of this patent

UNITED STATES PATENTS

1,555,711	Hershinger	Sept. 29, 1925
1,709,445	Tomes	Apr. 16, 1929
1,876,797	Treleven	Sept. 13, 1932
2,692,706	Wiksten	Oct. 26, 1954