March 24, 1959 J. D. SCHWARTZ 2,878,565

DENTAL IMPRESSION TUBE

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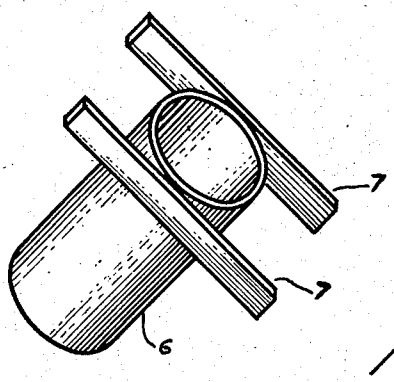

Fig. 1

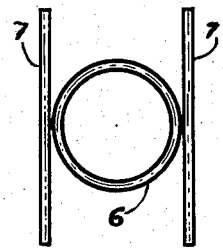

Fig. 2

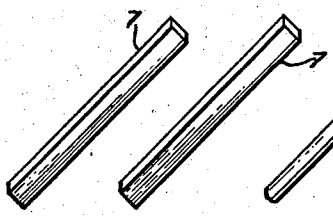

Fig. 3

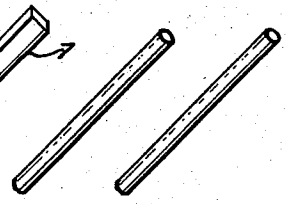

Fig. 4

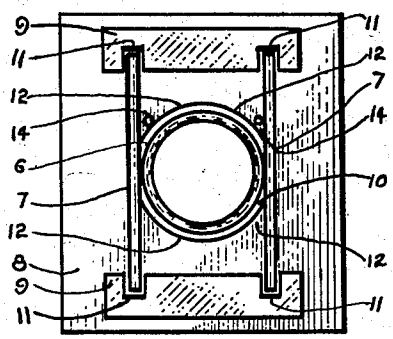

Fig. 5

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DENTAL IMPRESSION TUBE

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6 Claims. (Cl. 32—19)

This invention relates in general to new and useful improvements in a dental impression tube and particularly to the handle thereon.

Most teeth are bulbous in form and besides there are many undercuts in its general configuration. Consequently when an ordinary impression tube, filled with softened impression material, is pressed over a tooth, to form an impression thereof, the soft impression material will flow into the tooth's undercuts, then when the impression material has cooled and hardened therein, it becomes a difficult task to withdraw the impression filled tube from the tooth by grasping the surface of the tube with ones fingers. And quite often the impression is distorted because of the necessary rocking, squeezing and tugging on the tube.

To overcome this difficult, many operators over many years devised and patented handle means on an end area of impression tubes by the use of which, a dentist's fingers may secure a firm grip on the tube and pull it axially, thereby avoiding the rocking necessary otherwise.

Nevertheless while impression tubes provided with handles are very desirable as a labor saving device and more importantly, as means for preventing distortion of a tube impression, they have not come into general and wide spread use by the dental profession. There are two principal reasons for this situation. First, because of the presence of the handle on the outer surface of the tube, it is most difficult if not practically impossible to properly contour a tube with a pair of pliers, to the necessary shape for impressioning a particular tooth. This is the reason. Impression tubes are sold in cylindrical form, but since very few teeth are circular around their crowns, the circular tube must be contoured to accommodate their various shapes. This is done with the use of a pair of pliers, one beak of which is passed through the tube's opening and brought to bear against the inner surface of the tube, and the other beak is brought to bear against the tube's outer surface. But since the handle is on a portion of the outer surface of the tube, the pliers' beak must avoid it lest it be crushed and its usefulness destroyed. Since pliers cannot be used, contouring becomes extremely difficult.

To remedy this shortcoming, the present invention provides a handle on the outer surface of a tube, which comprises two narrow strips of metal, soldered to the tube on one of its ends, at diametrically opposite sides of the tube. Each strip is attached thereto at a point midway between its ends. Each strip runs transversely to the axis of the tube, touching the tube tangentially. That is, it does not extend radially from the outer surface of the tube. Thus the beak of the pliers may contact the entire outer surface of the tube for 360 degrees. Since the outer beak, when it encounters one of the narrow strips of metal, bears against its fiat surface and urges it against the outer surface of the tube. Obviously this will not crush nor destroy the handle's usefulness, as is experienced in other forms.

The second reason for not coming into wide spread use, is the fatal fact of being too costly to produce. An impression tube is used but once and then thrown away, because it is cut to fit an individual tooth. Therefore, its cost must be very low. A few pennies per tube.

In the present invention no expensive dies are necessary, as is the case in other types of handles. In fact, no dies

are necessary at all, since the narrow metal handle strips are cut on a standard cutting machine to proper lengths from a long strip or coil of metal of requisite width and thickness as supplied by a dealer. And their attachment to the tube is done by an ingenious method of mass production which will be explained in detail in the following paragraphs.

Therefore, an object of the present invention is to provide a dental impression tube having a handle thereon, which can be manufactured at a relatively low cost.

Another object is to provide a dental impression tube having a handle thereon, which can be easily contoured to fit the crown of a tooth for impression purposes by use of pliers.

Another object is to provide a method for soldering handles to tubes by mass production procedures.

Another object is to provide handles for impression tubes without the use of costly dies.

These and other objects will be more discernible from the following description and the drawing, in which like reference characters in the various views, represent the same thing and in which, Figure 1 is a perspective view of an impression tube with handle attached, Figure 2 shows a top view of the impression tube with the related position of its straight arms handle, to the tube, Figure 3 shows a pair of flat, narrow, elongated handle arms, Figure 4 shows a pair of round wire handle arms and Figure 5 shows a jig holding an impression tube and two handle arms in related positions prior to being soldered, also shows two small pieces of solder adjacent the joint to be.

Referring now to the drawing, the tube 6 is a standard impression tube. It is shown here as a cylinder, although it may be square, elliptical or any other form, because the tube is seldom used in its original form, it must be contoured to fit a particular tooth. It may be formed of copper or any other suitable metal.

It will be noted that the flat handle arms 7 of the impression tube 6 are very simple in nature and obviously they can be very inexpensively produced. No costly dies are necessary in their production such as is required in any other type. From long strips of metal having the requisite size, as furnished from a dealer, small pieces 7 are cut on a regular cutting machine. They may be formed of any soft pliable metal. In the present invention, the arms 7, may be soldered, riveted or spot welded to the tube 6. Therefore, the means of attachment determines the type of metal to be used for the arms and the tube. In copper tubes the handles may also be copper or any of those nickel alloys which are soft, pliable and solderable. Their width need never be over one-eighth of an inch and a thickness gauge of about 20 is adequate, even when they are formed of soft copper. Their length may be the same for all sizes of tubes or they may be varied. The adequacy of strength of these small arms will be appreciated when it is noted that the force, such as is used by the dentist's fingers in pulling the impression filled tube from a tooth is directed axially of the tube. Hence the force will be across the flat side of the arms, since they lie parallel to the axis of the tube.

The enormous advantages gained by the use of the straight arms handle, as provided in the present invention, over any other type of handle, especially with respect to the cost of production, which cost, as explained above, determines the feasibility and practicability of handle type impression tubes supplanting ordinary tubes in general use, can be gleaned from the following paragraphs.

Impression tubes are necessarily made in various diameter sizes to accommodiate various sizes of teeth. Their lengths, however, are substantially the same in all diameter sizes. The diameters of the tubes range from about ⅛ of an inch to approximately ⅝ of an inch. Therefore, when shaped arms, that is, arms other than straight arms,

are provided for impression tubes, it is necessary that several sizes of shaped arms be provided, to be more or less commensurate with the size of the tube with which it is to be used. This necessitates an expensive die for each size category of tubes. Furthermore, the effort and skill required to solder two small arms to a copper tube, for example of 3/16 of an inch diameter, is relatively enormous. Still further, the solder used in attaching shaped arms to small tubes, invariably flows over the entire arm rather than just at its contact area with the tube. This can be very damaging to the handle. In contrast, to solder a straight arm, as provided in the present invention, to an impression tube having a diameter of 3/16 of an inch is just as easy and simple as soldering it to an impression tube of 5/8 of an inch diameter. This will be explained in the following description of the invention.

A very important part of this invention resides in the discovery that use of straight arms for handles on impression tubes, as provided in this invention, provides the key to mass production and low cost, with respect to soldering the arms to the impression tube. Mass production of this important operation makes possible the low cost which is necessary to make the handle type impression tube replace the plain tube, in general use. The discovery will readily be understood from the following method, which is one practical method. In the jig shown in Figure 5, the metal plate 8 has an opening 10 therein to receive the metal impression tube 6 to its entire length less the width of the handle arm 7. This leaves the end area of the tube 6 exposed on the surface of the plate 8 for attachment thereto of the two arms 7. The metal blocks 9, attached to the surface of the plate 8, have recesses 11 to receive the ends of the arms 7 therein, in a manner which will hold the flat sides of the arms 7 against the tube 6.

It is to be noted here that the straight flat surfaces of the arms 7 contact the outer curved surface of the tube 6 tangentially at their attachment. That is, at a line, or in the case where round wire arms are used, at a point. This form of contact differs from that used where handle arms extend radially from the outer surface of the tube. In those cases the arms usually contact the tube over a surface area rather than at a point or line. In some cases, these arms are made by specially provided dies.

It is also to be noted that this tangential contact creates a substantially V-shape space 12 between an arm 7 and the outer surface of the tube 6 of sufficient size to hold therein a piece of solder 14 of suitable size. Specifically, as shown in the drawing, there are two upper spaces 12 and two lower spaces 12. Into each upper space 12 is placed a small piece of solder 14, preferably lead solder, and a small amount of flux over the joint to be. The entire assembly is then placed into a furnace whose temperature is sufficiently high to melt the solder and cause it to flow into the joint. In the furnace, the plate 8 rests on a base which elevates its upper end about 45 degrees. The reason for the plate 8 assuming this position in the furnace is to allow the small pieces of solder 14, to slide, by gravity, toward the apex of the upper V-shape space 12. Obviously the plate could be positioned vertically with equal results. In a few moments the small pieces of solder will melt and run down by gravity to the contact point between the arm 7 and the outer curved surface of the tube 6 and unite them. The assembly is then removed from the furnace, allowed to cool to room temperature, and the arms 7 will be firmly attached to the impression tube 6. By way of illustration a single tube has been employed. However, a thousand or more arms can be soldered to tubes in the same very brief time it takes to solder one arm. The plate 18 should preferably be stainless steel since lead solder will not readily adhere thereto.

It is at once understandable that the size of the V-shape spaces 12 which are relatively large and therefore adequate to hold the pieces of solder of predetermined size therein, is of extreme importance in making the above

mass production soldering operation possible. Also equally important and responsible for mass production is the use of handle arms which are relatively long and straight such as arms 7, as provided in the present invention. They create the necessary large V-shape spaces.

I have also made and used impression tubes with a single arm and found them satisfactory, especially where the diameter of the tube was very small. I have also made and used impression tubes with arms attached thereto tangentially at the ends of said arms rather than located spaced from both its ends. However, I have found in actual experience that best results are obtained by the use of a plurality of arms attached to the tube at a point located spaced from both ends of the arm.

Having described the invention in one of its preferred embodiments, it being clearly understood that other designs and constructions may be made without departing from the spirit of the invention, I claim:

1. A dental impression device, comprising a metal tube and a handle, attached thereto, said handle comprising a pair of metal bars attached in spaced relation to each other to the outer surface of said tube at one end of said tube, the point of attachment on each of said bars being located spaced from both ends thereof and each of said bars being positioned on said tube transversely to the axis of said tube.

2. A dental impression device, comprising a metal tube, and a handle, attached thereto, said handle comprising a pair of flat, metal strips attached in spaced relation to each other to the outer surface of said tube at one end of said tube, the point of attachment on each strip being on one of its broad surfaces and being located spaced from both ends thereof, each of said strips being positioned on said tube transversely to the axis of said tube.

3. A dental impression device, comprising a metal tube, and a handle, attached thereto, said handle comprising a pair of metal wires attached in spaced relation to each other to the outer surface of said tube at one end of said tube, the point of attachment on each of said wires being located spaced from both ends thereof and each of said wires being positioned on said tube transversely to the axis of said tube.

4. In a dental impression tube of the character described, a handle, said handle comprising a pair of flat metal strips attached in spaced relation to each other to the outer surface of said tube at one end of said tube, the point of attachment on each strip being on one of its broad surfaces and being located spaced from both ends thereof, each of said strips being positioned on said tube transversely to the axis of said tube.

5. In a dentol impression tube of the character described, a handle, said handle comprising an elongated metal bar attached to the outer surface of said tube at one end of said tube, the point of attachment on said bar being located spaced from both ends thereof, said metal bar being positioned on said tube transversely to the axis of said tube.

6. In a dental impression tube comprising a metal tubular body, a handle, said handle comprising at least one flat metal strip attached to the outer surface of said tube at one of its ends, the point of attachment on said flat metal strip being on one of its broad surfaces and being located at one end of said strip, said strip being positioned on said tube transversely to the axis of said tube.

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