

# A simple attachment to the surveyor for effective transfer of path of insertion from diagnostic cast to the working cast

**Suresh Sajjan M C.**

Department of Prosthodontics including Crown and Bridge and Implantology, College of Dental Sciences, Davangere, Karnataka, India

## For correspondence

Suresh Sajjan M C. Professor, Department of Prosthodontics, (Including Crown and Bridge and Implantology), College of Dental Sciences, Davangere - 577 004, Karnataka, India. E-mail: [sureshsajjan@yahoo.com](mailto:sureshsajjan@yahoo.com)

The record of path of insertion on the dental cast is part of the dentist's work authorization to the dental laboratory technician for a removable partial denture. Through the years several methods have been suggested to record and transfer the achieved path of insertion. However apart from traditional tripodding method, most of the newer methods can be effective between any two stages and cannot be used in a universal manner. In this article a simple attachment to the surveyor is explained which can make the recording and transfer easy and repeatable at all situations.

**Key words:** Removable partial denture, surveyor attachment, tripodder, tripodding

Determining the path of insertion is one of the crucial events in planning removable partial denture. The determined path of insertion has to be meticulously recorded on the study model, in order to transfer onto the master cast or working cast, so as to enable the dental technician to re position the cast on the surveyor that the dentist has selected.

To record the path of insertion many methods have been suggested.<sup>[1]</sup> The accepted methods of recording are (a) tripod marks on the anatomic areas, (b) vertical lines on the side of the base of cast, (c) three widely separated marks on the sides of base of cast, (d) a pin cemented in the centre of the cast, (e) use of protractor fixed on and recording the angles of selected points,<sup>[2]</sup> (f) use of dental bur in place of pin,<sup>[3]</sup> (g) use of position recorder device on a surveyor,<sup>[4]</sup> (h) use of plastic plate and impression of cusp tip<sup>[5]</sup> (i) device with adjustable arms,<sup>[6]</sup> (j) use of plastic tray and impression<sup>[7]</sup> (k) smooth or threaded pin with sleeve,<sup>[8]</sup> (l) use of inclinometer<sup>[9]</sup> and (m) Key and Key-way system.

Although none were commented as having disadvantages as well as most accurate, they all depend on the accurate markings or cumbersome procedures on the cast. Tripodding (marks on the anatomic areas) is the simplest of the methods used to transfer the path from diagnostic to master cast.<sup>[1]</sup> One main limitation of the tripodding is, that the operator has less control on the selection of points. Use of this instrument can give the operator a full liberty to choose the widespread points.

## The tripodder attachment

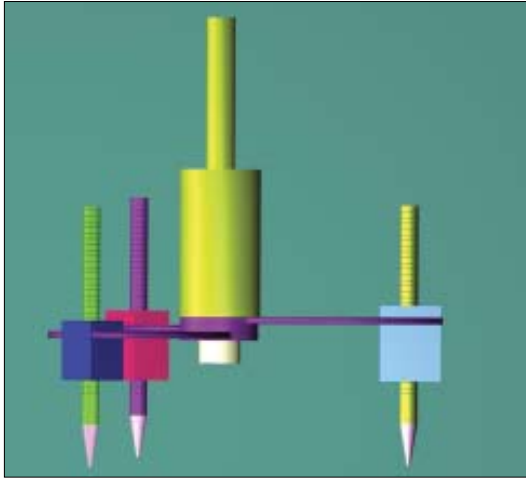
An attachment has been designed to record and transfer the path of insertion [Figure 1]. The Tripodder is having three graduated (mm) pointers, which can move freely vertically, in a sleeve and can be locked at any height by tightening the thumbscrew. The sleeves can move horizontally along the track on the blade. The three blades are attached to a central shaft, which allows for rotational movement. The sleeves of all the three pointers are milled to be in the same horizontal plane. The total assembly can be mounted on to the tool holder of any surveyor [Figure 2].

## Method to record the path of insertion

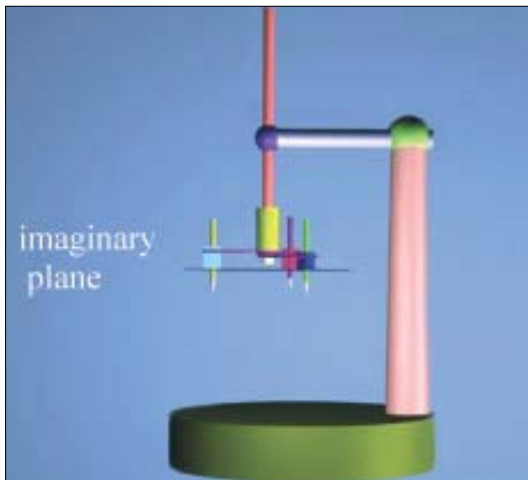
1. Mount the cast on the cast holder and determine the suitable path of insertion using conventional methods.
2. Select three widely separated points on the cast. Care is taken to select the points, which will not be altered during mouth preparation. It can be cusp tip or fossae.
3. Mount the tripodder instrument to the tool holder of the dental cast surveyor and bring down the instrument about 2 cm from the cast.
4. Now bring the three pointers in contact to the selected points respectively. Note down the reading on the pointers [Figure 3].
5. The readings may be noted on the base of the cast.

## Method to remount the master cast

1. Transfer the markings from the diagnostic cast to



**Figure 1:** Graphical model of the Tripoder attachment. Graduated rods can be moved vertically in the sleeve, and horizontally along the arms/blades. The arms can rotate along the central shaft



**Figure 2:** Graphical model of the attachment mounted on the surveyor representing the shift of the imaginary plane from the cast to the surveyor



**Figure 3:** The Tripoder attachment mounted on surveyor and positioned on cast

5. Use of this instrument can eliminate many errors that may happen during lab authorization.

## DISCUSSION

Wagner<sup>[1]</sup> studied the convenience and time required to use these methods. The marking on the base of the cast was found to be more time consuming than others. Dumbrigue<sup>[10]</sup> also compared the different methods to reorient the casts along with his own introduced inclinometer technique. He found that the inclinometer results in a faster reorientation and next best was the traditional tripodding. Tripodding method is the simplest and traditionally used for recording the final orientation of the cast on the surveyor. It uses an analyzing rod or the carbon marker to locate and mark three points on the prominent areas of the cast. All these points should be in a single plane. The main disadvantage of the traditional method is that the location of these points should be at a single plane. After determining the path of insertion the cusp tips may not be located at a single imaginary plane so as to use them for tripod marking. In the present method of using the attachment (tripoder) this imaginary plane is shifted from the cast as a definitive plane on the instrument, as all the sleeves are milled to have their lower surface at a single plane. This permits the user a liberty to choose the points anywhere in the arch and not necessarily on the cusp tips but also on the cusp fossae. With certain modifications this can also be used for simultaneous analyzing of multiple surfaces of the teeth to determine the path of insertion, etc.

master cast.

2. Arrange the tripod vertical rods with the respective readings as noted on the base of the cast.
3. Position the cast on the cast holder without locking and bring down the tripod so that the pointers come in contact on the markings simultaneously and the cast gets repositioned automatically to the previously selected path [Figure 3].
4. Lock the cast holder in position and it is ready with the predetermined path of insertion to carry on with the work.

## Advantages

1. Freedom to select the points, which need not be present in a single plane.
2. Easy and less time consuming for reorientation.
3. Accurate lab authorization.
4. Can also be used to assess the path of insertion if measuring rods are replaced with analyzing rods.

## SUMMARY AND CONCLUSION

A simple attachment to the surveyor is explained which can simplify the recording of the path of insertion and procedure of reorienting the working cast/mastercast.

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