

# WELDING WITHOUT STRESS

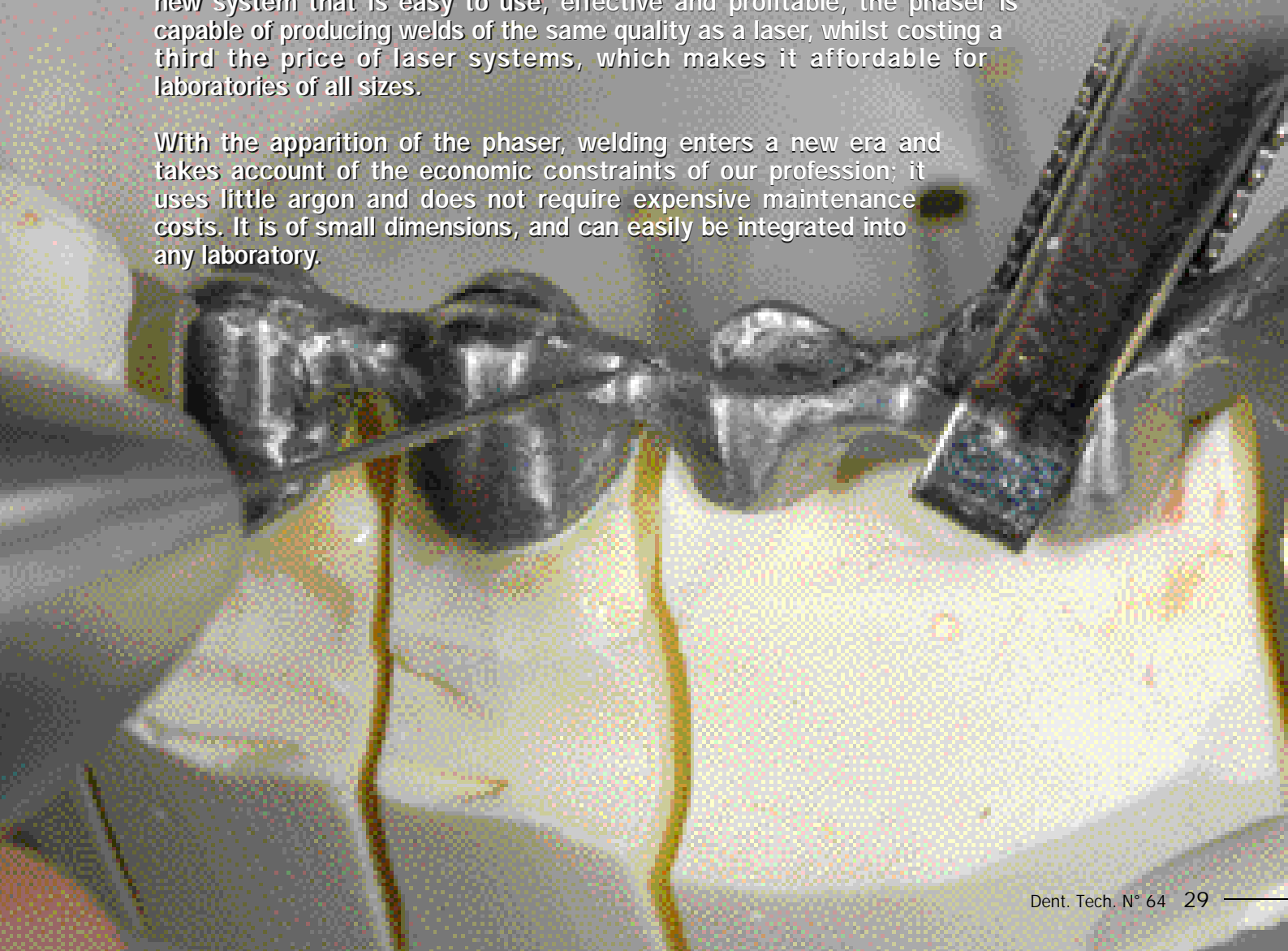
## Is possible with the PRIMOTEC PHASER mx1 !!!!

In all laboratories technicians are confronted with the tiresome realities of soldering; factors such as coarse grain investing, the protection of surrounding surfaces, and risks of deformation can be stressful.

Admittedly, the introduction of laser systems opened up new prospects for welding, but unfortunately the cost of a system featuring this type of technology placed it out of reach for small businesses...

Primotec Phaser appeared at the IDS 2003 revolutionizing the domain. A new system that is easy to use, effective and profitable, the phaser is capable of producing welds of the same quality as a laser, whilst costing a third the price of laser systems, which makes it affordable for laboratories of all sizes.

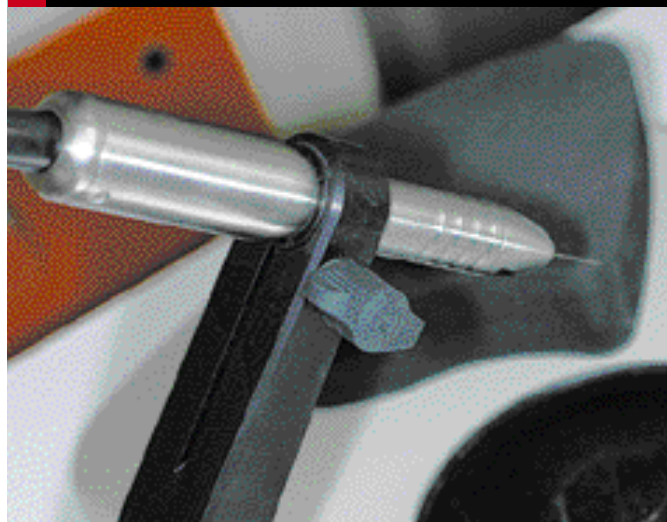
With the apparition of the phaser, welding enters a new era and takes account of the economic constraints of our profession; it uses little argon and does not require expensive maintenance costs. It is of small dimensions, and can easily be integrated into any laboratory.



**1** The electric generator with various programs (determined by the power and pulse needed for alloys).



**2** The stylet on its support with tungsten needle.



## A SIMPLE AND FUNCTIONAL APPARATUS

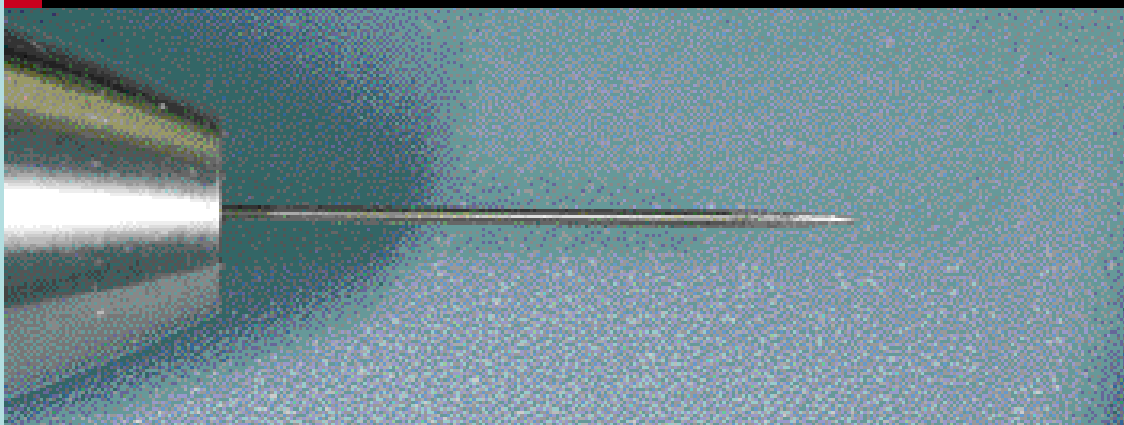
### *The Central Processing Unit*

The central processing unit is a simple but functional apparatus. It is not just an electric generator (fig. 1), it is above all the central point of electronic management of the phaser. The frontage design is practical and features the essential. The central processing unit offers 5 basic programs:

- AU : gold and precious alloys
- CRCO : chromium plated cobalt
- HYBRID : hybrid weldings such as gold-crco
- TITAN : titanium
- ORTHO : orthodontics

The duration and intensity of the electric pulse can be recalibrated according to the required level of impact; the technician simply touches the keys, and his actions are shown by luminous indicators. The argon projection and pulse are modified according to the selected duration and power level.

**3** Tungsten needle.



**4** The microscope (can be replaced by a magnifying glass for tighter budgets).



**5** Argon regulated at 4 kg.



## Not just another stylet

The hand set (fig. 2) is more than “just another welding stylet”: it is technological innovation. Use it on its support stand, which can be directed as required, or simply by hand. In either case the technician works directly on the master-model: the days of coarse grain investment and work on welding models are over. The stylet tip is a retractile tungsten electrode (fig. 3). Contact between the electrode and the element to be welded sends a signal to the central processing unit, which releases a jet of argon. The jet passes directly through the hand set, thereby protecting the surfaces to be welded with gas. At the time of impact, the electrode retracts slightly allowing the pulse to create an electric arc. This characteristic, unique to the phaser, makes it possible to obtain oxide-free welding points, since when the electric arc is created, there is no contact between the electrode and the metal. It is thanks to this particularity that the argon consumption (which is located at 4l/min) is 4 times less than a box and pedal system. The electrode can be sharpened by diamond disc with no trouble, it is easily interchangeable and its cost is reasonable.

## Visualize the heart of the matter

Thanks to the stereo microscope zoom, which can enlarge from 4 to 20 times, (fig. 4), the technician can get to the heart of the matter, visualize the area requiring intervention and control the quality of the welding in a very precise way. On the safety side of things, the microscope is equipped with an electronic obturator: the LCD shutter. The principle is simple; when a pulse is released, the shutter seals the objective, thus protecting the eye. The system is removable, so it can be used to stereo microscope other work. Alternatively, a 3 diopters magnifying glass, or a static stereo microscope (10 X magnifier) can be combined with the central processing unit for tighter budgets.

## The pressure reducer

Specifically devised to optimize the use of Phaser MX1, the pressure reducer has 2 gauges, namely pressure and flow (volume/litre). It can easily connected to the argon bottle (fig. 5).

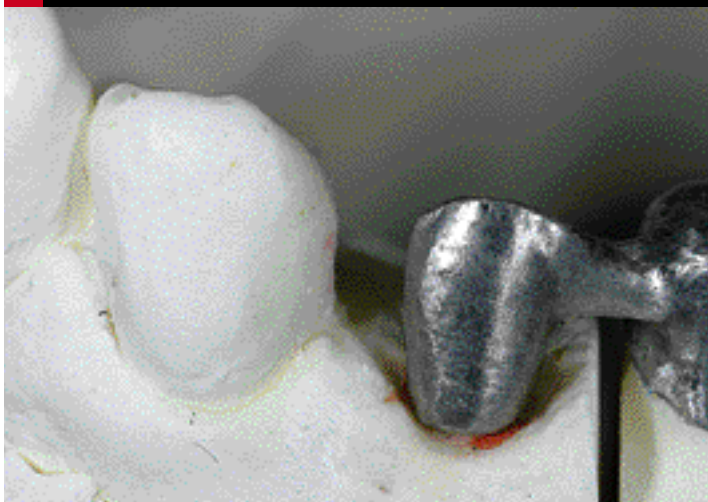
## PRACTICAL APPLICATIONS

This apparatus combines many qualities, showing versatility and an astonishing adaptability to all fields of dental

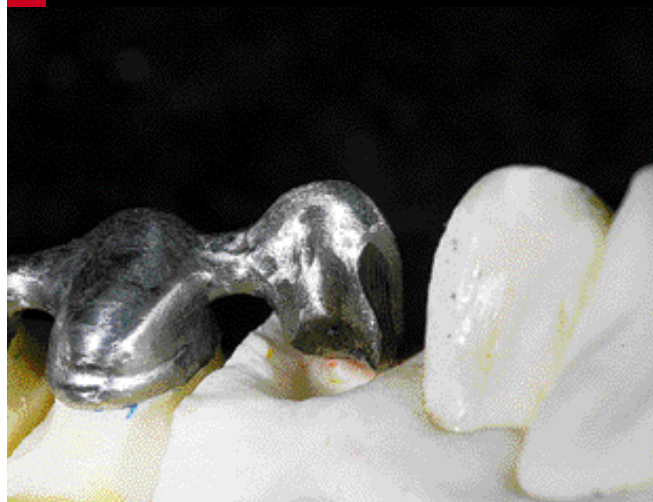
You can weld any type of alloy, whether precious or non-precious, as well as titanium, metal removables, crown and bridge and even orthodontics.



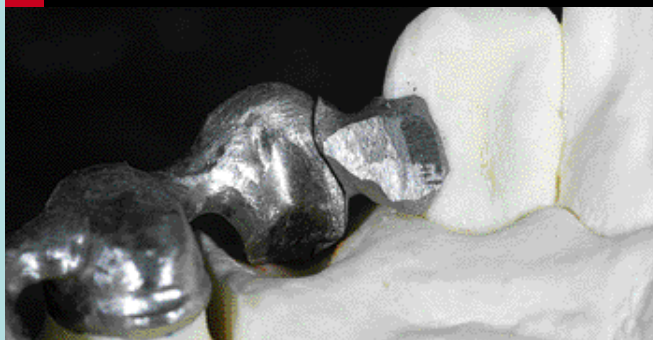
**6** A retaining pin was forgotten on 12.



**7** A groove is prepared on the pontic.



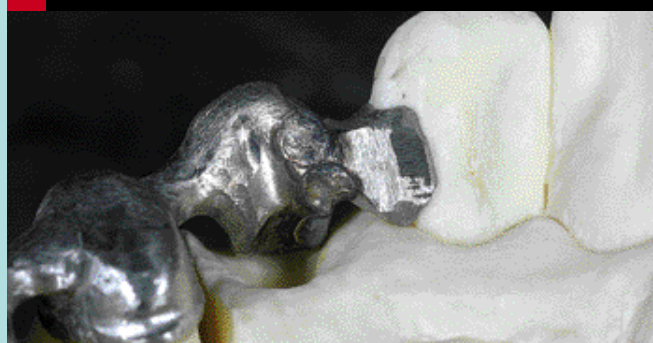
**8** After casting the Oblock is positioned on the model.



**9** Welding directly on the model with buccal view.



**10** Palatal view.



**11** Grinding...



**12** ... And finished aspect.



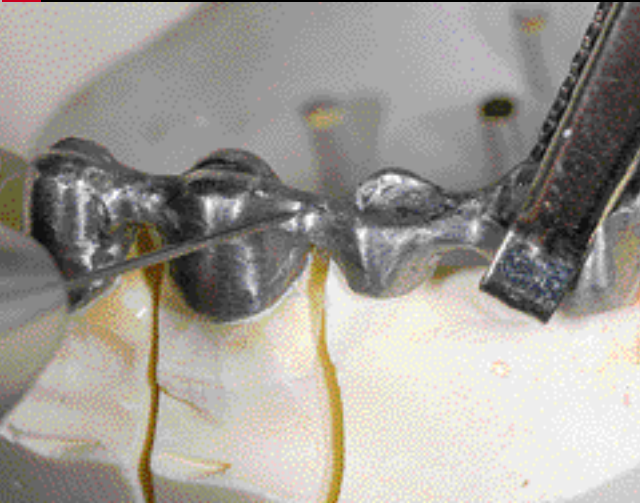
technology. Because of the specificity of the basic programs, it can be used in the domains of orthodontics, metal removables, prothesis combined with attachments, and in metallic crown and bridge work.

As a specialist in crown and bridge, I use the phaser in various situations:

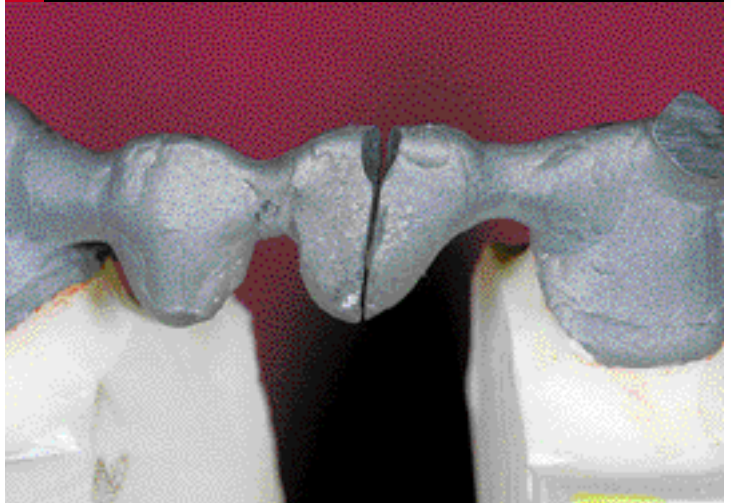
- To create the passivity of wide ranging bridges by modelling several parts which will be welded together afterwards: this means no more soldering worries when carrying out successive ceramisations.
- As an easy, stress free remedy for running and investment



**13** Bridge ready to be welded.



**14** Cut at the thickest part of the canal.



problems such as porosity, withdrawal or lack of metal.  
- For quick intervention in order to add a retaining peg (figs. 6 to 12).

## HANDLING

Handling is relatively simple, elements to be welded are placed on the master-model. The crocodile clip is attached to one of the parts to be welded, in this case a bridge (fig. 13), all that is left to do is to put the electrode in contact (without pressing) with the exact place where one wishes to weld. The argon projection passes through the hand set; protecting the surfaces to be welded with gas, the electrode retracts and the pulse creates an electric arc. The operation can be done as many times as is necessary. Contrary to laser, which proceeds in a continuous and linear way, this system makes it possible to weld in an alternative way, point by point, thus avoiding the overheating of alloy and its potential deformation.

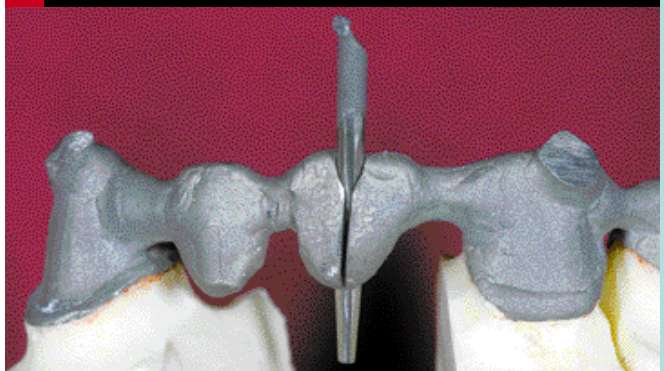
## PRACTICAL ADVICE

### *On a bridge*

It is preferable to weld onto the pontic. You have a greater surface to weld, therefore a greater solidity. For maximum reliability, proceed as follows: cut the bridge with a superfine disc. At the place of the incision, prepare a groove to a thickness that enables you to insert a stem made of the same alloy as the bridge. Once this is done, the model will be ready for welding. Be careful, placing a stem through the bridge can create tension if you force it, which could distort fitting.

The welding will be carried out around this key, creating a homogeneous and solid unit (figs. 14 to 19).

**15** The key is slipped into the groove in the canal.



**16** Welding around the key.



**17** When completely welded on both sides, cut the key.





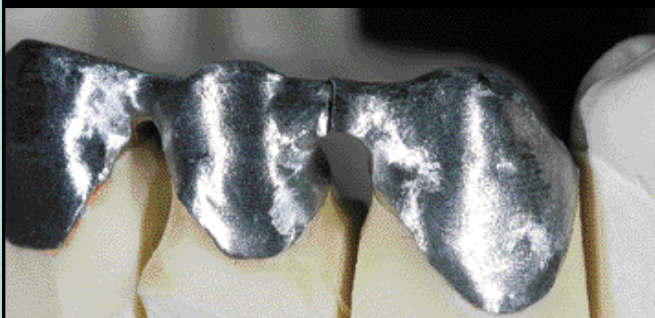
**18** The welding on both sides is invisible.



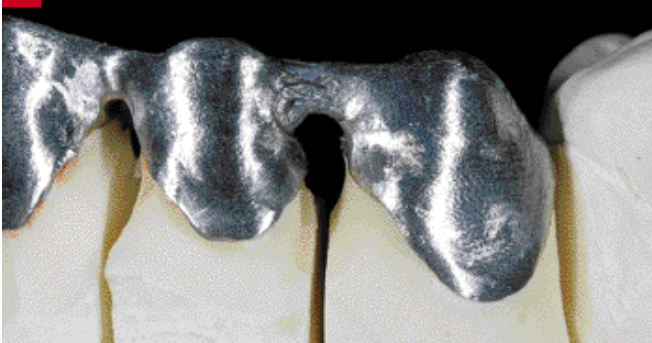
**19** Preparation for the welding of a bridge adjusted on the model (rocking). A groove was cut in the centre of a pontic, and a key of the same alloy slipped into it, then welded.



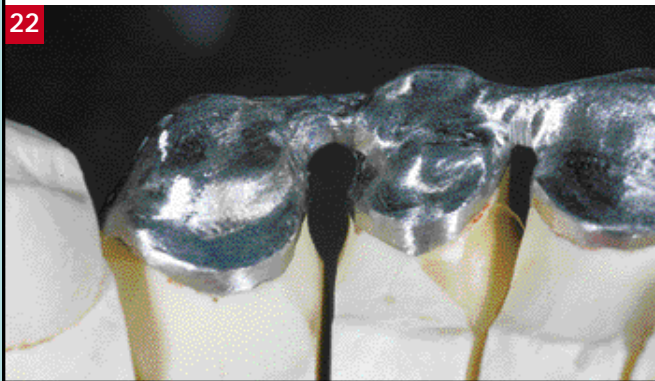
**20** Figures 20 to 24: Direct welding on NiCrBe, the welding is carried out, and the piece is trimmed.



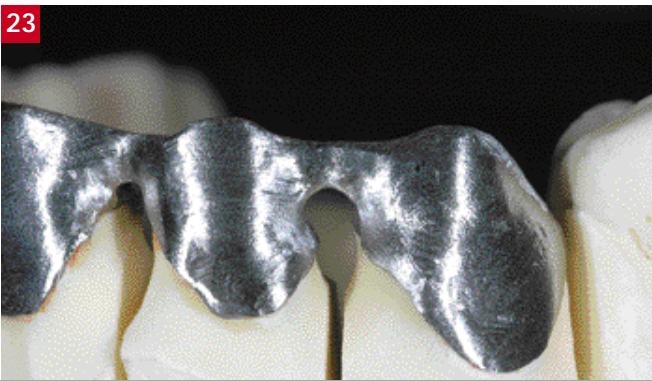
**21**



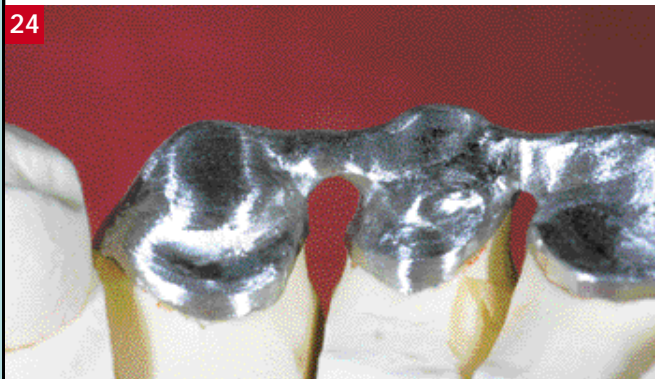
**22**



**23**



**24**

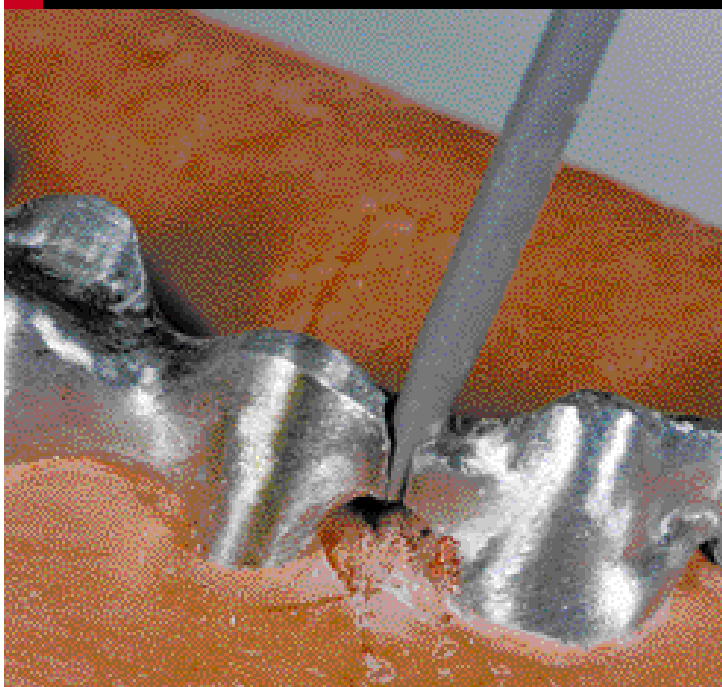


If you wish to weld at a connector, proceed in the same manner. It is possible to weld without a stem, but this is not advised, as you lose the extra metal.

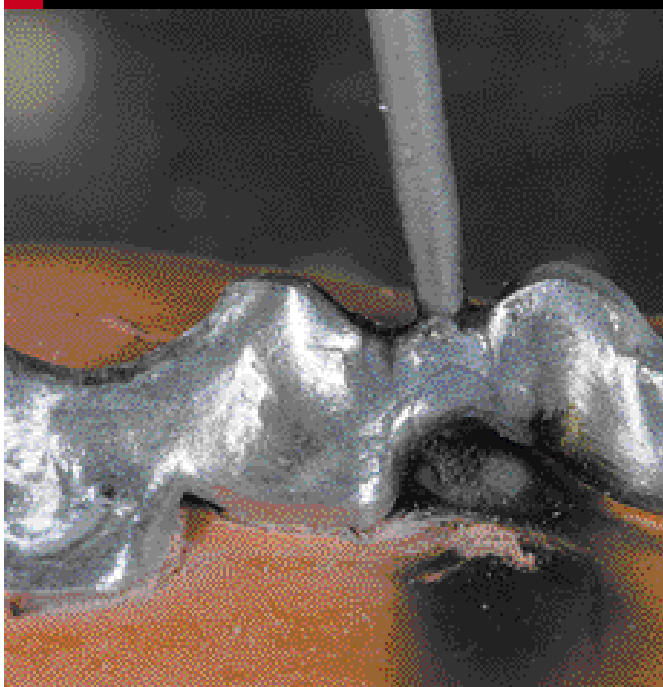
## *Welding bridges in several parts or coping together (figs. 20 to 24).*

Placing the crocodile clip and holding the coping together whilst welding sounds like some kind of gymnastic feat. In fact, all you have to do is proceed as above. Position the elements to be welded onto the master-model and join them two by two, spot welding 2

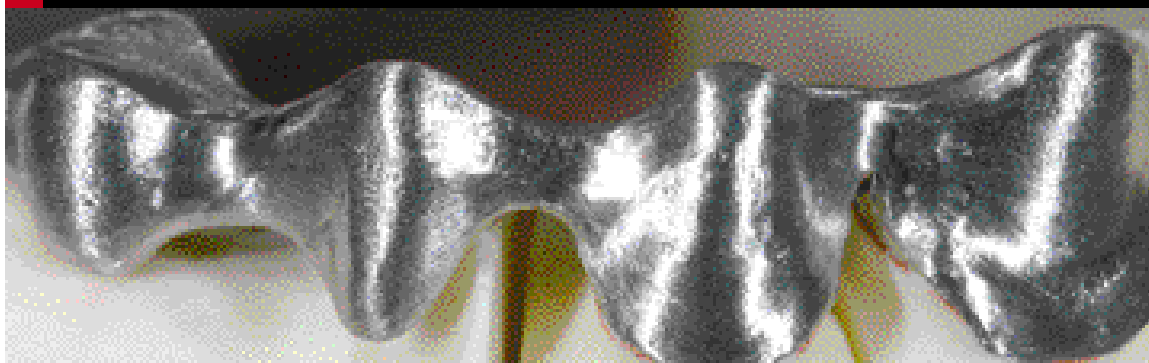
25 Total welding.



26 Welding at the thickest part of the pontic.



27 Reintegration on the work model.



or 3 points for each joint, and taking care to check the positioning regularly. After checking, if the bridge or the copings are correctly joined in place by the first welding, continue welding work on the other side of the model (figs. 25 to 27). It is in this kind of situation that the ease of use and effectiveness of the apparatus comes to light.

## USEFUL IN ALL AREAS

The photographs clearly illustrate the numerous possibilities offered by this welding machine. In addition to my own experience, tests carried out in Germany have proven the reliability and quality of the result obtained.

This apparatus can be used in all the areas of a technician's work, from simple repairs to combined work or complex implant work; it is a real laboratory assistant!

The concept of plasma welding using an electric micro-pulse phaser is much more than a simple alternative to laser, it is a universally recognized innovation. ♦

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Remi Desprez  
Dental Technician