

Gnathojust Quadrant Simultray

An ergonomic quadrant double arch impression system



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Introduction

Other than full arch impressions, partial impressions are made most frequently. Their main disadvantage up to now has been the impossibility to profit from all the advantages of a fully adjustable articulator during the laboratory phase.

Attempts to orient the upper partial model, for example, with a facebow transfer often fail due to missing cross-arch stability.

Similar difficulties arise when a separate centric bite registration is used to orient the interarch relation of partial models.

Partial double arch impressions, made with a closed mouth technic have been made for a long time. Using different occlusal carriers, attempts were made to obtain not only a suitable impression of the prepared teeth and the opposite arch, but also a correct interarch registration. Due to the thickness of these carriers, which vary according to Woelfel! between 17 microns and 230 microns, different reflexes are stimulated.

The reflexes lead to occlusal errors (Christensen phenomena) and absolutely undesired masticatory movements which destroy the accuracy of the impression, particularly in the gingival area.

Other errors are introduced unavoidably in the laboratory as the models obtained from these double arch impressions cannot be mounted on a correct articulator but only on an occludor or similar instrument.

Occludors can by no means simulate the geometric facts of the gnathic system. The introduction of positive and negative errors, as shown by Hobo?, into the prosthetic work is guaranteed necessitating time and effort by the dentist to correct them in the patient's mouth.



Fig. 1
 Simultray Safident
 CH-1196 Gland.



Fig. 2
 Simultray inserted for
 occlusal adaptation.

The Simultray, double arch impression tray system

It is based on the Gnathojust centric bite registration technic³.

Due to the thickness of the impression material carrier, identical to the Gnathojust centric bite carrier which measures only 4 microns, the patient's reflexes are not stimulated. No undesired jaw displacement movement or mastication can be produced by the Simultray (Fig. 1).

Splits in the occlusal membrane allow pressure exchanges by material flow immediately after the placement of the loaded Simultray.

Large lateral wings have been added to the carriers buccal and lingual parts. They help when removing the impression from the patient's mouth. They also allow the orientation of the completed double arch impression in the special mounting platform for the articulator mounting. A correct geometric orientation is possible.

The positive and negative errors due to wrong distances between the dies and the rotation centers can be eliminated.

Clinical application

The empty Simultray is placed in the patients mouth. The free passage in the retromolar area of the posterior connector is controlled (Fig. 2).

By several slow mastication movements, the patient adapts the stretchable occlusion carrier to his occlusion.

After removal of the Simultray from the patients mouth, Kerr Boxing Wax strips are pressed onto the inferior sides of

the lateral wings of the Simultray (Fig. 3).



Fig. 3. Simultray with Kerr Boxing Wax strips.

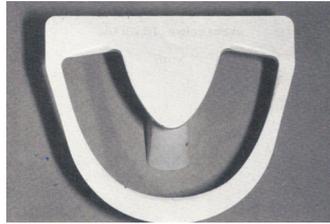


Fig. 4. The Simultray articulator mounting platform.

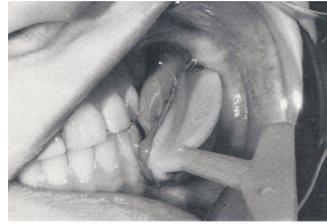


Fig. 5. The loaded Simultray inserted with Impregum / Espe.



Fig. 6. Addition of syringe material to the mesial side of the Simultray for later control of the disclusion.

These strips will keep the lower corners between the vertical impression tray wall and the sidewings partly free from impression material. This will greatly facilitate the orientation of the Simultray in the platform (Fig. 4).

Normally no impression material adhesive is used. The half-spherelike retentions in the impression tray wall are adequate. If an adhesive is used, it must be placed only on the sidewalls and by no means onto the ultrafine foil, otherwise the thickness will be altered.

The Simultray is filled but not overfilled with impression material on both sides of the bite carrier.

Syringe material is placed, as usual, carefully onto the preparations.



Fig. 7. Removal of Simultray by downward finger pressure on the exterior sidewings.



Fig. 8. Simultray in traystand according to Saur.

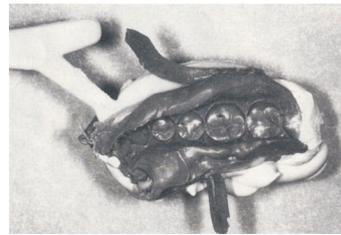


Fig. 9. Removal of boxing wax from lower surface of sidewings.



Fig. 10. Upper arch model connected to mounting plate.

The Simultray is then inserted in the patient's mouth (Fig. 5). The patient must close slowly and the bite must be checked on the opposite side.

Whenever possible, the cuspid area should be included in the impression for the control of the disclusion. If necessary, remaining syringe material is added mesially to the Simultray (Fig. 6).

After setting of the impression material, the Simultray must not be removed by a pull on the handle, but by careful finger pressure first onto the outside and then the inside lateral wings (Fig. 7).

Laboratory procedure

Tests have shown that independently prepared teeth located in the impression of the upper arch should always be cast first. If the preparations are in that arch, dowel-pins are set and the primary cast poured. To allow unrestricted hardening of the stone, the Simultray is placed in the traystand (fig. 8).

After the isolation with Kerr supersep and the setting of the second layer of stone in the traystand, the lower surface of the sidewings are completely freed. The boxing wax strips are removed, the rests of impression material are either cut or drilled away (fig. 9).

Now the Simultray is: placed on the platform and connected to the upper mounting plate of an adjustable articulator (fig. 10).

Only at this moment is the lower arch cast poured. Care is taken to cut off possible dowel pin parts, which have passed the occlusion.

After the connection of the partial lower cast to the mounting plate, we now have geometrically, correctly oriented casts.

This allows inclusion of the Bennett angle, the Bennett movement, and the condylar inclination effects into the prosthetic work in the wax-up. The disclusion can be verified and working interferences avoided.

Sumari

A new type of double arch impression system not only allows to register centric occlusion correctly and to make precise impressions even in the gingival area, but it also makes a geometrically correct mounting of partial models on

an adjustable articulator possible.

Without special effort, superior quality prosthetic work is feasible.

The system is particularly useful for inlays, onlays, and single crowns, and also for short-span fixed bridge work in the posterior area with reduced adjustment time at chairside.

References

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The Simultray double arch impression system

Ergonomic for the dentist:	Saves time, impression and bite registration material.
Pleasant for the patient:	Hygienic security, considerable reduction of vomiting reflexes.
Handy for the technician:	Possibility to mount partial double bite impressions onto an adjustable articulator and not only onto occludors. Easy to remove impression tray from models even if hard material was used.

The Simultray Impression Trays allow to copy precisely the preparations and the opposing teeth simultaneously. In addition the centric occlusion is registered at the patients exact vertical dimension. This without chewing movements which deform the impression and which occur whenever in occlusion the presence of a resistant substance is registered. No need to maintain the impression tray while the impression material is setting.

The ultrafine extendable Gnathojust bite carrier avoids also undesired reflexes like the Christensen phenomena. Vomiting reflexes even in case of high sensitivity do not occur.

The large lateral wings of the double arch tray allow in the laboratory the use of the Simultray Platform which permits to articulate the partial arch models in an anatomically correct articulator. The blue platform is to be used with the Dentatus and Hanau, the grey with FAG, SAM, WHIP MIX articulator.

The Simultray are rapidly removed from the hardened models by tearing the thin occlusal carrier. The risk of fracturing dies is minimal.

Without an additional effort, the technician can incorporate in his work the Bennett angle, the Bennett movement (sideshift), the condylar inclination and can check the disclusion and avoid the negativ and positiv errors. These errors are resulting from the completely wrong geometrics of occludors.

The normally almost always necessary selective grinding at the chair by the dentist of prothetic work made by this method is minimal.

Field of application: impression taking

In case of acceptable occlusion, when no prior selectiv grinding is necessary, the Simultray System is ideal for inlays, onlays, crowns and small fixed bridgework.

Recommadations for the dentist:

1. Prior to the impression taking the Simultray, bite carrier must be stretched in the patients mouth by several slow biting movements. The distal connecting bar of the quadrant Simultrays must be placed into the retromolar space out of occlusion.
2. On the lower surfaces of the lateral wings by simple finger pressure either boxing wax sticks/Kerr or ropes of window dough must be added. This facilitates the laboratory mounting of the models with the Simultray Platform.
3. If for better adhesion of the impression material on the Simultray an adhesive is being used (f.e. for Impregum/Espe this is not necessary) it must only be added to the sidewalls and not onto the carrier.

4. A stiff impression material like IMPREGUM/ESPE or BLU MOUSSE/PARKELL should be used.
5. The Simultray is filled but not overfilled on both sides of the carrier.
6. The syringe material is placed with care onto the preparations.
7. The filled Simultray is placed in the mouth and the patient is asked to close slowly. Check bite.
8. The remaining syringe material is added on the mesial side of the Quadrant.
This is to include whenever possible the canin region for disclusion control.
9. After the impression material has set, do not remove the Simultray by pulling on its handle, but facilitate by pressure with the index onto the outer lateral wing of the patient to open his mouth.

Recommandation for the technician

1. Independent if the preparations are in the upper or lower impression part, the upper arch model is always cast and articulated first. Direct dowel pins are used preferably. To start only the ones placed in the upper arch.
2. During the setting of the upper model, the Simultray should be placed in an impression tray stand to allow an unrestrained setting.
3. The boxing wax strips or the window dough placed by the dentist onto the lower surface of the sidewings are removed. All the lower side of the sidewings remaining impression material is either out or drilled away.
4. The Simultray with only the upper model cast is now placed onto the Platform, care is taken that the sidewings lay well. Now the maxillary model is mounted to the upper mounting plate of an adjustable articulator.
5. The Platform is removed, passing through direct pin parts are cut off.
6. The mandibular impression part is cast and after setting fixed to the lower mounting plate.
7. Remove the Simultray and the impression material.
8. Set the adjustable articulator: Bennett angle, Bennett movement, condylar inclination, incisal guidance, check disclusion.

Other fields of application:

1. Centric and opposite bite registration

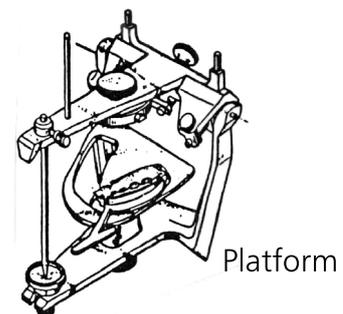
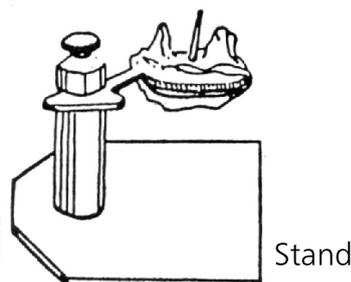
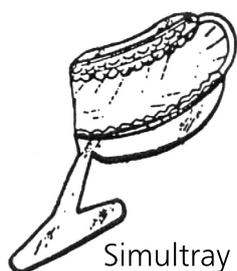
In case a full mouth hydrocolloid impression or similar is taken with the Simultray, an excellent impression of the opposite arch, far superior to an ordinary alginate, can be made. This simultaneously with the registration of the centric at the patients right vertical dimensions (see also: centric bite registration with the Gnathojust System).

2. Fabrication of direct acrylic temporaries

Before local anesthesia is given, missing teeth or parts of it are added in soft wax and the occlusion checked. a Simultray impression is taken as described before. The adding of boxing wax strips or window dough is unnecessary. The placement of several (4-6, rarely more) occlusion disclosing strips in the central incisor area is recommended. They will increase the thickness of impression material in the occlusion area. This avoids possible tearing in that region and allows a remake of the temporary on a later date.

After the finishing of the preparations the Simultray filled with autopolymerizing acrylic is repositioned without problem. Its hardening takes place without distortion creating a precise copy of the occlusion by bite pressure without any help.

The same Simultray impression isolated and filled with melted casting wax, placed onto the isolated and waxed covered dies of the working model reduces the laboratory working time and simplifies the wax up.



Gnathojust front and complete doublebite impression

Recommandation for use

1. Functional analysis

First a bucal wall and a palatine lingual stop is placed on the frame respectively on the foil of an orange or white Gnathojust bitecarrier, which is otherwise used for centric registration.

The prior determined minimal number of occlusion separation leafs, which prevent any posterior tooth contact, is placed into the slot of the bucal wall under the handle.

Before impression material is placed on both sides of the carrier, the impression system is placed for a short time in the patient's mouth for acquaintance taking.

After covering the occlusion of the teeth with syringe material, the well filled up Gnathojust impression tray is inserted in the mouth for acquaintance taking.

After covering the occlusion of the teeth with syringe material, the well filled up Gnathoujust impression tray is inserted in the mouth. The patient is instructed to bite onto his posterior teeth. The occlusion separation foils serve as a "jig" which helps to find a better bilateral condylar position. This in respect to the first interferences on a vertical dimension, which has only slightly increased.

After the set of the impression material the special bite fork is screwed to the handle.

The facebow, attached then to the connection fork carrier, is unscrewed and the Facebow and fork is lifted off.

Afterwards the complete double bite is removed. Bilateral pressure with the indexes onto the maxillary borders facilitates the patient to reopen his mouth.

Good results are obtained with impression pastes unosil-s/ de trey, impregum F/espe, mirror/kerr, blue mousse/parkell.

Experience has shown that (if necessary) missing impression parts can be added with these materials. In such a case, after the removal of indercuts f.e. Under bridges, the double bite impression with the fresh material is reinserted and the patient instructed to bite again.

2. Impression for working model

After the preparation of the Gnathojust bitecarrier with a bucal wall and a palatine-lingual stop, the whole tray is inserted in the mouth and the patient instructed to bite slowly in order to adapt the thin carrier to the effective occlusion.

In case adhesive is being used, it must not be placed on the Gnathojust carrier, only on the bucal wall. Experience has shown that the use of adhesiv is practically never necessary.

The impression is made on the correct vertical if only one master model will be made. If several models are to be cast from the same impression, the vertical dimension is increased in order to obtain a thicker impression layer in the occlusal area of unprepared teeth. For this purpose 10-15 occlusion separation foils are inserted. This helps to avoid the tearing of the otherwise thin occlusal impression part, when the cast is lifted off.

In case the preparations are in the front and the impression is being made with occlusion separation foils, it is important that sufficient impression material is placed onto the lower teeth prior to the insertion of the impression system.

3. The fabrication of acrylic temporaries in the front or of long length

In case a wax up has been made on the studycasts, a Gnathojust double bite impression is taken on a slightly increased vertical dimension of the articulator. If only the actual form of the teeth should be copied, a preliminary double bite is made in the mouth with occlusion separation foils inserted.

Once the preparations are finished, the preliminary impression is filled with selfcuring resin and reinforced with Safitex (Kevlar fibers).

After the reinsertion of the filled impression the patient is instructed to close as hard as possible. This allows to fabricate temporaries which correspond either to the waxup or to the situation at the start and which have only minimal distorsions. The thin pressure leaf is easy to remove, the gingival borders hardly change and the occlusion in most cases is acceptable with minimal corrections.

This preliminary impression allows not only, if necessary, to remake the temporaries f.e. After partial extraction healing or in case of periodontal problems with tissue loss, but it makes it also possible - after isolation and fill up with fluid casting wax - to make on the master model fast a precise wax-copy. This is for the laboratory technician an enormous time safer and facilitates the incorporation of the prosthetic

Work in the mouth, as it will not be overcontoured.