Title: DEVICE FOR PLACING DENTAL IMPLANTS

Abstract: Device for placing dental implants, which device comprises one or several ducts (6) for guiding one or several drills for applying one or several osteotomies in a bone structure (13) of a patient and/or for guiding the insertion of one or more implants, characterised in that at least for one of the ducts (6), an opening (7) is provided that allows the surgeon to access or inspect the bone structure (13) at the point where, and at the time that a drill and/or an implant enters the bone structure (13).
Device for placing dental implants.

TECHNICAL FIELD OF THE INVENTION.

The present invention relates to a device for placing dental implants.

More particularly, the invention relates to a device used during the surgical procedure of placing dental implants.

BACKGROUND OF THE INVENTION

It is a known practice to replace missing teeth or a seriously deteriorated denture for esthetic or for therapeutic reasons.

Although the majority of dental prostheses are borne by neighboring tooth or by tissue, an increasing amount of prosthesis are anchored in the mandible, the maxilla, the palate of the patient or even in more distant bones such as the zygomatic bone, or bone structures attached to the skull base, by way of one or more implants screwed into holes drilled in the bony tissue, the so called osteotomies.

The surgical procedure and the placement of such anchored prostheses is usually prepared and supported by a tailor made guide template, a shaped element to be placed in the mouth of the patient during the operation, which element guides the drills with respect to their position and orientation.
The use of such a guide template improves the predictability of the implant surgery and the aesthetic result and decreases the risk of post-operative complications.

The preparation of the surgical procedure and also the production of the guide template usually makes use of medical imaging techniques and 3D printing techniques such as stereolithographic modeling.

During the surgical operation, in case the guide template is made to be supported by the bone, first a ridge incision is made and the mucoperiosteal flaps are raised to free the bone surface.

The guide template is positioned on the bone surface in a stable position, and is usually fixed to the bone structure by means of so-called osseo-synthesis fixation screws or rigid fixation pins.

Thereafter, the osteotomies are drilled, often in various steps with increasing drill diameter, and consecutively the implants are screwed in the osteotomies.

The practitioner is hereby guided by the guide template.

The guide template is in general provided of a curved shape, according to the bone structure whereon it is applied, and is provided of guiding bores wherein usually metal guiding tubes can be provided.
Apart from the guiding bores in line with the implants to be placed, a guide template is usually also provided of guiding bores in line with the fixation screws, which also serve as screw head holders.

The implants generally have a cylindrical shape with a threaded external surface. The implants are made of a bio-compatible material and are usually screwed in the jawbone over their complete height.

The top free end of each implant is generally provided of a central threaded cavity for mounting the teeth prostheses.

With the implants in place, it is common practice to have an accommodation period for the implants before mounting the replacement teeth or the prosthesis.

Alternatively, the prosthesis can be mounted immediately after applying the implants in the mandible or the maxilla. Such immediate application of the prosthesis is often referred to as "direct loading".

A typical known guide template is made in function of a so called planning of the implants.

The planning of the implants is about determining how much implants will be required for appropriate fixation of the replacement teeth, about determining the dimensions of the implants and about determining their positioning and orientation.
The planning can be performed on a computer, for example by first scanning the patient with a computed tomography scanner, CT-scanner in short, and by simulating the implants on the CT-scans.

A guide template can optionally also serve to assist and guide the dental surgeon during the screwing of the implants.

A guide template is often made by means of Rapid Prototyping techniques.

In case the guide template is bone supported, it is adapted to fit on part of the bone of the patient, i.e. after the gums have been opened.

It should be noted that the bone may have a very irregular surface. As the guide template is designed based on data coming from the CT-scan, the part of the template in contact with the bone will have an inner surface which always follows the shape of the irregular surface very precisely.

This approach results in an accurate positioning at all time.

A guide template enables pre-operative transferral of the drill directions in conformity with the planning of the surgeon.

A guide template is optimally designed such that it can be used for all implants. A template is put only once on
the patient and is possibly fixed temporarily by means of fixation screws.

The physical guiding of the drills is performed by guiding tubes provided in bores in the guide template.

The bores often comprise a metallic tube with an internal diameter slightly bigger than the outer diameter of the drill for which they are meant.

The osteotomies are generally drilled by two or more drills with incrementing diameter.

Therefore, another template should be provided for each drill size with corresponding internal diameter.

Alternatively the bores can be provided of a fixed bush or tube with an internal thread wherein a series of interchangeable bushes or tubes with corresponding external thread but with varying internal guiding diameter can be screwed.

A drawback of any of the above known guide templates is that during the operation, the surgeon is not able to observe the drill approaching and entering the bone structure.

Neither is the surgeon allowed to adjust his actions during the operation. He/she is tied to his/her planning as the known guide templates impose a rigid scheme.
Another limitation of any of the above known guide templates consists of the difficult access of the bores, certainly in the back of the mouth of the patient.

Indeed, the typical height of a guide template is 10mm, and the typical height of a drill is 13mm, in line of which is positioned the drill head with a typical height of 10mm.

It is clear that a required free height of more than 30mm can be a limiting factor during the surgical operation, certainly in the back of the mouth and/or when remaining teeth are unluckily positioned.

Moreover, when a guide template is designed to be partially or entirely supported on the gums and/or remaining teeth of the patient, even less space is available.

GENERAL DESCRIPTION OF THE INVENTION

The present invention relates to a device for placing dental implants which aims to eliminate the constraints related to the known guide templates of the prior art.

More specifically the object of the invention is a device for placing dental implants, which device comprises one or several ducts for guiding one or several drills for applying one or several osteotomies in a bone structure of a patient and/or for guiding the insertion of one or more implants, whereby the device, at least for one of the ducts, is provided of an opening that allows
the surgeon to access or inspect the bone structure at the point where, and at the time that the drill enters the bone structure.

5 Such an opening in a duct can be of any shape or any size and is preferably positioned lateral to the drilling direction and/or implant insertion direction.

For clarity reasons, where "lateral" is used in the present text, it should be interpreted as being lateral with respect to the drilling axis and/or with respect to the corresponding centreline of the implant, which is generally also the line along which the implant is inserted in a drilled osteotomy.

15 A lateral opening can be positioned at any side of the duct. When placed into the mouth, the opening and the lateral access can be positioned and/or oriented in different ways, be it anterior, posterior, lateral, lingual or any other direction.

Before placing the implants, an incision is performed on the crest, allowing for preparation of the mucoperiosteal flaps. After flap preparation and using the guide template according to the invention, the surgeon has a very good direct view on the bone surface.

Such an opening that allows the surgeon to access or inspect the bone structure at the point where, and at the time that the drill enters the bone structure, allows the surgeon to modify his initial treatment plan according to.
new findings encountered during the surgical intervention.

A device according to the invention improves direct inspection of the bone as the surgeon can visually follow the procedure evolving and follow the insertion of a drill and/or the insertion trajectory of the implant.

Furthermore, the exposition of the bone will prevent remnants of soft tissue to be impinged during drilling or implant placement.

The open accessibility of the bone also allows for copious rinsing during the drilling procedure, allowing optimized cooling of the drills and as such prevent undesired heating of the drills.

It is known that heating above 40°C is undesired as it kills bone cells which retards the natural fixation of the implants.

According to a preferred embodiment, the opening is mainly provided at the height where the drill enters the bone.

Preferably, the opening is provided at the side that allows the surgeon optimal visible inspection during the operation.

In general, the optimal side for such an opening that allows visual inspection is the buccal side, i.e. the side of the cheeks, although occasionally, visual
inspection and follow up of the surgical procedure may be easier from the lingual or palatal side.

Ideally there is no material at all at the inspection or access side.

According to another preferred embodiment, the opening is provided at both the buccal and the lingual side, which leaves all options open and which allows to arrange for a stream of cooling and/or rinsing liquid.

According to a preferred embodiment, when more than one duct is provided, the device also comprises rigid connection means between the said ducts in order to guarantee a rigid whole.

The rigid connection means can be of any form and are provided to guarantee a rigid device, which will not break or bend during the surgical intervention.

Preferably, the ducts and the rigid connection means are integrally formed in one piece.

The rigid connection means and the ducts are generally so connected that the global shape of the device corresponds the arc shape of the portion of the mandible or of the maxilla on which it is applied.

According to another preferred embodiment, the device is provided of one or more support structures which are designed to fit and find support in the mouth of the patient for which the device is designed.
The device may take support on the patient's jawbone, but according to the clinical needs, additional support can be taken on the mucosa of the patient, neighbouring teeth or even on earlier placed implants or screws, or on any combination of these. The purpose of the support is to offer a guarantee to the surgeon that the device is placed as precise as possible.

According to an aspect of the invention, a support structure consists of discrete supports, optionally saddle shaped in case they are meant to be provided on the bone structure.

Such discrete supports, as opposed to the known continuous support which stretches over the complete course of the known guide templates, allow to provide a free space between major portions of the guide template and the jawbone, which improves visibility on the jawbone and introduces flexibility.

For the same motifs, discrete supports are optimally positioned at a distance from the ducts.

At least it is useful not to provide a support in line with a duct at the most visible side for the surgeon.

A traditional support to be positioned on the bone is generally provided of a central through going hole through which a screw or a stainless steel rod can be provided. Thanks to the anchorage of the guide template
to the bone, such a support is generally said to be active.

A support to be positioned on teeth or mucosa are generally not provided of anchorage means and are therefore often called passive supports.

A support on an earlier provided implant or screw can be either active or passive.

The supporting structures are so defined to provide the surgeon with a device which can easily be placed in a reproducible way.

The number of supporting points may vary according to the clinical situation, but the aim is to provide a good stabilization so that the device will not displace, bend or tilt during the surgical procedure.

According to an important aspect of the invention, the opening that allows the surgeon to access or inspect the bone structure, optionally mainly provided at the height of the bone, is extended such that it takes away a portion of the mantle that surrounds the corresponding duct.

Optionally this extended opening is stretched up till the free extremity or the so-called collar of the duct, the border line of the mantle surrounding the duct distal from the support side of the device.
In this last case, the duct shows a lateral opening and an open collar which, in case it is wide enough, may permit lateral access for the drills.

As such, a duct with such a wide lateral opening stretching up till the collar of the duct, may drastically improve the accessibility for the drills during the surgical operation, and/or may further improve visual inspection and accessibility to the bone for the surgeon. The drills can be positioned without the need for lifting the drill tip over the upper border of the guiding bore of known guide templates of the prior art, as in a guide template according to the last preferred embodiment, the drill can be brought in position through the lateral opening.

In cases where severe maxillary atrophy bony implants can be used, the so-called zygoma implants, the implants can be placed anywhere where bone can be reached starting from the intra oral position, such as the zygoma, skull bone, pterygoid bone, temporal bone, sphenoid bone, etc.

Also in these cases, the guide template according to the invention can be used for guiding the drills and/or for guiding the insertion of the implants. A lateral opening stretching up till the collar of the duct will facilitate greatly the insertion of the corresponding drills which can be up to 70mm long.

In these cases, the ducts can protrude up to 30mm from the supporting structure, so as to provide a long and secure guiding for the drills.
The lateral opening allows the drill to be inserted under a range of angles, sometimes preferred because of the sharply shaped top surface of the bone which may complicate initial insertion of the drill. After entry in the bone, the drill is reoriented according to the planned orientation as defined by the duct.

Furthermore, the initial drilling guided by means of a device according to the invention, preferably performed with a small drill diameter, must not necessarily be performed exactly according to the line of insertion of the implant to be placed.

This flexibility will be appreciated by the dental surgeon. He/she is aware of the fact that only the last drilling operation, performed with largest drill diameter mainly corresponding the outer diameter of the implant, should be guided by the duct thereto provided in the guide template.

Independent of the above aspects of the invention, the present invention is also about a device for placing dental implants provided of fiducial reference points or structures which will allow the surgeon to verify the correct positioning of the device compared to a foreseen position of device when the implants were planned and the device designed.

The fiducial structures could eventually allow the surgeon to check if the position of the device accords to the peroperatively planned position.
The position of the fiducial structure is not fixed and can be placed anywhere on the device.

5 BRIEF DESCRIPTION OF THE DRAWINGS

With the intention of better showing the characteristics of the invention, hereafter, as an example without any limitative character, is described a preferred embodiment of the device for placing dental implants according to the invention, reference being made to the accompanying drawings, wherein:

figure 1 represents a perspective view of a device for placing dental implants according to the invention;
figure 2 represents a top view according to arrow F2 in figure 1;
figure 3 represents the device of figure 1, fixed on a patient's jawbone.

DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

In figures 1 to 3, a guide template 1 according to the invention is represented.

The guide template 1, here designed for application on the mandible of a patient, mainly consists of an arc shaped body 2 mainly forming a plain with in this case a downward oriented support side 3 and an upward oriented tool side 4 for the drills.
The support side 3 is here provided of three discrete saddle shaped supports 5 of which the shape and their positions are in accordance with the shape of the mandible whereon the guide template 1 is meant to fit.

This arc shaped body 2 is further provided of four half-open cylindrical ducts 6 for guiding the drills.

The guide template 1 can also be seen as ducts 6 which are interconnected by means of rigid connection means.

The rigid connection means and the ducts 6 are so connected that the global shape of the device corresponds the arc shape of the portion of the mandible on which it is applied.

The height of the ducts is here 10 mm.

The lateral openings 7 of the ducts 6 are in the given embodiment, as preferred, all oriented towards the outer or buccal side 8 of the arc shaped bode 2 of the guide template 1.

In the represented embodiment, the guide template 1 shows no material portions at it's outer side 8 in line with the ducts 6.

In other words, there are no material portions of the guide template 1 neither in the prolongation of the lateral openings 7, nor further in the direction of the outer side 8.
The saddle shaped supports 5, one in the middle of the guide template 1, and one near each of the free ends 9 of the arc shaped body 2, are in this case generally directed in line with the drill direction for the implants.

They are integrally formed with the arc shaped body 2 and protrude at the support side 3, in this case with a cylindrical portion 10 and a saddle shaped free end 11, adapted to fit the corresponding jawbone.

Each of the saddle shaped supports 5 is provided of a through going bore 12.

The application and the functioning of a guide template 1 according to the invention is simple and as follows.

The guide template 1 represented and described above is, in this case, made by means of a 3D-printing technique and is a so-called "bone supported" guide template 1.

This means that the surgical operation requires making a ridge incision and opening the mucoperiosteal flaps to free the bone surface 14.

The saddle shaped supports 5 fit on the bone 13 of the patient, as shown in figure 3.

It should be noted that the bone 13 may have a very irregular surface. As the guide template 1 is designed based on data coming from a scanner, for example a CT-scan or a conebeam scan, the saddle shaped supports 5
will have an inner surface corresponding the shape of the irregular surface very precisely.

The result is that there will always be an accurate positioning and preferably a unique position in which the guide template fits and is automatically maintained in its position thanks to some elastic deformation of the plastic material.

It should also be noted that, according to a variant, said guide template 1 can be provided with a contact part which is not or not solely designed to be supported on the bone 14, but (also) cooperates with parts of the gums and/or remaining teeth of the patient.

This guide template 1 can be screwed down temporarily to the patient.

The through going bores 12 guide the drills for preparing the holes wherein the osseo-synthesis fixation screws are screwed, and they also serve as screw holders of these screws.

A good and stable fixation is guaranteed as these fixation screws are situated in the centerline of the saddle shaped supports 5.

The application of these screws is optional and is meant for fixing the guide template 1 to the jawbone 13 during the surgical procedure.
Now the guide template 1 is fixed in position and the dental surgeon can start the drilling of the osteotomies.

The osteotomies are often drilled in various steps with drills of increasing diameter.

In order to avoid replacement of the guide template 1 for the consecutive drill sizes, the ducts 6 can be provided of replaceable half-open inserts with incrementing internal diameter, not represented in the drawings.

These inserts may be made of an appropriate metal and may be provided of holding ribs parallel to the drilling axis. Such ribs which fit in grooves in the arc shaped body 2 guarantee that the inserts are maintained in position during the drilling, but allow the inserts to be placed or removed easily by forcing the ribs to slide in and out the grooves in the body 2.

Alternatively, a drill can be provided with a staged diameter profile such that one drill and one duct 6 diameter suffices.

The guide template 1 enables pre-operative transferral of the drill directions in conformity with the planning of the surgeon.

The guide template 1 has been designed such that it can be used for all implants.
After the osteotomies are drilled, optionally a thread is tapped in the bone 14, and consecutively the implants are screwed in the osteotomies.

Also during the screwing procedure of the implants, the ducts 6 act as a guide for the accurate screwing of the implants.

It is clear that the guide template 1 according to the given embodiment not showing any material portion at it's outer or buccal side 8 in line with the ducts 6, generously provides an opening 7 that allows the surgeon to access and inspect the bone structure 13 at the point where, and at the time that a drill and/or an implant enters the bone structure 13.

It is clear that also a more reduced opening 7, for example at the height where the drill enters the bone 13 or in the neighbourhood thereof, could already be sufficient for obtaining improved visibility and accessibility of the bone 13.

A device according to the invention improves direct inspection of the bone as the surgeon can visually follow the procedure evolving and follow the insertion of a drill and/or the insertion trajectory of the implant.

The exposition of the bone 13 will prevent remnants of soft tissue to be impinged during drilling or implant placement.
The open accessibility of the bone 13 also allows for copious rinsing during the drilling procedure, allowing optimized cooling of the drills and as such prevent undesired heating of the drills.

The fact that the lateral openings 7 are provided up till the access side 4 of the guide template 1, such that the free extremities of the ducts 7 at the height of the access side 4, the so-called collars of the ducts, are open, allows much easier access for the drills, the implants and the screwing tools.

The ducts 6 are in this case embodied as half-open ducts 6, of which the lateral openings 7 are oriented towards the outer or buccal side 8 of the arc shaped body 2 of the guide template 1, i.e. towards the outside space of the patient's mouth.

This embodiment is mostly suitable for bringing the drills or the tools in position according to a first direction, and thereafter drilling the osteotomies or screwing the implants according to a second direction mainly perpendicular to the first direction.

There is no need for lifting the drills or the tools over the tool side 4 of the guide template 1.

In fact, the outer side 8 delivers lateral access to the drills and tools in order to put them in operational position.
The characteristic of the guide template 1 showing no material portions at its outer side 8 in line with the ducts 6 results in the crucial advantage for the surgeon having improved visibility on his actions at the level of the jawbone 14.

The surgeon can observe the drills going in the jawbone 13 and/or the implants going down the osteotomies.

It is clear that this visual feedback is of crucial importance.

Furthermore, it allows for copious rinsing during the surgery so that the bone particles are removed during drilling. This removal of these particles is of key importance as the impact of bone particles on the drill can cause bone heating. Furthermore, the rinsing liquid will serve as a cooling liquid too.

The lateral openings 7 also leave space for flexibility.

The dental surgeon can consider slight amendments in his approach as compared to the planning. He/she is not tight to the planning made. The preparation and planning are reduced to the essence of their function. If the practitioner, prepared for the surgical operation, realizes at the moment of the operation that a slightly different approach would be more convenient, he/she has the freedom to do so.

In case inserts are provided in the ducts, these can be placed and removed, for example by a sliding movement.
where ribs cooperate with grooves, according to the needs of the practitioner.

It should be noted that it is not excluded, and that it is part of the present invention, that a first template is provided for guiding the drills, and that a second template is provided for guiding the insertion of the implants.

Such a dedicated guide template for guiding the surgeon during the insertion of the implants may have smaller "inspection" opening or openings in the duct, resulting in an optimal support for the implant and/or for the tools during the insertion of the implant, and allowing sufficient visible feedback through the somewhat smaller opening or openings.

Such a second template uses the same position of the fixation screws or fixation pins as the first template for guiding the drills.

It's sole function is to securely guide the implants while being inserted in the bone. As such, rinsing and cooling are not as relevant as during the drilling operation, and the openings in the ducts may be reduced in size.

It is clear that an opening provided in a device according to the present invention, mostly relevant when the opening is provided in a massive portion of the guide template, may be oriented under an appropriate
inclination with respect with the drilling or implant
insertion axis.

For example, in case a narrow tunnel shaped opening is
provided in a massive portion of a guide template, the
opening can be oriented towards the view position of the
surgeon which is not necessary perpendicular to the
drilling or implant insertion axis.

It is clear that the lateral openings 7 of the half-open
ducts 6 can alternatively also be provided at the
internal or lingual side of the arc shape body 2, or at
the anterior or posterior side, or at any side or sides
which might be appropriate. This can for example be
useful for implants in the back of the mouth, where
access is easier from the internal side of the arc shaped
body 2.

In that case, the guide template 1 ideally doesn't show
material portions at it's internal side in line with the
ducts 6, in order to have a free access for the tools and
a good visibility on the jawbone 13 for the surgeon, at
least on the place of entry of the drills and of the
implant.

It should be noted that where is referred to a "half-
open" duct 6, be it cylindrical or not, it is not to be
considered as a stringent condition. It is clear that a
lateral opening can be of any size and any shape. A
lateral opening can take away only a small portion of the
mantle of a duct 6, it can be narrow or wide, stretched
or short.
The height of the ducts 6 preferably is situated in the range of 6mm to 14mm, and ideally between 8mm and 12mm.

A duct 6 may have a smaller height of for example 5mm or even 4mm, and of course of values in between these examples, but the smaller the height, the less support is found during the drilling and/or during the insertion of the implants.

It is clear that a guide template 1 can have lateral openings 7 in the ducts 6 which do not reach till the tool side 4. In such case, the upper contour of the mantle defining the duct 6 is not interrupted, taking away the advantage of easier access for the tools, but still providing the improved visibility for the surgeon on the place where the drill enters the bone 14.

It is clear that the guide template 1 can be bone 13 supported or can be supported by the mucosa, by the teeth, by earlier placed implants or screws or a combination of these possible supports. New imaging techniques based on for example MRI or optical scanning techniques may allow further development.

It should be noted that the device according to the present invention can be applied in combination with various drilling techniques. When the present document refers to drills or drilling techniques, it is meant to comprise all possible techniques that allow to remove bone tissue, such as for example the piezo drill which removes tissue by means of vibration energy.
The invention is in no way limited to the embodiments described above and represented in the appended drawings, as a device for placing dental implants according to the invention can be realized in various ways without departure from the scope of the invention.
Claims.

1. Device for placing dental implants, which device comprises one or several ducts (6) for guiding one or several drills for applying one or several osteotomies in a bone structure (13) of a patient and/or for guiding the insertion of one or more implants, characterised in that at least for one of the ducts (6), an opening (7) is provided that allows the surgeon to access or inspect the bone structure (13) at the point where, and at the time that a drill and/or an implant enters the bone structure (13).

2. Device according to claim 1, characterised in that the opening (7) is mainly provided at the height where the drill enters the bone (13).

3. Device according to claim 1 or 2, characterised in that the opening (7) is provided at the side that allows the surgeon optimal visible inspection during the operation.

4. Device according to any of the preceding claims, characterised in that the opening is situated at the buccal side, i.e. the side of the cheeks.

5. Device according to any of the preceding claims, characterised in that the device is free of any material portions at the inspection or access side.
6. Device according to any of the preceding claims, characterised in that, in case that more than one duct (6) is provided, the device comprises rigid connection means between the said ducts (6) in order to guarantee a rigid whole.

7. Device according to claim 6, characterised in that the device is provided of one or more discrete supports (5).

8. Device according to claim 7, characterised in that the discrete supports (5) are positioned at a distance from the ducts (6).

9. Device according to any of the preceding claims, characterised in that the opening (6) that allows the surgeon to access or inspect the bone structure (13) is extended up to at least a portion of the mantle that surrounds the corresponding duct (6).

10. Device according to claim 9, characterised in that the opening is stretched up till the free extremity or the so-called collar of the duct (6).

11. Device according to claim 10, characterised in that the opening (7), at least near the free extremity or the so-called collar of the duct (6), is provided of a width sufficient to allow lateral introduction of a drill and/or an implant.

12. Device for placing dental implants, which device comprises fiducial reference points or
structures which will allow the surgeon to verify the correct positioning of the device compared to a foreseen position of device when the implants were planned and the device designed.
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

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According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

A61C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of Box C. See patent family annex.

- Special categories of cited documents:
  - "A" document defining the general state of the art which is not considered to be of particular relevance
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- Date of the actual completion of the international search: 9 August 2010
- Date of mailing of the international search report: 17/08/2010 0

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