Datum: 30. September 2009

Case Number: T 0509/07 - 3.5.04
Application Number: 01918222.9
Publication Number: 1269744
IPC: G06T 15/70
Language of the proceedings: EN

Title of invention:
Methods for generating image set or series with imperceptibly different images, systems therefor and applications thereof

Applicant:
Hourplace, L.L.C.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 123(2)

Relevant legal provisions (EPC 1973):
EPC Art. 56, 84, 108

Keyword:
"Main request not admitted into the appeal proceedings"
"Treatment of non-technical problem described in the application"

Decisions cited:
J 0003/06, J 0010/07, T 0220/83, T 0382/96, T 0774/97, T 0641/00, T 0643/00, T 0049/04, T 0809/06, T 0358/08

Catchword:
see Sections 2 and 5
Case Number: T 0509/07 - 3.5.04

DEcision
of the Technical Board of Appeal 3.5.04
of 30 September 2009

Appellant: Hourplace, L.L.C.
Suite 353
333 W. North Avenue
Chicago, IL 60610 (US)

Representative: Goddar, Heinz J.
Forrester & Boehmert
Pettenkoferstraße 20-22
D-80336 München (DE)


Composition of the Board:
Chairman: F. Edlinger
Members: C. Kunzelmann
B. Müller
Summary of Facts and Submissions

I. The appeal is against the decision of the examining division to refuse European patent application No. 01 918 222.9.

II. The decision was taken on the basis of claims 1 to 30 of 9 October 2006 and was based on objections under Article 84 EPC 1973, Article 54(1) and (2) EPC 1973 and Article 56 EPC 1973. The reasons for the decision can be summarised as follows. The independent claims 1, 12 and 29 were not clear because the term "imperceptibly different" was vague and unclear. Parameters specifying this term only in the description were not suitable for limiting the scope of the claims. Whether an image was imperceptibly different from an immediately preceding image depended on many parameters. The above-mentioned lack of clarity notwithstanding, the subject-matter of claims 1 and 29 was not new with respect to either of the prior art documents

D1: US 5 982 440 A and

Furthermore the subject-matter of independent claim 12 did not involve an inventive step having regard to document D2.

III. The applicant appealed and requested as a main request that a patent be granted on the basis of the application documents on which the decision under appeal was based. The statement of grounds of appeal comprised only one sentence concerning the claims according to the main request, namely "However, the
applicant believes that the current application satisfies articles 84, 54 and 56 EPC and maintains his respective arguments presented up to now in the examination procedure." The appellant also filed claims according to an auxiliary request and a detailed statement of grounds of appeal relating to this request. Furthermore the appellant filed an article written by the inventor and entitled "Subthreshold Data Cognition: Adaptive "Mitigation" Strategy" published in 2006.

IV. In a communication in accordance with Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA), annexed to a summons to oral proceedings, the board expressed doubts whether the claims according to the main request would be admitted in the appeal proceedings as the grounds as to why the decision under appeal should be set aside on the basis of the main request were not part of the appellant's case made with the statement of grounds of appeal. The board also raised doubts whether claim 1 of the auxiliary request met the requirements of Article 123(2) EPC. The board also expressed doubts whether the subject-matter of claim 1 of the auxiliary request involved an inventive step because the problem to be solved by the invention did not appear to be a technical problem within the meaning of Rule 27(1)(c) EPC 1973, and its solution appeared to consist in a straightforward choice of parameters.

V. With a faxed letter dated 28 August 2009 the appellant filed replacement claims of the auxiliary request.

VI. Oral proceedings were held on 30 September 2009. During the oral proceedings the appellant filed claims 1 to 4.
of the auxiliary request replacing the previous claims. The appellant also indicated his willingness to replace the word "image" in line 3 of claim 1 of the auxiliary request by "image conveying information". At the end of the oral proceedings the chairman announced the board's decision.

VII. Claim 1 of the final auxiliary request reads as follows.

"A method for generating an electronic binary data file playable as a moving picture by a digital processor comprising the steps of:

(a) providing a first electronic representation of an image to a data processing system;
(b) using a predetermined display rate for an electronic display, processing at least said electronic representation of said image with said data processing system and generating a series of electronic representations of transition images to be displayed in series on at least a first portion of said electronic display as a moving picture so as to provide a changing image on said first portion of said electronic display, said display rate being used to determine the number of electronic representations of transition images generated for said series, wherein each transition image is to be displayed over at least 5 seconds of a moving picture interval and during said interval the electronic representations of the respective transition image are the same; and
for the image and the first transition image of the series, the pixel value difference for each color space component for each corresponding pixel in the first electronic representation of the image and the
electronic representations of the first transition image of the series is 20 percent or less such that the first transition image of the series is imperceptibly different from the image and for two transition images to be displayed in series, the pixel value difference for each color space component for each corresponding pixel in the electronic representations of the first transition image of said two transition images and the electronic representations of the second transition image of said two transition images is 20 percent or less such that the second transition image of said two transition images is imperceptibly different from the first transition image of said two transition images."

VIII. The appellant's arguments may be summarised as follows.

Neither D1 nor D2 disclosed using a prior image to specifically generate a different image that differed by only 20 percent or less for any colour space component individually and over a playback time of at least 5 seconds. Nor did D1 or D2 disclose using a predetermined display rate for an electronic display to determine the number of transition images generated to be displayed in series on the electronic display.

Both D1 and D2 concerned the concept of morphing images so as to produce a spatially smooth transition between different images. When an image was morphed into another image the duration of the transition was arbitrary.

The invention however was based on the controlled temporal change of individual pixels or groups of
pixels. The change of the pixels was always temporally smooth but might be spatially jagged. The invention made change unnoticeable, except over relatively long periods of time. This technique of making change unnoticeable was a cutting edge technology which was now successfully applied in many different technical applications. It was used to filter information displayed to operators. The operator-system interaction was improved because irrelevant information was displayed such that the operator did not notice the change of information and thus was not distracted thereby. Hence the operator concentrated his attention on the relevant information displayed. The invention used a subthreshold method of change that did not cause a disruption such as a saccade, a transient or a spike in visual signal strength, as explained in the inventor's article filed with the statement of grounds of appeal. Improving the operator-system interaction was a technical problem as stated in decision T 49/04. In particular, according to section 4.6.3 thereof, a feature which related to the manner in which the "cognitive content", such as images, was conveyed to the user could very well be considered as contributing to a technical solution to a technical problem. This would in particular be the case when the particular manner of conveying the information enabled the user to perform their task more efficiently as stated in decision T 643/00, point 17 of the reasons. A more efficient interaction was also enabled by the present invention. The fact that a further effect could be an artistic one was no obstacle if this was not the only relevant effect, as could be deduced from point 16 of T 643/00.
IX. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims 1 to 30 of 9 October 2006 (main request), and as an auxiliary request on claims 1 to 4 submitted in the oral proceedings of 30 September 2009.

Reasons for the Decision

1. Admissibility of the appeal

1.1 The appeal is admissible. It complies, in particular, with Article 108, third sentence, EPC according to which, "[w]ithin four months of notification of the decision, a statement setting out the grounds of appeal shall be filed in accordance with the Implementing Regulations." Pursuant to Rule 99(2) EPC, "[i]n the statement of grounds of appeal the appellant shall indicate the reasons for setting aside the decision impugned, or the extent to which it is to be amended, and the facts and evidence on which the appeal is based." Article 108 of the EPC 2000 applies according to Article 1, No. 1, of the Decision of the Administrative Council of 28 June 2001 on the transitional provisions under Article 7 of the EPC Revision Act (see special edition No. 1/2007 OJ EPO, at pp. 197 et seq.). Rule 99(2) of the EPC 2000 applies because it is related to Article 108, third sentence, EPC (cf. J 3/06, OJ 2009, 170, point 3).

1.2 The board considers that Rule 99(2) EPC is in line with established case law (summarised in Case Law of the Boards of Appeal of the EPO, 5th edition 2006, VII.D.7.5.1; T 358/08 seems to arrive at the same
conclusion, see points 3.13.3 and 4.11). The board therefore sees no difference in substance to the corresponding legal situation under the EPC 1973, where the pertinent provisions were limited to those set out in Article 108, third sentence, and the required content of the statement of grounds was not expressly specified. Therefore there would be no difference in substance if the board had followed the approach taken by the Legal Board in J 10/07 (OJ 2008, 567) which considered that those provisions applied where, as in the present case, on expiry of the time limits set out in Article 108 EPC 1973, the EPC 2000 had not yet entered into force.

1.3 Under established case law, the grounds for appeal should specify the legal or factual reasons on which the case for setting aside the decision is based. If the appellant submits that the decision under appeal is incorrect, the statement setting out the grounds of appeal must enable the board to understand immediately why the decision is alleged to be incorrect and on what facts the appellant bases its arguments, without first having to make investigations of their own (cf. T 220/83, OJ EPO 1986, 249, point 4, affirmed by numerous decisions and more recently by T 809/06, at point 2).

In principle, a statement of grounds which merely refers generally to previous submissions is not considered sufficient. An exception to this principle has been acknowledged where the arguments presented at first instance already adequately addressed the grounds underlying the contested decision (see Case Law of the Boards of Appeal, ibid., VII.D.7.5.4). Similarly, a
brief statement may be considered sufficient where a substantial violation of the first-instance proceedings occurred, or where a reading of the impugned decision itself reveals that it cannot be upheld (see T 809/06, at point 4, and the cases cited there).

1.4 The board considers that the requirements of established case law set out above in the first part of point 1.3 are clearly complied with in relation to the first auxiliary request submitted with the statement of grounds. Whether or not sufficient grounds relating to the main request have been submitted is immaterial for the purposes of admissibility of the appeal because an appeal can only be assessed as a whole; see T 382/96, point 1. There is no support in the EPC for a notion of "partial admissibility" of an appeal (see T 774/97, point 1.1 in fine). In other words: if the admissibility requirements, in particular those of Article 108, third sentence, EPC, are fulfilled at least in respect of one request, the appeal as a whole will be admissible. As a consequence, the present appeal is admissible.

2. Admissibility of the main request

2.1 However it is a different question whether a request in relation to which the admissibility requirements are not met, in particular where sufficient grounds within the meaning of Article 108, third sentence, EPC have not been furnished in relation to that request, is admitted into appeal proceedings.

In decision T 382/96 it was held that several requests could not be admitted into the appeal proceedings
because no grounds of appeal within the meaning of Article 108 had been filed in relation to those requests (see point 5.5). In the board's view this conclusion can be arrived at by assuming that such requests cannot be considered in appeal proceedings.

In this context the Rules of Procedure of the Boards of Appeal are also of interest. Pursuant to Article 12(1)(a) RPBA, appeal proceedings shall be based on the notice of appeal and statement of grounds of appeal filed pursuant to Article 108 EPC. Under Article 12(2) RPBA the statement of grounds of appeal shall contain a party's complete case, setting out clearly the reasons why it is requested that the decision under appeal be reversed, amended or upheld, and should specify expressly all the facts, arguments and evidence relied on. Article 12(4), in pertinent part, provides that everything presented under Article 12(1) shall be taken into account by the board if and to the extent it meets the requirements of Article 12(2). It could be concluded, e contrario, that one need not take into account matter which does not meet the requirements of Article 12(2) if the appellant has not specified the facts, arguments and evidence on which the appeal proceedings shall be based, but which might be supplemented later on. For, under Article 13(1) RPBA, any amendment to a party's case after it has filed its grounds of appeal may be admitted and considered at the board's discretion.

2.2 In the present case the board stated in an annex to the summons to oral proceedings (under point 1.1) that the statement of grounds of appeal comprised only one sentence concerning the claims according to the main
request, namely "However, the applicant believes that the current application satisfies articles 84, 54 and 56 EPC and maintains his respective arguments presented up to now in the examination procedure." The board added that this sentence appeared to neither set out clearly the reasons why it was requested that the decision under appeal be reversed, nor to specify which of the facts, arguments and evidence presented in the examination proceedings were relied on in appeal proceedings. In the oral proceedings the chairman reiterated that the statement of grounds did not contain sufficient information for the board to discern why the appellant believed the decision under appeal to be wrong, in particular in regard of the assessment of the feature "imperceptibly different". The appellant's submissions in reply, for instance that the invention was a cutting edge technology and thus the claims should not be unduly limited, did not address the relevant reasons in the decision under appeal and thus were not apt to change the board's view that the statement of grounds was deficient. Nor did the arguments presented at first instance, for instance that the description defined the term "imperceptibly different", make it possible for the board to immediately understand why the contested decision was alleged to be incorrect in its assessment that parameters specifying this term only in the description were not suitable for limiting the scope of the claims. For in the present case, the appellant's arguments were already dealt with in the decision under appeal. Thus the board cannot understand immediately why the decision is alleged to be incorrect. Likewise the board is unable to recognise that a substantial procedural
violation had occurred or detect from a mere reading of the decision that it could not be upheld.

2.3 It follows that, in relation to the main request, sufficient grounds within the meaning of Article 108, third sentence, EPC or Article 12(2) RPBA have not been furnished within the respective four-month time limit nor at a later stage of the proceedings.

As a consequence, the board arrived at a conclusion analogous to the one reached by the board in T 382/96, at point 5.5 (see point 2.1 above), that the main request cannot be admitted into the appeal proceedings. This conclusion can also be based on the provisions of the RPBA set out under point 2.1.

3. **Auxiliary request: amendments (Article 123(2) EPC)**

The amendments made in appeal proceedings specify the claimed method with features disclosed in the embodiment relating to displays having a predetermined display rate disclosed, for instance, on page 16, line 34, to page 17, line 24, as filed. Furthermore the particular choice of parameters which results in images which are imperceptibly different from each other is disclosed, for instance, on page 3, line 28, to page 4, line 21, as filed.

4. **Auxiliary request: clarity (Article 84 EPC 1973)**

The expression "imperceptibly different" objected to in the decision under appeal is also present in claim 1 of the auxiliary request. But present claim 1 now has additional features specifying the parameters which,
according to the application, result in two consecutive images being imperceptibly different. Specifically the pixel value difference for each colour space component for each corresponding pixel in the electronic representations of two consecutive transition images ("two transition images to be displayed in series") is 20 percent or less, and the same criterion applies to the difference between the (input) image and the first transition image. Claim 1 also specifies that each transition image is to be displayed over at least 5 seconds. Thus the claim makes clear how a spatially and temporally smooth transition between images is achieved. The board is satisfied that the amended claims are clear (Article 84 EPC 1973).

5. **Auxiliary request: inventive step (Article 56 EPC 1973)**

5.1 The closest prior art

The application discloses in the "background of the invention" that methods for generating an electronic binary data file playable as a moving picture by a digital processor belonged to the prior art. Concrete examples given are screen savers and programs for generating so-called morphed images. The application also discloses that the electronic binary data files may be stored on memory devices current at the priority date, such as DVDs (page 17, lines 18 to 24). It is implicit that such DVDs were adapted for use with conventional electronic display devices, such as television devices or monitor devices, which included or cooperated with a DVD player and that known file formats (which may be used in the present invention, such as MPEG; see page 16, line 35, and page 17, line 5)
for playing a moving picture on these electronic display devices had a predetermined display rate. It is also implicit that the predetermined display rate was taken into account when generating the files to be stored on the DVDs for subsequent display on the electronic display device. Known electronic binary data files playable as a moving picture comprised electronic representations of the images within the meaning of the word "representation" in present claim 1.

It was not contested that this prior art acknowledged in the application belonged at the priority date to the common general knowledge of a person skilled in the art of digital video processing. The board considers that this acknowledged prior art may be considered as the closest prior art for the purposes of assessing inventive step.

For the sake of completeness, the board notes that the teachings of D1 and D2 are also based on the assumption that digital video processing and file formats, such as MPEG, were known (see D1, column 1, lines 7 to 35, and D2, page 6, line 13, to page 7, line 5).

5.2 The problem mentioned in the description

5.2.1 The application mentions that "at least one problem associated with the playback of a sequence of images with perceptible differences therebetween, is that the motion and/or flicker and flashing created by the transitions between images can be quite annoying, if not distracting" (see page 1, lines 23 to 25). As a solution to this problem the invention according to
claim 1 specifies that generated images are "imperceptibly different" from each other.

5.2.2 The "problem" mentioned in the application is however a non-technical problem to be solved, the term "non-technical" in this decision referring to subject-matter which is not to be regarded as an invention within the meaning of Article 52(1) EPC (cf. T 49/04, point 4.3). Indeed, whether watching the playback of a sequence of images with perceptible differences is considered annoying or entertaining is primarily a subjective assessment of a human observer. And being distracted by nearby motion is generally speaking a natural (and likewise subjective) human reaction but not in itself a technical problem. Also the description specifies that a technical problem need not necessarily be present. Namely according to the description "[y]et a further application of the invention is in the presentation of images generated for artistic reasons. A display, such as a plasma screen, or a flat panel screen, could be used to display a new type of transition path as a new art form" (see page 16, lines 25 to 28). Thus the present application may relate to an aesthetic creation and may concern a problem where the imperceptibly different images are the desired aesthetic effect, which problem is different from that analysed in decision T 49/04, in which the board stated that a particular way of displaying text was "not to be considered as intended to create an aesthetic effect" (see T 49/04, point 4.8). Furthermore it follows from the above that the present application may concern a problem in which the only relevant effect of the displayed moving picture is the visually attractive nature of the artwork. Such a display of a moving
picture would not have technical character. At least in this respect the underlying problem is different from that considered in T 643/00, where a plural number of images of different resolutions in a side-by-side manner provided a technical tool for an efficient search, retrieval and evaluation of images (see T 643/00, points 14 and 17). Hence point 16 of T 643/00 deals with further non-technical aspects which are no obstacle if the whole range of the claim solves a technical problem as set out in point 14 of T 643/00. By contrast the scope of present claim 1 covers subject-matter where the only relevant effect is non-technical.

5.2.3 Other applications cursorily disclosed in the description (see page 13, lines 18 to 28, and page 16, lines 8 to 17) are business presentations (in which a logo or motivational message is caused to appear) and roadside advertisements (which evolve unnoticeable and thereby do not distract car drivers). Also a medical application is described in which the eye reflex of a subject may be tested. However the description, claims and drawings do not disclose any applications in which a user-system interaction is improved by causing irrelevant information to evolve unnoticeably for an operator.

5.2.4 Claim 1 does not specify any technical features of an application in which the generated electronic data file playable as a moving picture is to be used. Thus the board sees no reason to investigate whether any of the applications considered in point 5.2.3 above could be considered as a technical problem which is based on considerations of the technical usage. Considering the
full scope of the claim, the method of claim 1 does not necessarily solve one of the potential technical problems described in the application.

5.3 The objective technical problem

5.3.1 It follows from section 5.2 above that there is a need to reformulate the problem to be solved to take account of the full scope of "imperceptibly different" images specified in claim 1 when applying the "problem and solution approach". In this respect the established case law, as summarised in "Case Law of the Boards of Appeal of the European Patent Office", 5th edition 2006, I.D.8.1, is based on principles set out, for example, in decision T 641/00 (OJ 2003, 352). In particular where the claim refers to an aim to be achieved in a non-technical field, this aim may legitimately appear in the formulation of the problem as part of the framework of the technical problem that is to be solved, in particular as a constraint that has to be met. On the other hand the technical problem should not be formulated to refer to subject-matter contributing to the technical character of the invention of which a person skilled in the art would only have become aware by knowledge of the claimed solution (see T 641/00, point 7).

5.3.2 In the present case the two aims "that the first transition image of the series is imperceptibly different from the image" and "that the second transition image of said two transition images is imperceptibly different from the first transition image of said two transition images" are non-technical aims
for the reasons given in section 5.2 above and constitute the constraints which have to be met.

5.3.3 Thus in the present case a person skilled in the art of digital video processing would have been confronted with the following reformulated technical problem. On the basis of the closest prior art (see section 5.1 above), how to generate an electronic binary data file playable as a moving picture such that the constraints given in point 5.3.2 above are met?

5.4 Determining the physical parameters and parameter values necessary for solving the technical problem

5.4.1 In view of these non-technical constraints a person skilled in the art of digital video processing would have had to determine the physical parameters and parameter values which may be represented in an electronic binary data file playable as a moving picture and which result in the non-technical constraints being met. Already before digital video processing existed, these physical parameters and parameter values were the subject of studies of thresholds of human visual perception. It is accepted that generally an ordinary human observer cannot perceive a change of 20 percent or less in any single component of a colour space. For example, an ordinary human observer typically cannot perceive a 20 percent change in any one of hue, luminance, saturation and a colour component, such as cyan, magenta, yellow, red, or green (see page 3, line 30, to page 4, line 12, of the application, which refers to H.R. Blackwell's article "Contrast Thresholds Of The Human Eye"
5.4.2 Furthermore it is well-known and also acknowledged in the application (see page 4, lines 20 to 21) that, for a given amount of change in any single component of a colour space, "slow" changes (that is changes evolving over several minutes, hours or longer) are more difficult to perceive for an ordinary human observer than "quick" changes evolving within few seconds. Within this time frame generally, the slower the evolution is, the more difficult it is for an ordinary human observer to perceive the change. Hence the particular value of 5 seconds specified in claim 1 is an arbitrarily selected lower limit of a range of values which derives from the constraints given in point 5.3.2 above and the common general knowledge in the field of human visual perception.

5.4.3 Hence a person skilled in the art of digital video processing would have found out that the parameters and parameter values which allow the non-technical constraints given in point 5.3.2 above to be met and which may be represented as an electronic binary data file playable as a moving picture are those which are now specified in claim 1.

5.5 Generating an electronic binary data file playable as a moving picture solving the technical problem

5.5.1 The final step required for solving the reformulated technical problem (see point 5.3.3 above) would have been to represent the relevant physical parameters and
parameter values in an electronic binary data file playable as a moving picture.

The description of the invention does not give any details as to how electronic binary data files representing the images to be displayed are generated. On the contrary, the description indicates that "the file format can be of any suitable format such as MPEG ..." and acknowledges that "[t]he types of formats are well known to those in the image processing fields" (see page 16, line 35, to page 17, line 6).

Also the claims specify the processing of the electronic representations of the images essentially by specifying the parameter values and the constraints discussed in sections 5.3 and 5.4 above. Features explicitly specifying the generation of the electronic binary data file as such are not present in the claims. And the features relating the electronic representations of images to the electronic binary data file or to the data processing system all belong to the common general knowledge of a person skilled in the art of digital video processing or are implicit in the known method for generating an electronic binary data file as discussed in point 5.1 above.

For instance, given the constraints discussed in point 5.3.2 above, it was implicit in a method for generating an electronic binary data file, such as an MPEG-1 or MPEG-2 file, playable as a moving picture by a digital processor that it comprised a step of providing a first electronic representation of an image to a data processing system. An image had to be provided in some way to the data processing system which served as the
starting point for the series of images, such as a group of pictures in MPEG where differences between successive frames are coded for a given display rate.

Furthermore it was common general knowledge in the art of digital video processing that an image may be displayed over an interval of time by providing the same electronic representation of the image repeatedly, using the predetermined display rate for the electronic display, for instance when a still image is displayed for a certain time in an otherwise moving picture. Since the display (or frame) rate is determined by the video format and the system in which it is used, the number of pictures (or frames) has to be determined so as to achieve the desired display time (at least 5 seconds). This measure is also used in the application (see page 16, line 34, to page 17, line 24). Thus the feature of "using a predetermined display rate for an electronic display, processing at least said electronic representation of said image with said data processing system and generating a series of electronic representations of transition images to be displayed in series on at least a first portion of said electronic display as a moving picture so as to provide a changing image on said first portion of said electronic display, said display rate being used to determine the number of electronic representations of transition images generated for said series, wherein each transition image is to be displayed over at least 5 seconds of a moving picture interval and during said interval the electronic representations of the respective transition image are the same" was a straightforward measure for a person skilled in the art of digital video processing faced with the problem of generating an electronic
binary data file playable as a moving picture given the constraints mentioned in point 5.3.2 above.

5.5.2 Thus a person skilled in the art of digital video processing, starting from the prior art discussed in point 5.1 above and faced with the constraints given in point 5.3.2 above, would have arrived at a method for generating an electronic binary data file playable as a moving picture as specified in claim 1 by meeting these constraints in a straightforward manner.

5.6 The above argumentation would also apply if the image considered in claim 1 were specified to be an "image conveying information" as suggested by the appellant. This definition does not change the usual meaning of "image", and the steps of the method of claim 1 are not dependent on the cognitive content of the image.

5.7 Hence the board judges that the method of claim 1 does not involve an inventive step (Article 56 EPC 1973).
Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:     The Chairman:

L. Fernández Gómez     F. Edlinger