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Datasheet for the decision of 2 December 2014

Case Number: T 1415/10 - 3.5.02

Application Number: 00981807.1

Publication Number: 1154570

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Language of the proceedings: EN

Title of invention:
SAW Device

Applicant:
Toppan Printing Co., Ltd.

Relevant legal provisions:
EPC Art. 56, 84

Keyword:
Claims - clarity after amendment (yes)
Inventive step - (yes)

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Case Number: T 1415/10 - 3.5.02

D E C I S I O N
of Technical Board of Appeal 3.5.02
of 2 December 2014

Appellant: (Applicant)	Toppan Printing Co., Ltd. 5-1, 1-chome, Taito Taito-ku, Tokyo 110-0016 (JP)
Representative:	TBK Bavariaring 4-6 80336 München (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 18 December 2009 refusing European patent application No. 00981807.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	M. Ruggiu
Members:	R. Lord
	W. Ungler

Summary of Facts and Submissions

I. This is an appeal of the applicant against the decision of the examining division to refuse European patent application No. 00 981 807.1. The reasons given for the refusal were that claim 1 of the main request then on file was not clear, thus not meeting the requirements of Article 84 EPC, and that the subject-matter of that claim was not new within the meaning of Article 54 EPC.

II. The following documents of the prior art cited during the procedure before the examining division are relevant for this decision:

D1: US 3 815 056 A,
D2: US 3 879 673 A,
D3: JP 5 136 649 A and English abstract,
D4: D. Royer et al "Optical generation and detection of surface acoustic waves on a sphere", Applied Physics Letters, vol. 52, no. 9, 29 February 1988, pages 706 to 708.

III. Oral proceedings before the board took place on 2 December 2014. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 6 of the main request filed during those oral proceedings, Description: pages 4, 6, 7, 9, 16, 22 and 23 filed during those oral proceedings; pages 1 to 3, 5, 8, 10 to 15, 17 to 21, 24 to 28 as originally filed; Drawings: sheets 1/4 to 4/4 as originally filed,

or that a patent be granted on the basis of the claims of one of the auxiliary requests 1 to 6 as filed with letter of 31 October 2014.

IV. Claim 1 according to the appellant's main request reads as follows:

"An elastic surface-wave device (10) comprising

a substrate (12; 60), and

a surface acoustic wave generator (14) which is provided on a surface of the substrate and generates surface acoustic waves on the surface,

characterized in that:

the substrate (12; 60) has a circular continuous surface portion (12b) which is configured by a part of a spherical surface and is continuous in a first direction, that part of the circular continuous spherical surface including the maximum circumferential length of the spherical surface in said first direction; and

the surface acoustic wave generator (14, 14a, 14b, 14c) is provided on the circular continuous surface portion of the substrate and arranged to generate surface acoustic waves on the circular continuous surface portion along said first direction,

wherein a wavelength of said generated surface acoustic waves is determined by a distance between a plurality of electrode pieces of a comb-like electrode (14c) of said surface acoustic wave generator in said first direction, the electrode width being a length for which the plurality of pieces of the comb-like electrode are opposed to each other,

wherein a ratio of the circumferential length of the spherical surface and said wavelength defines a wave number parameter, wherein the wavelength is not more than 1/10 of a radius of the spherical surface of the substrate,

wherein from said wave number parameter one wave collimating angle is obtained, said collimating angle being defined with reference to the center of the

sphere and extending in a direction orthogonal to the maximum circumferential length, the collimating angle being the half-aperture angle of the arc of said electrode width orthogonal to said first direction, at which collimating angle a collimated beam of surface acoustic waves can be obtained,

wherein the electrode width of said comb-like electrode (14c) is obtained as the maximum circumferential length of the sphere, multiplied by two times said collimating angle, divided by two time Pi, and wherein the electrode width is not less than 1/100 of the radius and not more than the radius,

wherein in such configuration, the surface acoustic wave generator (14, 14a, 14b, 14c) generates surface acoustic waves on the circular continuous surface portion along said first direction in such manner that the surface acoustic waves propagate along the first direction in a range confined to the electrode width of said electrode (14c) as collimated beams."

V. The appellant essentially argued as follows:

The amendments to the application in the form of the main request had a clear basis in the claims and description of the original application.

The amended independent claim 1 defined all of the parameters of the device. Moreover it clearly defined the manner in which the collimation effect was achieved, in such a manner that the requirements established in the case law for a functional definition to be allowable were satisfied.

The subject-matter of claim 1 was new and involved an inventive step because the cited prior art disclosed

only surface acoustic wave devices formed on planar or cylindrical substrates, which did not provide the collimation effect resulting from the use of a spherical substrate, as defined in the claim.

Reasons for the Decision

1. The appeal is admissible.

2. The amended independent claim 1 according to the appellant's main request has a basis in the originally filed claims 1, 6 and 9, in combination with paragraphs [0032], [0045] and [0050] of the description (of the published application). The dependent claim 2 is based on paragraph [0040] of the description, and dependent claims 3 to 6 are equivalent to original claims 3, 2, 4 and 12 respectively. The amendments to the description consist in the acknowledgement of the relevant prior art, replacement of the citation of original claim 1 with a reference to the present claims, and the deletion of passages which are not consistent with the present claims. The application according to the main request therefore meets the requirements of Article 123(2) EPC.

3. The amendments to the independent claim 1 carried out during the course of the appeal procedure result in the objections of lack of clarity in the decision under appeal being overcome. In particular, the first two paragraphs of the characterising portion of the claim express clearly that the surface acoustic waves generated by the device propagate along a great circle of a spherical surface. The following four paragraphs

then specify how the dimensions of the electrodes of the surface acoustic wave generator are selected in order to achieve the function of collimation defined in the final paragraph of the claim. The board shares the opinion of the appellant that this form of definition meets the requirements established in the case law for a functional definition to be allowable. Contrary to the opinion expressed in the decision under appeal, the board considers that, in the light of the complexity of the mathematical procedures disclosed in the application for determination of the collimating angle, in particular in paragraphs [0037] to [0047] in combination with figures 2 and 3, it would not be appropriate to attempt to define these procedures in the claim. The board is therefore of the opinion that the claims of the appellant's main request are clear within the meaning of Article 84 EPC.

4. In the light of the amendments discussed in the previous paragraph, the board also considers that the subject-matter of claim 1 of the main request is new and involves an inventive step. The objection of lack of novelty in the decision under appeal is no longer valid, because the claim now clearly specifies that the surface acoustic waves propagate on part of a spherical surface as a collimated beam. By contrast, in document D1 cited in the decision under appeal, the curved parts of the surface are cylindrical, not spherical, such that no collimation effect is achieved. The documents D2 and D3 cited during the procedure before the examining division are similar in this respect to D1. The only cited prior art document which discloses surface acoustic waves propagating on a spherical surface is D4, but that concerns an entirely different technology, using a metal sphere with generation and detection of the acoustic waves by optical rather than

electrical means. It also provides no suggestion that it might be possible to achieve the collimation effect underlying the claimed invention. The board therefore concludes that the prior art contains no teaching which would render the claimed subject-matter obvious. The subject-matter of claim 1 of the appellant's main request is therefore new within the meaning of Article 54 EPC, and involves an inventive step according to Article 56 EPC.

5. Claims 2 to 6 are dependent on claim 1, so that their subject-matter is also new and involves an inventive step. The description has been adapted so as to meet the remaining relevant requirements of the EPC. The board therefore concludes that this request provides a basis for the grant of a patent. It was therefore not necessary to consider the appellant's auxiliary requests.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent in the following version:

   Claims: 1 to 6 of the main request filed during the oral proceedings of 2 December 2014;
   Description: pages 4, 6, 7, 9, 16, 22 and 23 filed during the oral proceedings of 2 December 2014; pages 1 to 3, 5, 8, 10 to 15, 17 to 21, 24 to 28 as originally filed;
   Drawings: sheets 1/4 to 4/4 as originally filed.

The Registrar: The Chairman:

U. Bultmann M. Ruggiu

Decision electronically authenticated