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**Datasheet for the decision
of 10 March 2008**

Case Number: T 0466/04 - 3.5.04

Application Number: 98303279.8

Publication Number: 0902423

IPC: G11B 7/00

Language of the proceedings: EN

Title of invention:

Objective lens driving device for an optical pick-up unit

Patentee:

SAMSUNG ELECTRONICS CO., LTD.

Opponent:

Koninklijke Philips Electronics N.V.

Headword:

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Relevant legal provisions:

-

Relevant legal provisions (EPC 1973):

EPC Art. 56

Keyword:

"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 0466/04 - 3.5.04

D E C I S I O N
of the Technical Board of Appeal 3.5.04
of 10 March 2008

Appellant: Koninklijke Philips Electronics N.V.
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
11 February 2004 concerning maintenance of
European patent No. 0902423 in amended form.

Composition of the Board:

Chairman: F. Edlinger
Members: M. Paci
T. Karamanli

Summary of Facts and Submissions

- I. This is an appeal by the opponent against the interlocutory decision of the opposition division that European patent No. 0 902 423 as amended met the requirements of the EPC.
- II. Opposition had been filed against the patent as a whole and was based on Articles 100(a) and 100(c) EPC 1973 on the grounds of lack of inventive step and added subject-matter.
- III. The following documents had been cited *inter alia* as prior art in the notice of opposition:

D2: EP 0 464 912 A1 and

D3: EP 0 617 419 A1.

The opponent also alleged in the opposition procedure that in 1995, that is before the priority date of the patent, it sold Philips CDM 12 scanning devices (hereinafter "prior sold devices CDM 12") to several customers. The following written supporting evidence was filed *inter alia*:

E1: Technical drawings "Sam aktuator" ref. no.
3104 148 0057 (110-1),

E2: Technical drawings "Sam aktuator" ref. no.
3104 148 0057 (110-2),

E3: Technical drawings "Focus coil former" ref. no.
3104 144 0019,

E4: Technical drawings "Lens holder" ref. no.
3104 144 0213,

- E5: Technical drawings "Focus coil" ref. no.
3122 138 6380 and
E6: Technical drawings "Radial coil" ref. no.
3122 138 6379.

IV. In the decision under appeal the opposition division held that the objection of added subject-matter under Article 100(c) EPC 1973 had been overcome by the deletion of the contested passage in the description of the patent. As to the objection of lack of inventive step under Article 100(a) EPC 1973, the opposition division concluded that the device of claim 1 and the method of claim 3 were not rendered obvious by the cited prior art, in particular the disclosures of D2, D3 and the alleged prior use. D2 and the alleged prior use were regarded as having the same technical content and were thus referred to jointly in the reasons for the decision.

V. During appeal proceedings the appellant (opponent) contested the opposition division's decision on the basis that the subject-matter of claims 1 to 3 did not involve an inventive step in view of D3 and the disclosure of either D2 or the prior use. The following additional written evidence was filed in support of the alleged prior use *inter alia*:

- E7: Composition drawing of the CDM 12 device.

VI. Oral proceedings were held on 10 March 2008 at the end of which the board's decision was announced.

- VII. The appellant's final request is that the decision under appeal be set aside and that the patent be revoked.
- VIII. The respondent's (patentee's) final requests are that the appeal be dismissed, or in the alternative, that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the first, second or third auxiliary requests, all filed with letter dated 8 February 2008.
- IX. Claims 1 and 3 according to the patent in amended form as maintained by the opposition division read as follows:

"1. An objective lens driving device including a base (100), a permanent magnet (102) and a yoke (101) which are installed on the base (100) for forming a magnetic field, a holder (10) fixed on the base, and a movable supporter (12, 13) on which an objective lens (11) is mounted and which is provided with focusing (15) and tracking (14) coils each having lead wires (15a, 14a) respectively, the objective lens driving device comprising electrical terminals (10a-10d),

a plurality of suspensions (16) for supporting the movable supporter (12, 13), and for electrically connecting the focusing coil (15) and the tracking coil (14) with respective control signal sources, one end of each of the suspensions (16) being fixed to the holder (10) and being electrically connected to the corresponding electrical terminals (10a-10d) and the other end being electrically connected to corresponding ends of the lead wires, characterised in that said movable supporter comprises separate first and second

movable supporters (12, 13) and first and second protrusions (12a, 13a) formed on said first and second movable supporters (12, 13) respectively around which lead wires (14a, 15a) of the tracking coil (14) and the focusing coil (15) are wound respectively."

"3. A method of assembling an objective lens driving device including a base (100), a permanent magnet (102) and a yoke (101, comprising installing the magnet (102) and yoke (101), on the base (100) for forming a magnetic field, fixing on the base a holder (10) with electrical terminals (10a-10d) and supporting a movable supporter (12, 13), which is mounted an objective lens (11), by means of a plurality of suspensions (16), said movable supporter being provided with tracking coil (14) and focusing coil (15) having lead wires (14a, 15a) respectively, electrically connecting said suspensions (16) between said lead wires and said electrical terminals, characterised in that the method includes the steps of winding the tracking coil (14) around a first movable supporter (12) and the lead wire (14a) thereof around a first protrusion (12a) of said first movable supporter (12), winding the focusing coil (15) around a separate, second movable supporter (13) and the lead wire (15a) thereof around a second protrusion (13a) of said second movable supporter (13) and thereafter bonding said first and second movable supporters (12, 13) together to form said movable supporter."

X. The appellant essentially argued as follows.

The subject-matter of claim 1 does not involve an inventive step in view of the disclosure of D3 and that of either D2 or the public prior use.

Starting from D3

The device of claim 1 differs from the device of D3 in that the movable supporter in claim 1 comprises separate first and second movable supporters, wherein first protrusions are formed on the first movable supporter and second protrusions are formed on the second movable supporter, and wherein the lead wires of the tracking coil are wound around the first protrusions and the lead wires of the focusing coil are wound around the second protrusions.

The device according to D2 and the prior sold devices CDM 12, which have essentially the same technical structure, comprise an alternative construction for the movable supporter of D3 which has all the features of the movable supporter in claim 1. This alternative construction has the advantage of facilitating the winding of the tracking and focusing coils by an automated process. The skilled person would thus want to use the movable supporter of D2 in the device of D3, which could be done without substantial constructional changes, thereby arriving at the subject-matter of claim 1 without having exercised an inventive step.

Starting from either D2 or the public prior use

The device of claim 1 differs from the device of D2 (or from the prior sold devices CDM 12) in that the suspensions are used for electrically connecting the focusing coil and the tracking coil with respective control signal sources.

The device of D3 uses conductive leaf springs as suspensions for the movable supporter. These leaf springs also electrically connect the focusing coil and the tracking coil to respective control signal sources, thereby removing the need for additional wires for the electrical connection. It would be obvious for the skilled person to apply the teaching of D3 to the device of D2 (or to the prior sold devices CDM 12), thereby arriving at the subject-matter of claim 1.

XI. The respondent's arguments can be summarised as follows.

Starting from D3

A person skilled in the art would not combine the teachings of D3 and D2, which address different problems. D3 aims at avoiding loose wires between terminal pins of the coils and the base. D2 teaches nothing in this respect. The introduction of the highly modular movable supporter of D2 (or of the prior sold devices CDM 12) into the device of D3 would present the skilled person with further problems which he would not be able to surmount and which would require substantial rearrangement of the device.

Starting from either D2 or the public prior use

Replacing the suspension of D2 (or of one of the prior sold devices CDM12) with electrically conductive leaf springs, as suggested by D3, would create the problem that the protrusions on the movable supporter would have to be completely rearranged so as to make electrical contact with the suspensions. These changes would require a complete redesign of the whole construction. Moreover it is doubtful whether the skilled person would replace the existing suspensions, thus forgoing the advantages associated with the suspensions of D2 (see column 3, lines 4 to 11). These advantages would probably dissuade him from looking for alternative structures in the state of the art.

Reasons for the Decision

1. The present decision was taken after the revised European Patent Convention ("EPC 2000") entered into force on 13 December 2007. Since the European patent in suit was already granted at that time, the Board applied the transitional provisions in accordance with Article 7(1), second sentence, of the Act revising the EPC of 29 November 2000 and the Decisions of the Administrative Council of 28 June 2001 (Special edition No. 1, OJ EPO 2007, 197) and 7 December 2006 (Special edition No. 1, OJ EPO 2007, 89). Articles and Rules of the revised EPC and of the EPC valid until that time are cited in accordance with the Citation Practice (see the 13th edition of the European Patent Convention, page 4).

2. The appeal is admissible.

Interpretation of claim 1 according to the patent in amended form as maintained by the opposition division

3. Before examining novelty and inventive step, it is necessary to construe a claim in the light of the description and drawings in order to determine its technical features and the subject-matter for which protection is sought.
4. The characterising portion of claim 1 needs some consideration in respect of the feature "*separate first and second movable supporters*" and the protrusions around which the lead wires of the coils are wound.
5. Regarding the interpretation of the term "separate", there is no doubt for the skilled person, in the light of the description as amended in opposition proceedings and the drawings of the patent and in view of the method of claim 3, that the first and second movable supporters (12, 13) are separate parts at some stage during the assembling process of the objective lens driving device and that they are fixed together (e.g. bonded) to form the movable supporter in the assembled device (see page 5, lines 11 to 13, and page 6, lines 1 to 12, corresponding to column 3, lines 21 to 24 and lines 44 to 55, of the patent specification). The term "separate" in the context of claim 1 should thus be construed as meaning that it can be seen upon examination of the assembled objective lens driving device that the first and second movable supporters are two separate elements which were fixed together during the assembling process.

6. Regarding the position of the tracking and focusing coils, claim 1 specifies that lead wires of the tracking coil are wound around first protrusions (12a) formed on the first movable supporter (12) and that lead wires of the focusing coil are wound around second protrusions (13a) formed on the second movable supporter (13). The claim does not explicitly state that each coil is provided on the same movable supporter as the protrusions to which its lead wires are connected. The description and drawings (see page 6, lines 1 to 12, and figure 3) and the method of claim 3 however leave no doubt that the tracking coil is provided (like the first protrusions) on the first movable supporter and that the focusing coil is provided (like the second protrusions) on the second movable supporter. The electrical connection of the lead wires to corresponding protrusions on the same part allows for easy winding on separate supporters before fixing the supporters together during the assembling process (see point 5 above). Any other interpretation would make no technical sense in the context of the present invention.

Novelty

7. The novelty of the subject-matter of the claims has not been disputed by the appellant. The board also sees no reason to question novelty in view of the state of the art submitted by the appellant.

Inventive step

8. *Starting from D2*

8.1 D2 is prior art under Article 54(2) EPC 1973. It discloses an objective lens driving device presented as being easier to manufacture and having a smaller overall height than existing similar devices (see column 1, lines 36 to 56). The device (see figure 1) comprises a stationary section and a movable supporter. The stationary section includes a base (16), a permanent magnet (18), a yoke (16, 16a) and a holder (16, 34) fixed on the base. The movable supporter comprises a lens holder (4) holding an objective lens (2), a focusing coil (12) wound around a focusing coil holder (8) and two tracking coil holders (10a, 10b) around which a dual tracking coil (14a, 14b) is wound. The lens holder, the two tracking coil holders and the focusing coil holder are mechanically interconnected during the assembling process, for example by means of snap-in connections (shown on figure 1), in order to form the movable supporter (see column 5, lines 7 to 9). In the assembled device the movable supporter can thus be regarded as comprising a first movable supporter (formed of 10a, 4 and 10b interconnected by the snap-in connections) on which the dual tracking coil (14a, 14b) is provided and a second movable supporter (8) on which the focusing coil (12) is provided. The first and second movable supporters are further provided with pin-shaped protrusions (see figure 1), the function of which is not disclosed. The movable supporter is mounted on the holder (16, 34) of the stationary section by two suspensions (22a, 22b). Each suspension is preferably made of plastic and has two parallel

horizontal suspension rods (26a, 28a; 26b, 28b) provided with a double integral hinge (28) at their respective ends (see column 5, lines 53 to 57). D2 does not explicitly state how the tracking and focusing coils are electrically connected. However the board regards it as implicit that these coils must have lead wires connecting them to electrical terminals (and further down the line to control signal sources) on the stationary section because there is no power source on the movable supporter.

8.2 The device of claim 1 thus only **differs** from the device disclosed in D2 by the following features:

- (a) the suspensions, in addition to supporting the movable supporter, also electrically connect the lead wires of the focusing and tracking coils to corresponding electrical terminals somewhere on the base, one end of each of the suspensions being fixed to the holder and electrically connected to a corresponding terminal and the other end being electrically connected to the corresponding end of the lead wire; and
- (b) lead wires of the tracking coil are wound around first protrusions formed on the first movable supporter and lead wires of the focusing coil are wound around second protrusions formed on the second movable supporter.

8.3 Both features (a) and (b) contribute to solving the **objective technical problem** of facilitating the assembly of electrical connections between control signal sources and the tracking and focusing coils (see

page 2, line 32, to page 3, line 4, corresponding to paragraph [0006] of the patent specification).

- 8.4 Feature (b), taken on its own, is regarded as obvious from the disclosure of D2 because the tracking coil holder (10a, 10b) and the focusing coil holder (8) both have pin-shaped protrusions (see figure 1) which, even though their function is not disclosed in D2, strongly suggest that they are meant for winding the ends of the lead wires of the coils around them.
- 8.5 Regarding feature (a), the appellant submitted that this feature was suggested by the teaching of D3.
- 8.6 D3, which is prior art under Article 54(2) EPC 1973, discloses an objective lens driving device in which the wiring of the coils wound around a coil bobbin can be easily performed, and the assembly can be automated (see column 1, lines 53 to 57). The device (see figures 2 and 3) comprises a stationary member and a movable supporter. The stationary member includes a base on which a holder (14) is fixed (see column 3, lines 12 to 19). The movable supporter comprises a lens holder (11) for holding an objective lens and a coil bobbin (12) mounted on the lens holder. A focusing coil and a tracking coil are wound around the coil bobbin. The respective wire ends of the focusing and tracking coils are wound around four terminal pins (12a) provided on the coil bobbin (see column 3, lines 30 to 34). The movable supporter is elastically supported on the stationary member by four electrically conductive leaf springs (13) for connecting the focusing and tracking coils to electrical terminals on the stationary member (see column 3, lines 39 to 51). The four terminal pins

around which the wire ends of the focusing and tracking coils are wound are soldered for electrical connection to four enlarged end portions (13a) of the four leaf springs.

D3 thus discloses a plurality of suspensions according to feature (a), that is a plurality of leaf springs (13) for supporting the movable supporter and for electrically connecting the tracking and focusing coils to electrical terminals somewhere on the base.

8.7 According to established jurisprudence of the boards of appeal, in order to rule out *ex post facto* analysis of the invention, the question to be answered is not whether the skilled person **could** have arrived at the invention by adapting or modifying the closest prior art, but whether he **would** have done so in the hope of solving the objective technical problem or in expectation of some improvement or advantage (see Case Law of the Boards of Appeal of European patent office, 5th edition 2006, I.D.5).

8.8 In the present case the specific construction of the suspension of D2 is presented as particularly advantageous and appears to lie at the core of the invention described in D2. The stated goal of the invention of D2 is to improve the scanning device of the prior art so as to obtain an easy-to-manufacture scanning device of suitable shape and of small overall height (see column 1, lines 52 to 56). The two suspensions (22a, 22b) have a particular structure: each suspension is an integral injection-moulded product preferably made of plastics and comprising two suspension rods (26a, 28a) linked together by two

connecting portions (30, 31). Each suspension rod has a double integral hinge (28) at each end, thereby allowing movement both about an axis extending in the focusing direction and about an axis extending in the tracking direction (see column 5, line 53, to column 6, line 17). The structure is described in column 3, lines 4 to 11, of D2 as having the following advantages: "*An advantage of this embodiment is that it allows such a stiffness to be selected for the suspension that any resonant frequencies resulting from a possible unbalance are low in relation to the desired bandwidth of the control system. This suspension can be manufactured by means of an injection-moulding process and can be mounted in a simple manner*". And in column 6, lines 20 to 29, of D2 it is further stated that: "*An advantage of this is that a satisfactory compromise is obtained between the susceptibility to shocks produced outside the slide carrying the scanning device and the susceptibility to disturbances originating from the slide itself. This is of particular importance if a slide-drive system is employed. The suspension itself is particularly advantageous on account of its inherent damping characteristics and its simple manufacturing and assembly possibilities*". No alternative to this advantageous structure of the suspension is disclosed in D2.

- 8.9 The fact that the suspension is presented in D2 as having many advantages would thus *a priori* deter the skilled person from replacing it by another kind of suspension which does not have the desired properties at absorbing shocks and other disturbances. Rather the person skilled in the art would use the pin-shaped protrusions to electrically connect the lead wires of

the coils (see point 8.4 above) and connect the end wires at the protrusions to terminals of the base, for instance by short electrical wires. Since the protrusions in D2 are all arranged at the side of and close to the base (see figure 1), they do not present the same problem as the loose wires in the different construction shown in figure 1 of D3, which is a problem addressed in D3 (column 1, lines 42 to 56). In doing so the advantageous suspension rods may be retained.

8.10 Moreover, replacing the suspension of D2 by that of D3 in the device of D2 would not be possible without substantial changes to the structure of the movable supporter of D2. In D3 the lens holder (11) is moulded around the conductive leaf springs (13), a different approach from the snap-in connections (34, 36) in D2 which would not be easily combined with that of D3, and thus unlikely to be undertaken by the skilled person. As to the movable supporter of D3, it teaches away from the device of claim 1 because all the protrusions around which the ends of the lead wires of the tracking and focusing coils are wound are on the same coil bobbin (12), not on separate first and second movable supporters. Thus the movable supporter of D3 would guide the skilled person away from the device of claim 1 if he tried to solve the objective technical problem to facilitate the assembly of electrical connections (see point 8.3 above).

8.11 For the above reasons the board considers that, starting from D2 and taking into account the disclosure of D3, the skilled person would not have arrived at the device of claim 1 without an inventive step.

9. *Starting from D3*

9.1 In the light of the above analysis (see point 8.6), the objective lens driving device of claim 1 **differs** from that of D3 by the following features:

- (c) a permanent magnet and a yoke installed on the base for forming a magnetic field; and
- (d) lead wires of the tracking coil wound around first protrusions on a first movable supporter, and lead wires of the focusing coil wound around second protrusions on a second movable supporter **separate** from the first movable supporter.

9.2 Feature (c) is not mentioned in D3 but would be the usual way of generating a magnetic field in an objective lens driving device.

9.3 Feature (d) contributes to solving the **objective technical problem** of facilitating the assembly of electrical connections between control signal sources and the focusing and tracking coils by an automated process (see page 2, lines 11 to 19; page 2, line 32 to page 3, line 4; page 6, lines 1 to 12; and page 6, line 26 to page 7, line 4 corresponding to paragraphs [0004], [0006], [0015] and [0017] of the patent specification).

9.4 Regarding feature (d), both the dual tracking coil and the focusing coil of D3 are wound around a coil bobbin (12). As can be derived from figures 2 and 3 of D3, the focusing coil (not shown) is wound around the main part of the coil bobbin whereas the dual tracking coil is wound around a two-part tracking coil holder protruding

from the main part of the coil bobbin. There is no disclosure in D3 that the tracking coil holder was separate from the main part of the coil bobbin at any stage during the assembling process. The skilled person might have considered providing the tracking coil holder as a separate element before attaching it to the main part of the coil bobbin (for example by bonding or snap-in connection) in order to facilitate the winding of the tracking and focusing coils. Nevertheless, even if the skilled person had done so, the protrusions (12a) on which the lead wires of both the tracking and focusing coils are wound, would still all be arranged on the main part of the coil bobbin. None would be on the tracking coil holder. The protrusions could not be arranged on the tracking coil holder anyway because there is not enough space. Hence feature (d) cannot be derived from the disclosure of D3 alone without an inventive step.

- 9.5 The appellant submitted that feature (d) was obvious in view of the disclosure of D2.
- 9.6 The relevant question is thus whether the skilled person starting from the device in D3 would have found a hint in the disclosure of D2 (see points 8.1 and 8.4 above) that providing protrusions and electrical connections on separate parts as specified in feature (d) would advantageously solve the problem of facilitating the assembly of electrical connections by an automated process (see point 9.3 above) in the device of D3. There are good reasons to doubt that he would have.

Firstly, D3 (column 1, lines 42 to 56) sets out the objective of avoiding loose wires between coils and base members. Short loose wires in combination with protrusions located near the base would probably be the solution retained in D2 (see point 8.4 above). Since D2 does not disclose any specific electrical connection to the base terminals, it is difficult to see why a person skilled in the art would get a hint at providing electrical connections as specified in feature (d), or at combining D2 with D3 at all. Moreover little emphasis is put in D2 on the modular structure, interconnected by snap-in connections or the like, of the movable supporter. The sole mentioned advantage does not refer specifically to the movable supporter but generally to the whole device as being "*constructed in such a manner that the production process can be almost fully mechanized for large-quantity production at minimal costs*" (see column 4, lines 53 to 56). The skilled person would thus not have seen an advantage in adopting the structure of the movable supporter of D2, in particular to rearrange the protrusions of the coil bobbin in D3 as specified in present claim 1. This would require substantial structural changes for similar reasons as set out above (see point 8.10).

Secondly, the core of the invention in D2 resides in the specific structure of the electrically non-conductive double-hinged suspensions (22a, 22b) having particularly advantageous damping characteristics, as already explained under point 8.8 above. The main teaching of D2 is thus to use suspensions radically different from the electrically conductive leaf springs of D3, which would deter the skilled person from

combining the movable supporter of D2 with leaf springs such as in D3.

In view of the above, the board is not convinced that the disclosure of D2 contains any teaching which would have prompted the skilled person to import and adapt the movable supporter of D2 into the device of D3 in expectation of some improvement or advantage.

- 9.7 Hence the subject-matter of claim 1 is not rendered obvious when starting from D3 and taking into account the disclosure of D2.
10. The above conclusions also apply to the subject-matter of claim 2 dependent on claim 1 and to that of claim 3, which relates to a method of assembling an objective lens device having features corresponding to those of claim 1.
11. *Alleged public prior use*
- 11.1 In a letter of 8 February 2008 the appellant explicitly stated that "the disclosure in document D2 is to be equated to what is disclosed by the alleged prior use instances of CDM 12 devices".
The technical drawings filed as written evidence in support of the alleged prior use are however more detailed than the corresponding drawings of D2 in that they show the lead wires of the tracking and focusing coils wound around pin-shaped protrusions shown in figure 1 of D2. Since this feature was regarded by the board as the most likely interpretation of the intended purpose of the protrusions in view of the disclosure of D2 itself (see points 8.4 and 9.6 above), the

conclusions as to inventive step reached based on the disclosure of D2 apply equally to the prior sold devices CDM 12 allegedly having the structure shown in the technical drawings E1 to E7.

11.2 Since the board concludes that the disclosure of the alleged public prior use would not render the subject-matter of any of the claims obvious, even in combination with the disclosure of D3, the alleged public prior use would not prejudice the maintenance of the patent in amended form even if it were proven. Therefore it is unnecessary for the board to examine whether the alleged public prior use was sufficiently proven.

11.3 It follows from the foregoing that the subject-matter of claims 1 to 3 involves an inventive step in accordance with Article 56 EPC 1973 in view of the state of the art submitted by the appellant. Thus there is no need to examine the first to third auxiliary requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

D. Sauter

F. Edlinger