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D E C I S I O N
of 18 January 1994

Case Number: T 0235/92 - 3.4.2

Application Number: 87106087.7

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IPC: G03G 15/04, G03B 27/54

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Title of invention:
Document scanning optical device

Patentee:
Mita Industrial Co. Ltd.

Opponent:
Xerox Corporation

Headword:
-

Relevant legal norms:
EPC Art. 56

Keyword:
"Interpretation of Claim 1 to avoid contradictions"
"Inventive step - no"

Decisions cited:
-

Catchword:



Case Number: T 0235/92 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 18 January 1994

Appellant: Xerox Corporation
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office dated 15 January 1992
rejecting the opposition filed against European
patent No. 0 245 685 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: E. Turrini
Members: W.W.G. Hofmann
J. Saisset

Summary of Facts and Submissions

- I. The Appellant (Opponent) lodged an appeal against the decision of the Opposition Division to reject the opposition against the patent No. 0 245 685.

The Opposition Division had expressed the view that the grounds for opposition mentioned in Article 100 EPC did not prejudice the maintenance of the patent unamended, having regard, in particular, to the documents

(D1) EP-A-0 010 124, and
(D2) WO 81/00771.

- II. In the grounds of appeal, the Appellant moreover cited, among others, the document

(D5) US-A-3 532 424.

- III. Oral proceedings were held at the end of which the Appellant requested that the decision under appeal be set aside and the patent revoked.

The Respondent (Patentee) requested that the appeal be dismissed and the patent maintained as granted.

- IV. The wording of Claim 1 on file at the time of the decision reads as follows:

"1. A document scanning optical device comprising a document illuminating means having an illuminating lamp (12), a main reflecting means (14) partly surrounding the illuminating lamp, and a subsidiary reflecting means (16) disposed opposite to the illuminating lamp and the main reflecting means said illuminating means being adapted to illuminate a document via a first

illuminating light path (28) from one side of the plane which is defined by the scan light reflected from the document, without reflection by the subsidiary reflecting means, and at the same time, to illuminate the document via a second illuminating light path (30) from the other side of said plane with reflection by the subsidiary reflecting means, characterised in that the subsidiary reflecting means (16) has a larger reflectance than the main reflecting means (14) in order to adjust the difference between the first quantity (L1) of light illuminating the document via the first illuminating light path and the second quantity (L2) of light illuminating the document via the second illuminating light path to not more than 15 % of the sum of the first quantity (L1) and the second quantity (L2)."

Claims 2 to 5 are dependent on Claim 1.

V. The Appellant essentially argued as follows:

The idea on which according to the Respondent the patent in suit is based, i.e. to play with the reflectivities of the reflecting means in order to adjust the quantities of light illuminating the document via the two different light paths, is not inventive since the dependence of the beam intensities on the reflectivities of the reflectors is the first thing a skilled person would think of if he is interested in the intensities of reflected light beams. The teaching that the two quantities of light should be made substantially equal already follows for the skilled person from simple symmetry considerations, but is also clearly expressed in the prior art (D2). If the skilled person sees that - as in the case of the comparative example of the patent in suit - the reflectance of the reflector inserted in one of the light paths is particularly low, he will

naturally make this reflectance higher. Moreover, whether by any choice of the reflectances a balance between the quantities of light from the two light paths can be achieved, depends on the geometry of the parts of the optical device and their arrangement, none of which features are specified in Claim 1.

VI. The arguments presented by the Respondent are in substance as follows:

If the relation between the reflectances of the subsidiary and the main reflecting means defined in Claim 1 at first sight appears to be irrelevant, this indicates that the claimed features are not obvious. Moreover, in none of the prior art documents is there any suggestion that the subsidiary reflecting means should have a larger reflectance than the main reflecting means. The teaching given in Claim 1 is sufficient since the feature that the reflectance of the subsidiary reflecting means is larger than that of the main reflecting means is complemented by the condition that the difference between the two light quantities illuminating the document via the first and second light paths is not more than 15%. Moreover, minor changes in the arrangement which might be necessary for successfully adapting the claimed device to the problem to be solved, may be left open in Claim 1. An independent claim does not have to specify every constructional detail. The main teaching of Claim 1 is to play with the reflectances if one wants to equalize the intensities of the two illuminating beams. D2 leads away from this teaching since it proposes an additional reflector for obtaining a balance between the said intensities.

Reasons for the Decision

1. The appeal is admissible.
2. *Interpretation of Claim 1*

Claim 1 needs interpretation since, as shown below, not all conceivable ways of understanding the condition, contained in its characterising portion, that the subsidiary reflecting means should have a larger reflectance than the main reflecting means, are free of contradictions.

- 2.1 One way of fulfilling the condition of Claim 1 is to choose a high value for the reflectance of the subsidiary reflector (higher than the average reflectance of the reflectors in an optical device of this kind). Interpreted in this way, the said condition promotes a higher rate of light transmission along the second illuminating path and thus, under normal conditions, tends to equalize the two "quantities of light" illuminating the document via the two illuminating paths. No contradiction arises in this case.
- 2.2 The condition of Claim 1 concerning the reflectances could alternatively also be fulfilled by reducing the reflectance of the main reflector (while maintaining or also reducing the reflectance of the subsidiary reflector). Since under normal conditions (e.g. according to Figures 1 and 4 of the patent in suit as well as according to D2) the light reflected by the main reflector contributes - in addition to the light coming directly from the lamp - to both the beam going directly to the document and the beam going to the subsidiary reflector, the reduction of this part (reflected from

the main reflector) of the light going to both beams will normally leave the imbalance of the light intensities of the two beams unchanged. It may of course, under different, particular circumstances, also tend to increase the imbalance or to reduce it. In which direction the effect of a reduction of the reflectance of the main reflector goes (and whether in this way a balance of the said quantities of light to within 15% can be reached), depends on the percentage in which the light reflected from the main reflector is distributed to the one and the other of the said two beams. Such a percentage of distribution or the corresponding constructional data of the optical device are, however, neither mentioned in Claim 1, nor anywhere else in the patent specification.

Under normal circumstances (and nothing else is disclosed), the reduction of the reflectance of the main reflector (without increase of the reflection of the subsidiary reflector) therefore does not allow to reach, or even to go in the direction towards, the limit of 15% for the difference of the two "quantities of light", prescribed in Claim 1. Thus, this way of trying to fulfil the condition set in Claim 1 leads to a contradiction within the claim.

- 2.3 The Respondent has argued that if the condition in Claim 1 relating to the reflectance of the main reflector appears not to be reasonable in all of its aspects, this only comes from regarding this feature in isolation. This feature should be read in conjunction with the condition that the difference of the quantities of light should be not more than 15%, and in conjunction with further features not mentioned in Claim 1 since the skilled reader would be able to find them for himself

(it was not required to indicate in Claim 1 every constructional detail playing a role in the functioning of the device).

In its above considerations, the Board took into account the condition regarding the difference of the quantities of light and stated that this condition gave rise to a contradiction. It cannot be fully excluded that some special construction of an optical device as claimed may exist, such that for this special construction the reduction of the reflectance of the main reflector could promote the balance of the quantities of light. However, constructional features of this kind are not only lacking in Claim 1, they also cannot be found anywhere else in the documents of the patent in suit (the constructional features of the examples point in the opposite direction), and they are also not usual in the state of the art in the sense that they could be considered to be implicitly comprised in the teaching of the patent. This indicates that the patent was not intended to relate to such special constructions. Under these circumstances, contrary to the Respondent's argument, it cannot be left to the skilled person to deviate from the examples of the patent and find the said features for himself, in order to render the definitions of Claim 1 free of contradiction regarding all their possible interpretations.

Thus, Claim 1 cannot be interpreted in the sense that a reduction of the reflectance of the main reflector may play a role, but only in the sense that an increase of the reflectance of the subsidiary reflector is proposed.

3. Novelty

3.1 D1 (cf. in particular the abstract and Figure 1) discloses a document illuminating optical device having most of the features of the precharacterising portion of present Claim 1.

However, it does not relate to a scanning optical device. The subsidiary reflector 13 is "aluminum coated ... to produce high efficiency diversion of the impinging light rays" (cf. page 4, lines 28 to 36), but no adjustment of the difference between the two quantities of light to not more than 15% of the sum of both light quantities is mentioned.

(It should be mentioned that the subject-matter of Claim 1 is not distinguished from the known apparatus by the number of subsidiary reflectors (which are two in the case of D1) since the wording of Claim 1 only excludes that the light of the "first illuminating light path" is reflected at the subsidiary reflecting means 16.)

3.2 D2 (cf. in particular page 2, lines 6 to 18; Figure 2 and corresponding description) describes a document scanning optical device which has all the features specified in the precharacterising portion of Claim 1, in particular an illuminating lamp, a main reflecting means partly surrounding the lamp, and a subsidiary reflecting means disposed opposite to the lamp, the illuminating means illuminating the document from one side via a light path not reflected by the subsidiary reflecting means and from the other side via a light path reflected by the subsidiary reflecting means.

It is expressed in D2 that the light intensities of the two light beams should be balanced, i.e. made substantially equal (cf. abstract, page 1, lines 23 to 27; page 2, lines 26, 27; page 5, lines 21, 22) and that the reflectance of the subsidiary reflector should be high (cf. page 1, lines 20 to 23 and page 3, lines 29 to 31). However, no limit of 15% is given for the degree of balance of the two light intensities.

3.3 The teaching of D5 does not come closer to the claimed subject-matter since - although it relates to a scanning optical device providing two-beam illumination of a three-dimensional original document via mirrors in order to avoid shadows - it does not specifically mention light intensities and reflectances.

3.4 Therefore, having regard to the above-mentioned prior art, the device according to Claim 1 is new in the sense of Article 54(1) EPC.

4. *Inventive step*

4.1 It ensues from the above analysis that D2 represents the prior art document closest to the subject-matter of the present Claim 1.

In addition to most of the features as claimed, the problem indicated in the patent in suit (cf. column 1, lines 32 to 38, 48 and 49; column 2, lines 15 to 19), i.e. to avoid shadows in the resulting copy caused by differences in the surface level of the document without greatly increasing the cost of production, is also, in essence, already known from and solved in D2 (cf. page 1, lines 8 to 27). (It is clear that such shadows may be caused by differences in the surface level of documents (cf. also D5, e.g. column 2, lines 8 to 10.)

4.2 For solving this problem, Claim 1 provides that (keeping to the only contradiction-free interpretation, cf. paragraphs 2.1 to 2.3 above) the reflectance of the subsidiary reflecting means should be increased in order to reach equality of the said two quantities of light at least within the limits of 15%.

This solution of the problem is, however, obvious in view of the teaching of D2. D2 teaches that the said two quantities of light should be balanced (page 1, lines 25 to 27) and that the transmission loss of the reflector reflecting the light beam is the cause for its lower energy as compared with the non-reflected light (page 1, lines 20 to 25). This teaching directly implies for the skilled reader that it would be desirable to choose the reflectance of the reflector for the non-direct beam as high as possible, i.e. if possible higher than average values of the reflectance since even losses of about 10%, corresponding to a reflectance of 90%, are considered excessive.

The feature that the difference between the two quantities of light should not be larger than 15%, also cannot contribute to the inventive step of the claimed subject-matter. Setting the particular limit of 15% does not lead to a better reduction of shadows, but only defines the problem of obtaining a balance between the two light quantities in more detail. D2 clearly aims at a balance of better than 10% (since the losses of 10% mentioned on page 1, line 22 are indicated to be too much), and it is clear according to D2 as well as according to the patent in suit (cf. Claim 3) that a zero difference is the most desirable. On the other hand, it is obvious that shadows do not appear suddenly at a certain percentage of imbalance, but gradually, so that no unexpected change occurs at the particular limit of 15% and the average skilled person has no difficulty

to choose the limit of imbalance (and consequently of the darkness of the shadows) which he considers acceptable for a given application and which he must try to reach.

- 4.3 The Respondent and the Opposition Division have argued, in substance, that the inventive idea of the patent in suit lies mainly in the teaching "to play with reflectances" in order to adjust the difference between the two quantities of light, and that D2 leads away from this idea since it does not teach to vary reflectances, but to use an additional reflector for this purpose.

In the view of the Board, the content of Claim 1, in fact, does not essentially go beyond the teaching "to play with reflectances", and this teaching is not considered inventive. D2 mentions transmission losses of the reflectors as a source of imbalance of the illumination (page 1, lines 20 to 26), which clearly suggests to a person skilled in the art "to play" with the corresponding reflectances in order to reduce the said imbalance.

The fact that D2 does not consider even a very high reflectance to be sufficient for obtaining the desired balance, but additionally provides a "flat reflector" 32 across a portion of the opening of the main reflector, does not invalidate the suggestion regarding high reflectance, but rather signifies that, based on the advantageous use of a high reflectance reflector, a further improvement is aimed at.

The effect (assumed in D2) that even with the best available subsidiary reflector full equality of the two quantities of light cannot be reached without further measures, is not due to shortcomings now eliminated by the patent in suit, but may happen with the device

according to the present patent just as well. While normally the effect of higher reflectance of the subsidiary reflector will go in the direction of better balance, the degree to which equality can be reached, depends on a great number of constructional data which are neither specified in the present patent, nor in D2. In fact, the present patent also considers it desirable to complement the features specified in Claim 1 and to increase the quantity of the light transmitted along the second light path relative to that of the first light path by using a "light shielding member" 38 (cf. Figure 1 and column 5, lines 37 to 58) which is very similar regarding its position, shape and reflecting property (aluminium foil) to the "flat reflector" 32 used according to D2. The argument of the Respondent that such a "light shielding member" is disadvantageous and is to be avoided according to the patent in suit, is not convincing since the patent specification clearly emphasizes that this embodiment is "another improvement achieved" (column 5, line 37).

Hence, the teaching of D2 does not lead away from the subject-matter of the patent in suit.

- 4.4 The Board, therefore, comes to the conclusion that the subject-matter of Claim 1, interpreted in the way necessary to avoid contradictions, lacks an inventive step in the sense of Article 56 EPC, and that Claim 1 is consequently not allowable (Article 52(1) EPC.
5. The Respondent has not directed a request to the limitation of Claim 1 by means of features from the dependent claims, and, in fact, the Board cannot see any features in Claims 2 to 5 which could render the claimed subject-matter inventive.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

P. Martorana

E. Turrini