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D E C I S I O N
of 27 October 1999

Case Number: T 0386/98 - 3.4.2

Application Number: 89401438.0

Publication Number: 0344072

IPC: G03G 15/08

Language of the proceedings: EN

Title of invention:

System for drive control of a toner agitator in an image-forming apparatus and image-forming apparatus comprising said system

Patentee:

Fujitsu Limited

Opponent:

JoensWare Kreatives Software Design

Headword:

-

Relevant legal provisions:

EPC Art. 56, 123(2) and (3)

Keyword:

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Decisions cited:

T 0528/93; T 0840/93; T 0270/90; T 0543/89; G 0009/92;
G 0004/93

Catchword:

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Boards of Appeal

Chambres de recours

Case Number: T 0386/98 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 27 October 1999

Appellant: Fujitsu Limited
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 18 February
1998 maintaining European patent No. 0 344 072 in
an amended form pursuant to Article 102(3) EPC.

Composition of the Board:

Chairman: E. Turrini
Members: A. G. Klein
B. J. Schachenmann

Summary of Facts and Submissions

- I. European patent No. 0 344 072 (application number 89 401 438.0) was maintained in an amended form by an interlocutory decision of the Opposition Division.

The opposition was founded on the ground that the subject-matter of the patent lacked an inventive step within the meaning of Article 56 EPC in view of the contents of documents:

E1: US-A-4 739 367; and

E2: JP-A-57-173 866.

An English translation of document E2 as provided by the opponent will be quoted E2' in the following.

- II. The appellant (proprietor of the patent) filed an appeal against the interlocutory decision.
- III. Oral proceedings were held on 27 October 1999, at which the appellant requested that the decision under appeal be set aside and that a patent be maintained on the basis of any of the sets of amended claims filed at the oral proceedings as his main and first to eleventh auxiliary requests.

Claim 1 of the main request reads as follows:

"1. A system for controlling a drive of an agitator (13) in an image-forming apparatus (1), such as an electro-graphic printer, in which an electro-static latent image formed on an image-carrying body (5) is

reproduced by a toner (15), the apparatus comprising a main motor (M), for driving substantially all rotating elements in the apparatus, including the agitator (13), which is built-in to a toner vessel (70) of a developer unit (8), which toner vessel (70) is removably attached to the apparatus (1);

characterized in that:

- said system comprises means operative during an initialization process for setting the rotational speed of the agitator (13) at a lower level (P) upon a start up of the main motor (M), and for raising said rotational speed to a higher level (N) corresponding to the normal operational speed after a predetermined period (T1) has passed from the start,
- a torque from said motor (M) being transmitted to said agitator."

Claim 1 of the first auxiliary request reads as follows:

"1. A system for controlling a drive of an agitator (13) in an image-forming apparatus (1), such as an electro-graphic printer, in which an electro-static latent image formed on an image-carrying body (5) is reproduced by a toner (15), the apparatus comprising a main motor (M), for driving substantially all rotating elements in the apparatus, including the agitator, which is built-in to a toner vessel (70) of a developer unit (8), which toner vessel (70) is removably attached to the apparatus (1);

characterized in that:

- said system comprises means operative during an initialization process for operating said agitator (13) at a higher-than-normal torque level by setting the

rotational speed thereof at a lower level (P) upon a start up of the main motor (M), and thereafter for operating said agitator at a normal torque level by raising said rotational speed thereof to a higher level (N) corresponding to the normal operational speed after a predetermined period (T1) has passed from the start."

Claim 1 of the second auxiliary request is distinguished from claim 1 of the first auxiliary request only by the addition, at the end of the claim, of the expression "and a torque from motor (M) being transmitted to said agitator".

Claim 1 of the third auxiliary request is distinguished from claim 1 of the first auxiliary request only by the addition, at the end of the claim, of the expression "the initialization process being started upon input of power from a source to the apparatus".

Claim 1 of the fourth auxiliary request corresponds to claim 1 of the first auxiliary request, with the above-mentioned additional features of both the second and the third auxiliary requests.

Claim 1 of the fifth auxiliary request is distinguished from claim 1 of the first auxiliary request by the addition, at the end of the claim, of the expression "the initialization process being started by detection of insertion of a fresh toner vessel into the apparatus".

Claim 1 of the sixth auxiliary request corresponds to claim 1 of the first auxiliary request, with the above-mentioned additional features of both the second and

the fifth auxiliary requests.

Claim 1 of the seventh auxiliary request reads as follows:

"1. Use of a system for controlling a drive of an agitator (13) in an image-forming apparatus (1), such as an electro-graphic printer, in which an electro-static latent image formed on an image-carrying body (5) is reproduced by a toner (15), the apparatus comprising a main motor (M), for driving substantially all rotating elements in the apparatus, including the agitator (13), which is built-in to a toner vessel (70) of a developer unit (8), which toner vessel (70) is removably attached to the apparatus (1);

characterized in that a torque from said motor (M) is transmitted to said agitator (13), and in that said use comprises the steps of, during an initialization process of said apparatus,

i) operating means operative during this initialization process, for operating said agitator (13) at a lower speed level (P) upon a start up of the main motor (M) and

ii) thereafter operating said agitator at a higher speed level (N) corresponding to the normal operational speed after a predetermined period (T1) has passed from the start,

whereby, in the initialization period, the rotation of the motor and of the agitator is not obstructed by solidified toner, and an initialization schedule is not delayed."

Claim 1 of the eighth auxiliary request reads as follows:

"1. Use of a system for controlling a drive of an agitator (13) in an image-forming apparatus (1), such as an electro-graphic printer, in which an electro-static latent image formed on an image-carrying body (5) is reproduced by a toner (15), the apparatus comprising a main motor (M), for driving substantially all rotating elements in the apparatus, including the agitator, which is built-in to a toner vessel (70) of a developer unit (8), which toner vessel (70) is removably attached to the apparatus (1);

characterized in that:

- a torque from said motor (M) is transmitted to said agitator (13), and in that said use comprises the steps of, during an initialization process of said apparatus,

i) operating means operative during this initialization process for: operating said agitator (13) at a higher-than-normal torque level by setting the rotational speed thereof at a lower speed level (P) upon a start up of the main motor (M) and

ii) thereafter operating said agitator at a normal torque level by raising said rotational speed thereof to a higher speed level (N) corresponding to the normal operational speed after a predetermined period (T1) has passed from the start,

whereby, in the initialization period, the rotation of the motor and of the agitator is not obstructed by solidified toner, and an initialization schedule is not delayed."

Claim 1 of the ninth and tenth auxiliary requests respectively correspond to claim 1 of the seventh and eighth auxiliary request, after deletion of the expression "in the initialization period, the rotation of the motor and of the agitator is not obstructed by

solidified toner, and".

Finally, the set of claims according to the eleventh auxiliary request is identical to the set of claims in the amended form as considered allowable by the Opposition Division.

The respondent (opponent) for his part requested that the appeal be dismissed.

IV. The appellant's arguments in support of his requests can be summarized as follows.

The invention concerns an electrophotographic printer or copier, in which a toner image is electrostatically formed on a photoconductive drum for transfer onto a paper surface. If the printer or copier is not used for a long period of time, or if it is used with a toner cartridge which was left for a long period of time on a shelf, the normally powdery toner might have substantially solidified around the agitator provided within the developer unit to stirr the powder. Accordingly, when the copier or printer is started, the main motor which drives the agitator may be obstructed, thus disturbing the initialization schedule at the beginning of the printing operation.

Thus, as is clearly set out in the introductory portion of the original description, the invention aims at overcoming obstruction of the motor by solidified toner. This is achieved by setting the rotational speed of the agitator, during an initialization process, first at a lower level and then to a higher level corresponding to the normal operational speed.

As a result of the setting of the rotational speed of the agitator at a lower level, a correspondingly higher torque is available for stirring the toner, for a given power or size of the driving motor.

From the statement of the technical problem in the description, it is clear that the invention as originally disclosed was not limited - in relation to the achieving of a higher torque operation of the agitator - to the use of a pulse motor, as was incorrectly assumed both by the Opposition Division and by the respondent.

Concerning the issue of inventive step, whilst document E1 actually identifies the problems associated with the solidification of the toner powder, there is no hint in the available prior art documents towards the claimed reduction of the speed of the agitator at the beginning of an initialization process. Document E2 in particular is dedicated to the quite opposite problem of the toner becoming too fluid after having lost most of its electrical charge when left unused for a prolonged time period. When the agitator and developing sleeve start to rotate at their normal speed, uncharged toner particles spread all over the housing and up to the surface of the photosensitive drum, which results in bad printing quality. This is avoided by rotating the developing sleeve and agitator at a lower speed during an entire preparatory phase.

The fundamentally different object of the present invention, which is to avoid obstruction of the motor and of the agitator by solidified toner and delaying of an initialization schedule is stated more clearly in

the newly filed use claims of the seventh to tenth auxiliary requests. These claims are not objectionable under Article 123(3) EPC, since they are directed to the use of a system comprising all the technical limitations of the system defined in claim 1 as granted, which thus already covered such use.

- V. The respondent for his part first submitted that the appellant in the opposition procedure never actually defended the version of claim 1 as granted and that he was not adversely affected by the decision in this respect. As a result, he could not in the appeal procedure present as a main request a claim corresponding in substance to claim 1 as granted, and which was broader in its scope than any of the claims defended in the opposition procedure. If his main request was allowed, he would be in a better position than if the Opposition Division had allowed his more limited main request in the opposition procedure, since he could not then have filed any valid appeal against the decision.

Concerning the patentability of the subject-matter of the main request, the respondent submitted that document E2 was dedicated to exactly the same type of electrophotographic apparatus as the patent, and that the problems of insufficiently charged or solidified toner equally applied to, and were solved in both.

He also contested that the claims were actually restricted to a system involving both low speed operation and normal speed operation of the agitator in a single initialization phase, separated from the normal printing phase.

The respondent further submitted that the subject-matter of the appellant's auxiliary requests had not been adequately disclosed in the application documents as originally filed, and he questioned the clarity of the use claims of the seventh to tenth auxiliary requests, and their admissibility under Article 123(3) EPC.

Reasons for the Decision

1. The appeal meets the requirements of Articles 106 to 108 and of Rule 64 EPC. It is admissible, accordingly.
2. *Appellant's main request*
 - 2.1 Admissibility of the request

The respondent contested that the appellant's main request was admissible, since it was directed to a version of claim 1 which, albeit substantially equivalent to the granted version, was not defended by the appellant in the opposition procedure, and was of a broader scope than the version on which his main request in the opposition procedure was based.

In the Board's view, however, there are no provisions in the Convention which as a matter of principle bar a patentee who appeals against a decision of the Opposition Division to maintain his patent in an amended form, from reverting to a version of the patent substantially equivalent to its granted version. Exceptional circumstances, like the explicit abandonment of a certain subject-matter, or the express

withdrawal of a particular request in the opposition procedure (see in this respect the decision T 528/93 referred to in the Case Law of the Boards of Appeal of the European Patent Office, third edition 1998, page 471) may indeed justify rejection of a later request directed to the same subject-matter, but no such circumstances can be recognised in the present instance.

As a matter of fact, the appellant in response to the notice of opposition immediately filed an amended claim 1, apparently in an attempt to achieve a swift settlement of the opposition. The proposed amendments however gave rise to new objections under Articles 123(2) and (3) EPC, which led to the filing of further amended versions. The Opposition Division in the appealed decision eventually rejected the then valid main, first and second auxiliary requests on the ground that the amendments brought to the different versions of claim 1 offended against the provisions of Article 123(2) EPC.

Thus, the appellant in the present appeal procedure is entitled to try to remove from the claims those amendments which were considered objectionable in the appealed decision. This cannot be construed as an unacceptable abuse of the procedure. The appellant's main request does not in particular raise issues substantially different from those raised by the requests considered by the Opposition Division (see T 084/93, OJ EPO 1996, 335).

For these reasons the appellant's main request is admitted into the procedure.

2.2 Patentability

2.2.1 The subject-matter of claim 1 is undisputedly novel.

2.2.2 The Board shares both parties' view that the nearest prior art is disclosed in document E1, which describes a system for controlling a drive of an agitator as set out in substance in the preamble of claim 1. The document does not expressly specify that the "main motor" 50 referred to in Figure 5, which drives the agitator 6b of Figure 2 (see column 5, lines 39 to 43) also drives substantially all rotating elements in the apparatus, as is required by the claim. This measure is however ascribed to the prior art in the description of the patent (see the paragraph "Description of the Related Art", in particular column 2, lines 28 to 32), which is confirmed also by the contents of document US-A-4 465 357 filed by the appellant with his statement of the grounds of appeal dated 17 June 1998 (see claim 1, lines 60 to 64). The main motor 50 in the system of document E1 clearly also transmits a torque to the agitator 6b it drives, in accordance with the last feature of the characterizing portion of present claim 1

Document E1 also explicitly points at the difficulties which arise when the toner in the developer unit comes to assume a semi-solidified state after the unit is left unused for a long time (see column 1, lines 25 to 28).

To overcome these difficulties, document E1 recommends driving the agitator in a preliminary processing step executed before actual printing (see column 1, lines 31

to 34). The document does not however comprise any indication that the rotational speed of the agitator in the preliminary phase would not correspond to its normal operational speed.

Thus, the subject-matter of claim 1 is distinguished from the system disclosed in document E1 in that it comprises means for setting the rotational speed of the agitator in an initializing process at a lower level upon a start up of the main motor and for raising said rotational speed to a higher level corresponding to the normal operational speed after a predetermined period has passed from the start.

2.2.3 The driving of the agitator at a lower speed in a start up phase of the main motor, which distinguishes the claimed subject-matter from the nearest prior art as known from document E1, does not in the Board's view necessarily result in a higher torque being available at the agitator. Such higher torque could indeed be achieved if, for instance, the motor itself was driven at a reduced speed, and if additionally it was of a type which allowed for an increased torque at a reduced speed - as is actually defined in the version of claim 1 considered allowable by the Opposition Division - or, alternatively, if for a same rotational speed of the motor, the agitator was driven via some speed reducing gearing assembly, allowing for the transmission of an increased torque at a reduced rotational speed.

No such particular devices are however defined in claim 1 and, accordingly, the only definite technical effect of the claimed reduced rotational speed of the

agitator is a corresponding decrease of the load which solidified or semi-solidified toner may oppose to the rotating agitator. This is confirmed by the introductory portion of the description of the present patent, explaining that in the conventional printer, in which the motor is rotated at substantially the same speed at the warming-up stage as during a normal printing operation, the agitator is subjected to a larger rotational load, which may cause damage to or deformation of the agitator (see column 2, lines 14 to 19). The claimed reduction of the rotational speed of the agitator in a starting phase and the corresponding decrease of the load on the agitator also allow a reduction of the power which is required from the motor to start agitating the toner, whereby a main motor having a proper capacity for driving the elements during the normal printing operation is also applicable to the abnormal beginning stage and no uneconomical larger capacity motor is required (see column 2, line 51 to column 3, line 5).

Thus, the technical problem solved by the subject-matter of present claim 1, as objectively assessed from a comparison with the nearest prior art, is to reduce the resistive load initially applied by solidified toner to the agitator and to its driving motor, when the latter is started.

- 2.2.4 The identification of the technical problem cannot per se, in the Board's view, positively contribute to inventive step. The damages to or the deformation of the agitator itself, and the delaying of the initialization schedule by obstruction of the motor, as mentioned in the description (see column 2, lines 14 to

19 and 28 to 35) are easy to identify, and so is the cause for these defects, namely the excessive resistive load applied by solidified or semi-solidified tone to the rotary agitator.

- 2.2.5 The skilled person facing the above technical problem in the Board's view would also immediately recognise that the mechanical stress initially imposed upon the agitator and motor of the device disclosed in document E1 by solidified toner could be influenced by changing the rotational speed of the agitator. Any person of an average technical awareness would expect, and it is indeed a matter of everyday experience, that the mechanical resistance afforded by thick or tacky materials against stirring increases or decreases in relation to the stirring speed.

The skilled person would therefore readily envisage to rotate the agitator at a lower speed to avoid damage to a deformation of the agitator. The more so since at the date of the invention it was already known to operate the agitator of a similar apparatus at a lower speed in a starting phase, albeit with the different purpose of avoiding the projection of yet insufficiently charged toner particles throughout the housing and up to the surface of the photosensitive drum (see document E2', page 2, lines 17 to 23).

The further feature of the characterizing part of claim 1, according to which the rotational speed of the agitator is raised to a higher level corresponding to the normal operational speed after a predetermined period, does not in the Board's opinion provide any inventive contribution either. As a matter of fact,

once the initial agitation at a low speed has resulted in a powdery toner consistency, which according to the description occurs after one rotation of the agitator only (see column 2, lines 36 to 41), the resistance generated by the toner decreases, which then allows for the normal rotational speed actually required for the proper toner mixing recommended in document E1.

It is also self-evident that if the initial rotational speed of the agitator - which is not specified in the claim - were sufficient to achieve the required mixing, its subsequent raising to the normal operational speed as is set out in the claim would not actually achieve any noticeable further technical effect or advantage. Indeed, as confirmed by the description of the present patent, the period of time of rotation at the higher speed T2 may be relatively short, and substantially no problem arises even if the rotational speed of the motor is at the lower level also in that period (see column 5, lines 7 to 14).

2.2.6 For these reasons, the subject-matter of claim 1 of the appellant's main request does not involve an inventive step within the meaning of Article 56 EPC.

2.3 The appellant's main request cannot be allowed, accordingly.

3. *Appellant's first to sixth auxiliary requests*

Claims 1 of the appellant's first to sixth auxiliary requests all refer to "operating said agitator at a higher-than-normal torque level by setting the rotational speed thereof at a lower level", and to

"operating said agitator at a normal torque level by raising the rotational speed thereof to a higher level".

The appellant in this respect submitted that the use of a pulse motor was only one example described in the original application to show how a larger torque can be generated by the agitator at a lower speed and that, taking also into account the general discussion of the problem solved by the invention, the original description made it clear that the achievement of a higher-than-normal torque was not conditional to the use of such a pulse motor.

The original description however only refers to a higher-than-normal (a "larger") torque in connection with the torque which can be generated by a **pulse motor** when rotated at a lower speed, as is illustrated by the curve of figure 7 representing the maximum torque available from such particular motor when it is rotated at different speeds. The torque of such pulse motor is inherently larger when it is rotated at a lower rotational speed, so that operating the motor at a lower speed advantageously achieves an increased torque (see the paragraph bridging pages 6 and 7 of the description as originally filed). The claims as originally filed also closely associated the use of the pulse motor with the generation of a larger torque at a lower speed, in a single dependent claim only (see claim 4).

Accordingly, the Board agrees to the Opposition Division's view that the torque/speed relationship specified in the claims was originally disclosed only

in conjunction with the provision of a pulse motor driven at a lower rotational speed in an initial phase.

The latter feature however is missing from claims 1 of the appellant's first to sixth auxiliary requests, which therefore offend against the requirements of Article 123(2) EPC.

4. *Appellant's seventh to tenth auxiliary requests*

The appellant's seventh to tenth auxiliary requests were presented only during the oral proceedings of 27 October 1999. They all include claims which for the first time are directed to the "use of a system for controlling a drive of an agitator".

The respondent in the Board's view rightly objected that the system of which the use was now claimed did not clearly comprise all the limitations of the system set out in claim 1 as granted. The present use claims in particular would appear to allow for the lower agitator speed (P) and the period (T1) of lower speed agitation being set manually by the user, rather than being an operational parameter of the system itself. The claims would therefore at least in this respect appear to offend against the requirement of Article 123(3) EPC.

In the absence of any substantial further limitation, it is not clear either how these claims may overcome the objections under Articles 56 and 123(2) EPC raised above against the claims of the main and first to sixth auxiliary requests.

Since for the above reasons the appellant's seventh to tenth auxiliary requests do not appear to be immediately allowable, they cannot be admitted into the procedure at this late stage (see T 270/90 and T 543/89, Case Law of the Boards of Appeal, 3rd edition, 1998, page 505).

5. *Appellant's eleventh auxiliary request*

The patent documents in accordance with the appellant's eleventh auxiliary request are identical to those of the amended version considered allowable by the Opposition Division in the appealed decision.

Since the patentee was the sole to appeal against the decision, neither the Board of Appeal nor the non-appealing opponent could challenge maintenance of the patent as thus amended (see the ruling of the Enlarged Board of Appeal in decisions G 9/92 and G 4/93; both in OJ EPO, 1994, 875).

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

P. Martorana

E. Turrini