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D E C I S I O N
of 12 July 2000

Case Number: T 0318/97 - 3.2.2

Application Number: 89850079.8

Publication Number: 0332599

IPC: D21F 5/04

Language of the proceedings: EN

Title of invention:

Method and device in the draw of the web in the area of single-wire draw in the drying section of a paper machine and a cylinder used in the draw of the web

Applicant:

VALMET CORPORATION

Opponent:

1. BELOIT CORPORATION
2. Voith Sulzer Papiermaschinen GmbH

Headword:

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Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (no)"
"Relevant prior art document in a broader general field"

Decisions cited:

T 0176/84, T 0195/84, T 0032/81

Catchword:

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Case Number: T 0318/97 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 12 July 2000

Appellant: BELOIT CORPORATION
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 24 February 1997
rejecting the oppositions against European patent
No. 0 332 599 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: W. D. Weiß

Members: M. G. Noël
J. C. M. De Preter

Summary of Facts and Submissions

- I. In consequence of two oppositions filed against the grant of European patent No. 0 332 599, the Opposition Division decided by interlocutory decision dated 24 February 1997 to reject the oppositions and to maintain the patent as granted.
- II. The state of the art was represented, in particular, by the following documents:
- D1: GB-A-2 125 461, and
- D8: US-A-3 630 424, or its parent document
- D9: DE-A-2 129 950.
- III. An appeal was lodged in the prescribed time limit by both opponents, but opponent 1 decided on 12 February 1998 to withdraw both opposition and appeal. Opponent 2 (thereafter named the appellant) filed a statement of grounds of appeal on 30 June 1997.
- The respondent (proprietor of the patent) replied by letter dated 4 February 1998 and filed new sets of claims according to three auxiliary requests I to III along with corresponding adaptations of the description, in addition to the previous main request (version of the claims as granted).
- Still further arguments were filed by the parties on 15 October 1998 and on 29 March 1999, respectively.
- IV. In a communication dated 13 March 2000 send following a summons to oral proceedings, the Board of Appeal

requested the parties to focus the discussion principally on the inventive step of the main claims according to all requests, in particular with respect to the prior art documents D1 and D8. Having regard to the new features incorporated in the auxiliary requests, it was the intention of the Board to also consider document

D17: FR-A-2 099 138, another document parent to D8 and D9 but disclosing further embodiments.

V. Oral proceedings were held on 12 July 2000, during which the parties argued as follows:

(i) The appellant:

- with respect to the disclosure in document D1 which is the closest prior art, the characterising features of claim 1 solve the problem of avoiding the wearing of the sealing ribs arranged inside the suction rolls. This technical problem is independent of the use of the suction rolls. Therefore, document D8 which refers to suction rolls generally, must be considered.

- Document D8 discloses a suitable vacuum roll functioning in the same way as in the present patent by appropriate distribution of holes passing through the roll mantle and grooves provided at the outer surface of the roll, a low but sufficient negative pressure is produced inside the roll so as to hold the conveying web in contact with the surface of the roll, in spite of holes being uncovered by the web.

Therefore, the subject-matter of claim 1 is obvious with respect to the combination of documents D1 and D8.

- The range of values introduced in the claims according to the auxiliary requests are the result of optimization and routine considerations close at hand for a person skilled in the art. Therefore, these values add nothing inventive, having regard to document D8 which also discloses general formula applicable in all circumstances.

(ii) The respondent:

- The suction rolls described in the closest prior art document D1 suffer from the drawbacks reported in the contested patent. The subject-matter of claim 1 is distinguished therefrom by its characterising features.
- The skilled person to be considered is not only an expert in the field of papermaking machines but also a technician having general knowledge in engineering. However, he would not have considered document D8 which relates to non-ported vacuum drums usable in the photographic industry, that is a far remote technical field having nothing in common with the handling of web paper in a multi-cylinder dryer paper machine.

Even if the skilled person were to combine the teachings of documents D8 and D1, he would not have arrived at the subject-matter of claim 1

(main request) because document D8 discloses a system of crossed grooves at the outer surface of the roll and there is no mention that A_1 should be substantially larger than A_0 (in the sense of the patent in suit).

- As to the auxiliary requests document D8 does not disclose similar numerical ranges either. Since the fields of application are different, the numerical values disclosed in document D8 (or parent documents D9, D17) would not suit the specific requirements of papermachine suction rolls, such as avoiding fluttering of the two-layers (web and wire) at the entering nip of the rolls or sticking at the exit, as well as avoiding clogging of the holes due to paper fibres.

In the present patent, the ranges of values as claimed are necessary for obtaining a correct functioning of the suction rolls, according to which a relatively little force is capable of keeping the paper web on the wire face. The patent does not give the details of how the ranges as claimed are obtained, but such considerations lie within the normal competence of a person skilled in the art.

VII. At the end of the oral proceedings, the requests of the parties were as follows:

The appellant requested that the decision under appeal be set aside and that the European patent be revoked.

The respondent requested that the appeal be dismissed

and that the patent be maintained as granted or that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of one of the three auxiliary requests submitted on 4 February 1998, with the provision that in claim 3 of the third auxiliary request the term "annular" be inserted between the words "into" and "grooves".

VIII. Independent claims according to the various requests read as follows:

- (i) main request: independent claims 1 and 3 as granted.

"1. Method in the drying group or groups provided with single-wire draw in a multi-cylinder dryer of a paper machine for supporting the web (W), said multi-cylinder dryer comprising drying cylinders (K) heated by means of steam or equivalent, the web (W) being pressed by a drying wire (H) against the cylinder face of said drying cylinders, and said multi-cylinder dryer comprising leading or lower cylinders or rolls (10), on which the web (W) runs outside the drying wire (H), and in which method a negative pressure (P_1) is applied to the inner mantle face (11b) of the leading cylinders (10), which are provided with holes (15) passing through the mantle (11) of the leading cylinders (10) and open into the interior space (14) of negative pressure in the cylinder (10), whereby the negative pressure (P_1) in the interior space (14) of the cylinder (10) is transmitted to the outer face of the

cylinder mantle (11), so that an adhesion force (F) is applied to the web (W), **characterized** in that the negative pressure (P_1) is applied to the entire inner mantle face (11b), so that free flow of air is permitted into the leading cylinder (10) also from that area (S) of the cylinder which is not covered by the wire (H) and the web (W), that the outer face of the cylinder mantle (11) is provided with grooves (13) into which the holes (15) end and that the total cross-sectional flow area (A_1), perpendicular to the radial direction of the cylinder (10), of the grooves (13) is substantially larger than the total cross-sectional flow area (A_0) of the holes (15)."

"3. Device in the drying group or groups of a paper machine, the device comprising a multicylinder dryer provided with single-wire draw for securing the run of the web (W), said multicylinder dryer comprising drying cylinders (K) heated by means of steam or equivalent, the web (W) being adapted to be pressed by a drying wire (H) against the cylinder face of said drying cylinders (K), and which multicylinder dryer comprises leading or lower cylinders or rolls (10), on which the web (W) is adapted to remain outside the drying wire (H), and which device comprises a source (20) of negative pressure, from which negative pressure is applied through a suction duct (19) to an interior space (14) of negative pressure in the leading cylinders (10), whereby the negative pressure (P_1) is applied to the inner mantle

face (11b) of the leading cylinders (10), which is provided with holes (15) passing through the cylinder mantle (11) and open, at one end thereof, into the interior space (14) of negative pressure in the leading cylinders (10), **characterized** in that the arrangement is such that the negative pressure (P_1) is applied at the same time to the entire inner mantle face (11b) of the leading cylinders (10), so that free flow of air (L_1) is permitted through the holes (15) in the mantle (11) of the leading cylinders (10) into the interior space (14) in the leading cylinders (10) also from that area (S) of the leading cylinders (10) in which the wire (H) and the web (W) are not pressed against the outer face of the leading cylinders (10), that the other end of the holes (15) open into grooves (13) provided in the outer surface of the mantle (11) of the leading cylinders (10), and that the total cross-sectional flow area (A_1), perpendicular to the radial direction of the leading cylinders (10), of the grooves (13) is substantially greater than the total cross-sectional flow area (A_0) of the holes (15)."

- (ii) Auxiliary request I: independent claims 1 and 3 differ from the main request by the following characterizing portions:

"1. **characterized** in that the negative pressure (P_1) is applied to the entire inner mantle face (11b), that free flow of air is permitted into the leading cylinder (10) from that area (S) of the cylinder which is not covered by the wire (H) and the web (W), that

the outer face of the cylinder mantle (11) is provided with annular grooves (13) into which the holes (15) end and that the ratio of the total cross-sectional flow area (A_0) of the holes (15) in the leading cylinder (10) to the total cross-sectional flow area (A_1), perpendicular to the radial direction of the leading cylinder (10), of the grooves (13) perforated with the holes (15) is within the range of 1:10 to 1:150."

"3. **characterized** in that the arrangement is such that the negative pressure (P_1) is applied at the same time to the entire inner mantle face (11b) of the leading cylinders (10), that free flow of air (L_1) is permitted through the holes (15) in the mantle (11) of the leading cylinders (10) into the interior space (14) in the leading cylinders (10) from that area (S) of the leading cylinders (10) in which the wire (H) and the web (W) are not pressed against the outer face of the leading cylinders (10), that the other end of the holes (15) open into annular grooves (13) provided in the outer surface of the mantle (11) of the leading cylinders (10), and that the ratio of the total cross-sectional flow area (A_0) of the holes (15) in the leading cylinders (10) to the total cross-sectional flow area (A_1), perpendicular to the radial direction of the leading cylinders (10), of the grooves (13) perforated with the holes (15) is within the range of 1:10 to 1:150."

- (iii) Auxiliary request II: independent claims 1 and 3 differ from the main request by the following

characterizing portions:

"1. **characterized** in that the negative pressure (P_1) is applied to the entire inner mantle face (11b), that free flow of air is permitted into the leading cylinder (10) from that area (S) of the cylinder which is not covered by the wire (H) and the web (W), that the outer face of the cylinder mantle (11) is provided with annular grooves (13) into which the holes (15) end, that the total cross-sectional flow area (A_1), perpendicular to the radial direction of the cylinder (10), of the grooves (13) is substantially larger than the total cross-sectional flow area (A_0) of the holes (15) and in that the total cross-sectional flow area (A_0) of the holes (15) is selected such that the level of the negative pressure (P_1) within the interior space (14) of the cylinder (10) is within the range of 1000 Pa to 3000 Pa while the flow (Q) per metre of width of the cylinder through the holes (15) into the interior space (14) in the cylinder (10) is within the range of 500 m³/mh to 1500 m³/mh."

"3. **characterized** in that the arrangement is such that the negative pressure (P_1) is applied at the same time to the entire inner mantle face (11b) of the leading cylinders (10), that free flow of air (L_1) is permitted through the holes (15) in the mantle (11) of the leading cylinders (10) into the interior space (14) in the leading cylinders (10) from that area (S) of the leading cylinders (10) in which the wire (H) and the web (W) are not pressed against the outer face of

the leading cylinders (10), that the other end of the holes (15) open into annular grooves (13) provided in the outer surface of the mantle (11) of the leading cylinders (10), that the total cross-sectional flow area (A_1), perpendicular to the radial direction of the leading cylinders (10), of the grooves (13) is substantially greater than the total cross-sectional flow area (A_0) of the holes (15) and in that the total cross-sectional flow area (A_0) of the holes (15) is selected such that the level of the negative pressure (P_1) within the interior space (14) of the cylinders (10) is within the range of 1000 Pa to 3000 Pa while the flow (Q) per metre of width of the cylinders through the holes (15) into the interior space (14) in the cylinders (10) is within the range of 500 m³/mh to 1500 m³/mh."

- (iv) Auxiliary request III: independent claims 1 and 3 differ from the main request by the following characterizing portions:

"1. **characterized** in that the negative pressure (P_1) is applied to the entire inner mantle face (11b), that free flow of air is permitted into the leading cylinder (10) from that area (S) of the cylinder which is not covered by the wire (H) and the web (W), that the outer face of the cylinder mantle (11) is provided with annular grooves (13) into which the holes (15) end, that the ratio of the total cross-sectional flow area (A_0) of the holes (15) in the leading cylinder (10) to the total cross-sectional flow area (A_1), perpendicular to the

radial direction of the cylinder (10), of the grooves (13) perforated with the holes is within the range of 1:10 to 1:150, and in that the total cross-sectional flow area (A_0) of the holes (15) is selected such that the level of the negative pressure (P_1) within the interior space (14) of the cylinder (10) is within the range of 1000 Pa to 3000 Pa while the flow (Q) per metre of width of the cylinder through the holes (15) into the interior space (14) in the cylinder (10) is within the range of 500 m³/mh to 1500 m³/mh."

"3. **characterized** in that the arrangement is such that the negative pressure (P_1) is applied at the same time to the entire inner mantle face (11b) of the leading cylinders (10), that free flow of air (L_1) is permitted through the holes (15) in the mantle (11) of the leading cylinders (10) into the interior space (14) in the leading cylinders (10) from that area (S) of the leading cylinders (10) in which the wire (H) and the web (W) are not pressed against the outer face of the leading cylinders (10), that the other end of the holes (15) open into annular grooves (13) provided in the outer surface of the mantle (11) of the leading cylinders (10), that the ratio of the total cross-sectional flow area (A_0) of the holes (15) in the leading cylinders (10) to the total cross-sectional flow area (A_1), perpendicular to the radial direction of the leading cylinders (10), of the grooves (13) perforated with the holes is within the range of 1:10 to 1:150, and in that the total cross-sectional flow area A_0 of the holes (15) is

selected such that the level of the negative pressure (P_1) within the interior space (14) of the cylinders (10) is within the range of 1000 Pa to 3000 Pa while the flow (Q) per metre of width of the cylinders through the holes (15) into the interior space (14) in the cylinders (10) is within the range of 500 m³/mh to 1500 m³/mh."

Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*

With respect to the version as granted, the amendments brought to the method and device claims according to the auxiliary requests result in adding features drawn up from the description (negative pressure (P_1) within the range of 1000-3000Pa; air flow (Q) through the holes within the range 500-1500 m³/mh; auxiliary requests II and III) or in replacing one feature (area A_1 larger than area A_0) by a more specific one (ratio A_0/A_1 within the range 1/10 - 1/150; auxiliary requests I and III) or in replacing one feature (ratio A_0/A_1 within the range 1/10-1/150; auxiliary requests I and III), all supported by the description.

Therefore, the amendments are not open to objections on the grounds of Articles 84 and 123(2) and (3) EPC.

3. *Closest prior art*

Claim 1 (method) and claim 3 (device) being narrowly

linked in scope by similar features, the Board will restrict its investigations to independent method claim 1, having in mind that everything which is said in relation to claim 1 will apply to claim 3 by analogy.

Document D1 represents the state of the art coming closest to the invention. As mentioned in the contested patent (cf. column 2) document D1 discloses a dryer section of a papermaking machine having all the features contained in the preamble of either claim 1 or claim 3. In particular, it discloses a multicylinder dryer comprising a plurality of heated drying cylinders 3 to 12, a paper web W being pressed by a drying wire or felt F against the outer face of the drying cylinder, and a plurality of leading rolls 14 to 22, on which the web runs outside the drying wire. A negative pressure is applied to the inner mantle face of the leading cylinders (cf. Figure 2) which are provided with holes 25a passing through the mantle 25 and into the interior space of the cylinder, whereby the negative pressure is transmitted to the outer face of the cylinder mantle, so that an adhesive force is applied to the web.

Figure 3 shows as an alternative embodiment a leading roll provided with annular grooves on its outer surface, however without holes passing through the cylinder mantle. According to the specification of document D1 (cf. page 2, lines 39 to 55 and Figure 2), when vacuum cylinders are used as leading cylinders, they are provided with an internal suction box formed by a stationary inner pipe 24 perforated (arrows 24a) on one-half of its periphery and surrounded by an outer rotating cylinder 25 with diametrically opposed sealing ribs 24b, 24c extending between the inner pipe and the concentric cylinder. Therefore, negative pressure produced by inward flow of air through the perforations 24a is applied only to the upper half of the inner mantle face of the leading cylinder and no free flow of air is permitted into the cylinder from that area of the cylinder which is not covered by both the wire and the web.

It results therefrom that the subject-matter of claim 1 differs from the disclosure of document D1 by the features defined in the characterizing portion of the claim.

4. *Inventive step (main request)*

4.1 The distinguishing features mentioned above represent the solution of the problem recited in the contested patent of avoiding the drawbacks associated with the wear of the sealing ribs arranged in the suction cylinders (cf. D1, column 1, lines 17 to 22).

As explained in the contested patent (column 2, lines 28 to 50), the invention resides essentially in that instead of forming a suction box inside the

cylinders, holes are drilled into the bottom of circumferential grooves machined in the roll mantle. A limited number of holes are appropriately dimensioned and distributed so that a negative pressure can be produced and maintained in spite of a part of the holes being open to the open air, in that part of the roll not covered by the web. As the negative pressure is spread by the grooves on the outer surface of the roll, a relatively little force is capable of keeping the paper web on the wire face and, hence, onto the roll, since the suction is applied to the web through the wire.

- 4.2 Document D8 (or parent documents D9, D17) discloses drilled, non-ported vacuum drums for conveying web material in general. As an example, such vacuum drums are said to be used in the photographic industry, but the general concept and functioning of the vacuum drums will not be changed if they are used in other industries or applied to convey other web materials than photographic films.

More particularly, document D8 discloses a vacuum drum, the outer surface of which is provided with a number of small holes and a system of closely spaced grooves 12 and slots 13 for connecting the holes and, therefore, spreading the vacuum over the drum surface for holding the web. The highest web holding ability is obtained when the web completely covers the groove system, but the vacuum drum is able to hold the web to its surface even with most of the holes uncovered. Either axial or circumferential grooves may be used, but circumferential grooves are preferred.

The basic idea is to provide the drum with a little

number of small holes (diameter preferably under 1,5 mm) in order to increase the air flow resistance offered by the holes (cf. column 3, lines 53 to 58) such that even if more holes in the drum are open to the atmosphere, this has a very small effect on the drum internal vacuum (column 5, lines 3 to 7). In other words the attractive force remains practically unchanged whether the holes are covered by the web or not (column 3, lines 40 to 42). The same solution and concept are used in the patent in suit with the same technical effect. In this respect, the Board observes that increasing the air flow resistance offered by the holes, as in document D8, is equivalent to restricting the air flow Q through the holes into the interior space of the cylinder, as in the contested patent (column 5, lines 29 to 34).

This technical effect is used in document D8 to avoid conventional ported vacuum drums in which porting or rotary valving systems are necessary for disconnecting the vacuum supplied from that portion of the drum not covered by the web. In the present patent, this technical effect is used to avoid the additional suction box of document D1, provided with wearable sealing ribs inside the cylinder. However, whatever the state of the art taken as starting point may be, in both cases the same solution makes it possible to eliminate additional elements by providing an identical new concept and a similar design for the vacuum rolls.

Document D8 does not state explicitly that the total cross-sectional flow area A_1 of the grooves should be larger than the total cross-sectional flow area A_0 of the holes. But, having regard to the dimensional characteristics of the holes and the grooves reported

in document D8 and the distance to be observed between two consecutive holes, it appears self evident that the condition $A_1 > A_0$ will be satisfied in any case since the same result necessarily implies the same relationship.

It results therefrom that document D8 discloses all the characterizing features recited in claim 1.

- 4.3 The remaining point to be considered is whether the skilled person would apply the teaching of document D8 to the leading rolls disclosed in document D1 so as to arrive at the subject-matter of claim 1.

As acknowledged by the respondent at the oral proceedings, the person skilled in the art is not only to be sought in the specific field of papermaking machines but is expected to have also common general knowledge in engineering, i.e. in design, building and use of engines and machinery in general (cf. Concise Oxford Dictionary). Therefore, in an attempt to find a solution to its technical problem of improving suction rolls, the skilled person will not restrict its investigations to papermaking machines (D21F, according to the International Classification attributed to both the contested patent and the document D1) but will also consult other or more general fields where similar problems arise such as the handling of thin or filamentary material, e.g. sheets, webs, cables (B65H, according to the International classification attributed to document D8).

In this respect, it is to be considered that in volume 9 of the International Classification (Fourth Edition, 1984) which was expected to be used at the priority date of the present patent, it is stated on

page 132 (note 3) of the english version that "in this subclass (B65H),

- "handling" includes (a.o) feeding, guiding, orientating, winding and
- "thin material" includes (ii) webs, tapes and films, e.g. of paper, fabric, metal foil or plastics."

These notes must be regarded as a clear link between the subclasses D21F and B65H, and consequently between documents D1 and D8, respectively.

Moreover, according to the well established jurisprudence of the Boards of Appeal, the skilled person and the relevant prior art to be considered when assessing inventive step are to be found as well in neighboring fields as in broader general fields, of which the specific field is part, that is to say any field in which the same problem or one similar to it arises. (T 32/81, OJ EPO 1982, 225; T 176/84, OJ EPO 1986, 50 and T 195/84, OJ EPO 1986, 121). Consequently, again, document D8 has to be considered.

The statement in document D8 that the small holes should not be more than 1,5 mm in diameter since, otherwise, porting is requested, is not dissuasive. On the one hand, having regard to the various embodiments disclosed in document D8 or in parent documents D9, D17, the diameter of the holes may be up to 2,5 mm (D17, page 10, lines 10 to 13 and claim 2; D9, page 20 and claim 2). On the other hand, the dimensioning of the holes is related to a number of parameters such as the total number n of the holes, the air flow rate Q through the drum mantle, the vacuum V inside the drum with all holes uncovered, in accordance with the

general formula given e.g. in document D8 (column 4, lines 10 to 17) or in document D17 (page 10 and claim 2). Therefore, the statement above cannot be regarded as a general limitation imposed on the diameter of the holes and is only worth in the frame of document D8 with respect to the specific background reported in this document, not with respect to that reported in the contested patent.

4.4 From the foregoing it results that, since document D8 addresses the same general problem as in the contested patent and discloses a solution which is suitable both in both its principle and embodiment, the subject-matter of claim 1 is suggested by the combination of the teachings of documents D1 and D8. Therefore, the provisions of Article 56 are not met.

5. *Auxiliary requests*

5.1. The auxiliary requests incorporate numerical ranges of values which warrant a satisfactory operation of the suction cylinders according to the invention. Thus, in claim 1 according to the first auxiliary request, there is specified that the ratio A_0/A_1 must be within the range of 1/10 to 1/150, in the second auxiliary request the required negative pressure P_1 must be within the range of 1000 Pa to 3000 Pa and the flow rate Q within the range of 500 m³/mh to 1500 m³/mh. The third auxiliary request is merely a combination of the three previous characteristics.

5.2 In the Board's judgement, the specific values incorporated in the auxiliary requests are regarded as falling within the normal competence of a person skilled in the art, having in view the contemplated

technical application, and are only the consequence of self-evident dimensioning and optimization considerations since the general concept and design of the invention were already known from document D8. As a matter of fact, this document discloses general formula applicable to any concrete situation, including the construction of suction cylinders for papermaking machines. Therefore, the skilled person is able to calculate for each parameter, suitable values in relation to the considered application. In particular, it is clear that the values selected for A_0/A_1 , P_1 and Q will necessarily take account of the facts that, in a single-wire arrangement of a multi-cylinder dryer paper machine, the web is to be supported by the wire with sufficient and substantially invariable negative pressure, so that open draws between the drying cylinders and the leading cylinders, and thereby web flutter, are avoided, and that an adhesion force is to be applied to the web for preventing it to be separated from the wire even at high operating speeds. All these prerequisites were already implicitly contained in document D1, which refers to the same application.

Therefore, although document D8 (or parent documents D9, D17) does not explicitly mention the values as claimed, by way of the general formula and the various numerical embodiments exemplified in all these parent documents, the skilled person is presented with all necessary information to arrive without under burden, at the ranges as claimed. Besides, the respondent's statement at the oral proceedings that the numerical ranges as claimed are not further detailed nor explained in the patent specification because they are easily determinable by a person skilled in the art, demonstrates for the trivial nature of these numerical

ranges.

- 5.3 Consequently, the features incorporated into the claims according to the auxiliary requests fail to add anything inventive to the subject-matter of the claims according to the main request. Therefore, the claims according to the auxiliary requests are not acceptable either.

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:

V. Commare

W. D. Weiß