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**Datasheet for the decision
of 13 December 2023**

Case Number: T 1827/21 - 3.2.05

Application Number: 12185299.0

Publication Number: 2537676

IPC: B41F13/00, B41K3/12, B41K3/10,
B41F33/00

Language of the proceedings: EN

Title of invention:

Numbering device for typographic numbering having independent driving means

Patent Proprietor:

KBA-NotaSys SA

Opponent:

Paul Leibinger GmbH & Co. KG Nummerier-
und Markierungssysteme

Relevant legal provisions:

EPC Art. 76(1), 56
RPBA 2020 Art. 12(3), 12(5), 12(6)

Keyword:

Amendments - extension beyond the content of the earlier application as filed (auxiliary requests 7, 8: yes)
Inventive step - (auxiliary request 9: no)
Late-filed auxiliary requests - admitted (auxiliary request 10: no)

Decisions cited:

G 0002/10, T 0345/90, T 0701/91



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Case Number: T 1827/21 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 13 December 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
13 August 2021 concerning maintenance of the
European Patent No. 2537676 in amended form.**

Composition of the Board:

Chairman P. Lanz
Members: T. Vermeulen
F. Blumer

Summary of Facts and Submissions

- I. The opponent lodged an appeal against the interlocutory decision of the opposition division finding that European patent No. 2 537 676 ("the patent") as amended according to auxiliary request 7 met the requirements of the European Patent Convention.
- II. The patent originates from European patent application No. 12 185 299.0, a second-generation divisional application of European patent application No. 07 789 741.1 filed as international application PCT/IB2007/052366 and published as WO 2007/148288 A2 ("the earlier application").
- III. The opposition was filed against the patent as a whole on the basis of the grounds for opposition under Article 100(a) together with Article 54(1) EPC (lack of novelty) and Article 56 EPC (lack of inventive step), under Article 100(b) EPC and under Article 100(c) EPC.
- IV. By decision of 3 November 2017, the opposition division revoked the patent in suit for the reason that the ground for opposition under Article 100(c) EPC prejudiced the maintenance of the patent as granted. In particular, it was held that claim 1 as granted included subject-matter which extended beyond the content of divisional application 12 185 299.0 as filed. That decision was the subject of an earlier appeal. In its decision T 123/18 of 17 December 2019, the board in a different composition set aside the opposition division's decision and remitted the case to the opposition division for further prosecution on the basis of the claims submitted as auxiliary request IIIb

on appeal, which was then renumbered by the opposition division to auxiliary request 5. It was at the oral proceedings held before the opposition division on 23 June 2021 that the claims of auxiliary request 7 underlying the present appeal were filed.

V. The following documents were referred to during appeal proceedings:

- D1 EP 1 389 524 A1
- D2 JP H06-68849 U
- D3 JP 2004160788 A
- D6 EP 0 286 317 A1
- D15 C. Richter, "Elektrische Stellantriebe kleiner Leistung", Berlin, VDE-Verlag, 1988, pages 5, 6 and 94-100
- D17 "maxon - Programm 06/07", maxon motor, April 2006, pages 26-31, 39-41, 150 and 201
- D18 "maxon 04/05", maxon motor GmbH, April 2004, pages 189, 150, 26-28, 34-35, 39-41
- D19 "Antriebssysteme", Faulhaber group, 2005, pages 4-5, 20-21, 74-75, 78-79, 97, 176 and 184
- D62 GB 1 554 152.

VI. The oral proceedings before the board took place on 13 December 2023.

VII. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed, i.e. that the patent be maintained on the basis of auxiliary request 7, or that the decision under appeal be set aside and the patent be

maintained as amended on the basis of the claims of one of auxiliary requests 8, 9 and 10 filed in reply to the statement of grounds of appeal.

VIII. Claims 1 and 2 of auxiliary request 7 considered allowable by the opposition division have the following wording (the feature numbering used in the decision under appeal appears in square brackets).

"1. [F1] A numbering device (1) for carrying out numbering in sheet-fed or web-fed numbering presses, said numbering device (1) comprising [F2] a casing and [F3] a numbering unit (6) with rotatable numbering wheels (7) carrying alpha-numerical symbols thereon, [F4] which numbering wheels (7) are disposed next to each other and rotate about a common rotation axis, [F5] said numbering device further comprising electro-mechanical actuation means for setting the position of said numbering wheels (7), [F6] wherein said electro-mechanical actuation means are disposed in an inner space of the casing of said numbering device (1) and [F7] are mechanically autonomous, [F7.1] wherein the casing comprises two side frame parts (3, 3') having bearings for the common shaft about which the numbering wheels rotate and [F7.2] the electro-mechanical actuation means being located between these side frame parts of the casing, [F8] said electro-mechanical actuation means comprising a plurality of independent driving means (15, 18-23; 23*) for actuating a corresponding plurality of said numbering wheels (7), [F9] wherein each independent driving means comprises an electric motor (15) driving the associated numbering wheel through a gear-wheel assembly (16, 19-23; 23*), [F10] which gear-wheel assembly (16, 19-23; 23*) [F10'] forms a two-stage gearing [F10"] and exhibits a reduction factor (R_z), [F10.1] the electric motor (15)

being coupled to the gear-wheel assembly via a reduction gear, [F11] wherein the electric motor (15) is a brush-less DC motor with electronic commutation, [F12] wherein each independent driving means exhibits an overall reduction factor (R) between an output of the electric motor (15) and the associated numbering wheel (7), [F12.1] this overall reduction factor (R) between an output of the electric motor (15) and the corresponding numbering wheel (7) being selected to be such that a positional resolution of the numbering wheel, measured at its periphery, is of the order of 0.1 to 0.15 mm or less, [F13] wherein the numbering device comprises more than six rotatable numbering wheels (7) actuated by a corresponding number of independent driving means (15, 18-23; 23*), and [F14] wherein either all of the numbering wheels (7) are actuated by independent driving means (15, 18-23; 23*) or [F15] a part of the numbering wheels (7) are actuated by independent driving means (15, 18-23; 23*) and a remaining part of the numbering wheels (7) are manually-actuated numbering wheels."

"2. The numbering device according to claim 1, further comprising calibration sensors (13), preferably Hall-effect detectors, for calibrating the position of the numbering wheels (7) actuated by the electro-mechanical actuation means about the rotation axis, each calibration sensor (13) cooperating with at least one magnet (12) carried by the numbering wheel (7) to be calibrated, and wherein the calibration sensors (13) are carried by one or two supporting members (14, 14') located in an upper part of the numbering device, which one or two supporting members (14, 14') extends or extend parallel to the rotation axis of the numbering wheels (7) and is or are mounted between the side frame parts (3, 3'; 303; 303*)."

IX. The claims of auxiliary request 8 correspond to claims 1 to 17 of auxiliary request 7 with the following additional feature in claim 1.

"[F16] and wherein die [sic] numbering device further comprises a releasable indexing mechanism (7a, 50; 7a', 50'; 7a', 510, 520) for mechanically aligning and maintaining the position of the numbering wheels during a numbering operation"

X. Claims 1 to 6 of auxiliary request 9 correspond to claims 1, 9, 14, 15, 16 and 18 of auxiliary request 7. The remaining claims 2 to 8, 10 to 13 and 17 of auxiliary request 7 were deleted in auxiliary request 9.

XI. Apart from the following additional feature in claim 1, the claims of auxiliary request 10 correspond to claims 1 to 5 of auxiliary request 9.

"[F16'] and wherein the numbering device further comprises a releasable indexing mechanism (7a, 50; 7a', 50'; 7a', 510, 520) for mechanically aligning and maintaining the position of the numbering wheels during a numbering operation"

XII. The appellant's submissions may be summarised as follows.

Auxiliary request 7

In the earlier application as filed, the features of dependent claims 2 to 7 of auxiliary request 7 were only disclosed as a combination. The relevant passage was page 12, lines 10 to 23 of the earlier application

as filed. Isolating some of the features of this passage in the form of separate dependent claims was not allowable under Article 76(1) EPC. It followed from the aforementioned passage and the figures of the earlier application as filed that the supporting members of the calibration sensors were in a structural and functional relationship with further features that were either left out of the claims of auxiliary request 7 or formulated as further dependent claims. For example, the cited passage mentioned the aspect that the supporting members could be rotated backwards. It was immediately clear from the figures of the earlier application as filed that such a rotation was necessary to allow the assembly and disassembly of the numbering unit. However, this aspect was only claimed in claim 3 of auxiliary request 7. There was no basis in the earlier application as filed for the numbering device of claim 2 having supporting members that did not have to be rotatably mounted. The same applied to claim 6 of auxiliary request 7 when dependent on claims 1 or 2 but not on claim 3. The requirements of Article 76(1) EPC were thus not fulfilled.

Auxiliary request 8

The objections raised under Article 76(1) EPC against the claims of auxiliary request 7 persisted in auxiliary request 8. For the same reasons as set out before, auxiliary request 8 was thus not allowable.

Auxiliary request 9 (claim 1 corresponding to claim 1 of auxiliary request 7)

Document D1 was the closest prior art. In agreement with the opposition division, features F10', F10.1, F11, F12.1 and F13 were not disclosed by document D1.

The first three distinguishing features specified the selection of the motor and the details of the drive train. Their technical effect was that the motors were small in size, had a long service life, a high speed and a high torque. Feature F12.1 required a certain positioning accuracy and thus implicitly defined an overall reduction factor for a known numbering wheel diameter. The minimum number of wheels of feature F13 did not entail any surprising technical effect; it was an arbitrary choice from a myriad of possibilities. In general, the flexibility of the numbering scheme increased with the number of numbering wheels actuated by independent driving means.

The technical effects of the distinguishing features were juxtaposed; there was no combinative effect that went beyond the sum of the individual effects. The number of numbering wheels driven by electro-mechanical actuation means did not have any influence on the size of the motors, their service life, speed or torque. Conversely, these motor variables did not influence the degree of flexibility that could be achieved with a given number of motors. Accordingly, for each group of distinguishing features it was to be examined separately whether or not it involved an inventive step.

The distinguishing features were all directed to aspects a skilled person would have dealt with when processing a customer order for a given numbering device. It followed from the desired numbering scheme how many motorised numbering wheels had to be foreseen, which resolution had to be achieved and what dynamic requirements were placed on the drive. In this respect, each of the distinguishing features was the result of a

selection process made in the course of normal practice of the skilled person. This included the design of the drive train, which followed from textbooks such as document D15.

Since document D1 only contained general information on the motors used to actuate the numbering wheels, the skilled person would have consulted catalogues from renowned motor manufacturers, such as documents D17 to D19. These catalogues described brushless DC motors with electronic commutation as high-precision drives particularly suited for positioning tasks, see for example the cover page and pages 26 and 27 of document D17. Especially emphasised in document D17 were the performance and long service life of the motors, which made them suitable for use in numbering devices. It followed from page 150 of document D17 that the dimensions of the brushless DC motors were small. The same could be said about the multi-stage planetary gearbox shown on page 201 of document D17. Claim 1 did not require a separation between the two-stage gearing and the reduction gear. Consequently, document D17 disclosed a brushless DC motor with electronic commutation, a miniature two-stage planetary gearbox and a further reduction stage in accordance with features F10', F10.1 and F11. It would have been obvious to implement these features in the numbering device of document D1.

The positioning accuracy of feature F12.1 could not establish an inventive step either. In fact, the skilled person would have first analysed which accuracy was required and then designed the drive train accordingly. The dimensions of the pinions and gears of the gearbox, which should lead to the desired

positioning accuracy, were not mentioned in the patent and were thus left entirely to the skilled person.

Regarding feature F13, paragraph [0055] of document D1 already mentioned the flexibility and complete independence of numbering wheels driven by motors. The expression "at least the wheels" in that paragraph hinted at the actuation of more than two numbering wheels by means of dedicated, independent motors. Depending on the desired numbering sequence, the skilled person only had to adapt the number of motors. Suggestions for using more motors could also be found in documents D62 and D6. The respondent's considerations concerning limited space and arrangement of the motors were not reflected by the wording of claim 1. Nonetheless, Figures 5 and 8 of document D1 already suggested how multiple motors would be arranged in a compact manner.

In conclusion, the subject-matter of claim 1 of auxiliary request 9 did not involve an inventive step.

Auxiliary request 10

Auxiliary request 10 should have been filed already in the proceedings before the opposition division in reaction to the appellant's inventive step objection raised in these proceedings against auxiliary request 7. Its late filing had affected the submissions made in the statement of grounds of appeal. Further evidence would have been filed with the grounds of appeal if auxiliary request 10 had already been in the proceedings. The fact that the additional feature of claim 1 of auxiliary request 10 was taken from one of the dependent claims of the patent as granted did not discharge the respondent from arguing at the beginning

of the appeal why the objections already raised in opposition proceedings against that dependent claim had been wrong. Auxiliary request 10 must therefore not be admitted into the appeal proceedings.

XIII. The respondent's submissions may be summarised as follows.

Auxiliary request 7

The group of additional features of dependent claim 2 of auxiliary request 7 had basis in the passages on page 12, lines 10 to 13 and on page 12, lines 22 to 23, as well as in Figures 2 and 4 of the earlier application as filed. The features concerned the arrangement of the calibration sensors when fulfilling their task while being accessible for assembly and disassembly purposes without having to remove the numbering unit. The additional feature of claim 3 of auxiliary request 7 was disclosed on page 12, lines 19 to 23 of the earlier application as filed. The additional features of claims 6 and 7 of auxiliary request 7 were based on the first paragraph of page 12 of the earlier application as filed. Hence, the requirements of Article 76(1) EPC were fulfilled.

Auxiliary request 8

The feature relating to an "indexing mechanism" was taken from claim 20 of the patent as granted. The dependencies of the claims were adapted. Auxiliary request 8 was allowable for the same reasons as set out with regard to auxiliary request 7.

Auxiliary request 9 (claim 1 corresponding to claim 1 of auxiliary request 7)

Document D1 concerned a numbering device with eight numbering wheels. The wheels corresponding to the positions of the hundreds and thousands digits were actuated independently by drive motors. Figure 5 of document D1 schematically illustrated motors and a single-stage intermediate gear for driving the numbering wheels. Specifics of the motors were not discussed in document D1. Paragraph [0057] of document D1 emphasised that the mechanical actuating mechanism of the ones and tens digits was more reliable and faster. As a consequence, at least features F10', F10.1, F11, F12.1 and F13 were not disclosed by document D1.

The distinguishing features constituted a combination of features interacting with each other; they were not merely juxtaposed. The objective technical problem was to significantly increase the flexibility of the numbering device without loss of accuracy.

The claimed solution was not obvious for the following reasons. The numbering device of document D1 was used to number notes arranged in lines and columns. Figure 3a, for example, showed successive numbers printed on a note arranged in five columns and nine lines. For each column at least a numbering device had to be provided. The space available for the numbering devices was therefore limited. From Figure 8 of document D1 it was also clear that there was not much space inside the numbering device. With such boundary conditions, it was in practice not possible to use a numbering device with more than six independently driven numbering wheels. In

addition, there was no incentive for the skilled person to change the arrangement of document D1 and add further gear stages.

When arguing obviousness of the claimed subject-matter, the appellant only referred to documents D17 to D19, each of which was actually a selection of a limited number of pages from an extensive catalogue. Prior art specifically related to the claimed subject-matter was not cited. Starting from document D1, it was not apparent why the skilled person would have turned to extensive catalogues instead of seeking for solutions in the prior art of numbering machines. Document D2, for example, related to numbering devices similar to the one of document D1, whereby all six numbering wheels were independently driven by stepping motors. Also the twelve wheels of the numbering device of document D3 were individually driven by stepping motors. Such solutions thus clearly differed from the solution of feature F11. But even when ignoring these prior art disclosures and combining document D1 with any of documents D17 to D19, this would not have led to the claimed subject-matter. Firstly, it could be assumed that the pages of the catalogues that were not included in documents D17 to D19 disclosed several further drive configurations. Secondly, none of the documents D17 to D19 showed a two-stage gearing in addition to a reduction gear as required by feature F10'. In this respect, it had to be taken into account that a gearbox with multiple stages did not necessarily result in a gear reduction. Instead, the input and output of the gearbox were decisive. The claimed feature combination was thus not obviously derivable from any of documents D17 to D19.

Therefore, the subject-matter of claim 1 of auxiliary request 9 involved an inventive step.

Auxiliary request 10 - admittance

Similarly to auxiliary request 8, the claims of auxiliary request 10 were filed as a precautionary measure in reaction to the appellant's inventive step objection in the statement of grounds of appeal against the subject-matter claimed in auxiliary request 7. They were based on those of auxiliary request 9, but had an additional feature related to an indexing mechanism. The additional feature was taken from claim 20 of the patent as granted. The subject-matter of claim 1 of auxiliary request 10 involved an inventive step in view of the cited prior art because the additional feature further contributed to the solution of the aforementioned problem, namely by preventing inaccuracies caused by a slight twist of an independently driven numbering wheel during mechanical contact with the substrate while printing. In the oral proceedings before the board, the respondent added that auxiliary request 10 could not have come as a surprise to the appellant. Since auxiliary request 7 was found allowable by the opposition division, there had been no reason for the respondent to file auxiliary request 10 already during the proceedings before the opposition division. The substantiation of this request was self-explanatory. Auxiliary request 10 must therefore be admitted into the appeal proceedings.

Reasons for the Decision

1. Auxiliary request 7 - added subject-matter under Article 76(1) EPC
 - 1.1 Claim 1 of auxiliary request 7 defines a numbering device for carrying out numbering in sheet-fed or web-fed numbering presses. It has seventeen dependent claims, some of them without counterpart in the claims of the earlier application as filed. Dependent claim 2 is such a claim. It was introduced with the filing of the divisional application 12 185 299.0 which led to the patent in suit and was further amended in the proceedings before the opposition division resulting in the decision under appeal.
 - 1.2 Dependent claim 2 of auxiliary request 7 concerns the arrangement of calibration sensors in the numbering device. The sensors are required to be "carried by one or two supporting members (14, 14') " arranged in a particular manner inside the numbering device. Although "calibration means" are mentioned in claims 20 and 21 of the earlier application as filed, there is no basis in the claims of the earlier application as filed for the "supporting members". In fact, the arrangement of the supporting members inside the numbering device is only disclosed in a specific context in the earlier application as filed, namely on page 12, lines 10 to 23. In reference to the example of Figure 2, this passage points out that

"[s]upporting members 14, 14' are mounted between the side frame parts 3, 3' and can be rotated backwards from their illustrated positions away from the numbering unit 6 once the top cover member

4 is removed, thereby enabling assembling or disassembling of the numbering unit 6".

- 1.3 The first aspect of the passage requiring the supporting members to be mounted between the side frame parts is claimed by dependent claim 2 of auxiliary request 7. In contrast, the second aspect of the passage is only claimed in dependent claim 3 of auxiliary request 7. Hence, claim 2 of auxiliary request 7 leaves open whether the supporting members are rotatable or fixed and whether or not the numbering device has a top cover member.
- 1.4 Thus, it needs to be established whether the separation of these aspects in two different claims lies within the limits of what a skilled person would derive directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing, from the whole of the earlier application as filed (G 2/10, OJ EPO 2012, 376, Reasons 4.3).
- 1.5 In the board's view, nothing in the earlier application as filed indicates that the supporting members can be mounted in a fixed manner or that the top cover member is an optional component. On the contrary, the strict requirements to the supporting members disclosed in the above-cited passage are confirmed by the figures of the earlier application as filed. In Figure 1, the numbering device is depicted with a top cover member 4 and side cover members 8. Through an opening 4a of the top cover member part of the numbering wheels emerge. After having omitted the top cover member and the side cover members in Figure 2, supporting members 14 and 14' become visible. It is immediately evident from this figure that each supporting member is mounted between a

left side frame part 3 and a right side frame part 3'. The drawings of Figures 4 and 6 show in more detail how this is done. The supporting member has lateral support arms, each with a cylindrical hole and a U-shaped groove extending parallel to the rotation axis of the device. A first pin is inserted both in the cylindrical hole of a lateral support arm and in a corresponding hole of a side frame parts 3, 3'. A second pin projects from the side frame part and is inserted from below in the groove of the lateral support arm so that it abuts against the top surface of the groove. It is reasonable to conclude from this construction that each supporting member 14, 14' is adapted to rotate about the axis of the first pins, but is held in the illustrated position close to the numbering unit by virtue of its abutment with the second pins. The relative position of the supporting members in the numbering device shown in Figure 2 also implies that a rotation away from the numbering unit is only possible once top cover member 4 has been removed.

1.6 It follows from the above considerations that the second aspect of the above-cited passage of the earlier application as filed is closely linked to the first aspect in the context of the arrangement of the supporting members. The numbering device of claim 2 of auxiliary request 7, with the first aspect but without the second aspect, can thus not be derived directly and without ambiguity, using common general knowledge, and seen objectively and relative to the date of filing, from the earlier application as filed.

1.7 Hence, the subject-matter of claim 2 of auxiliary request 7 extends beyond the content of the earlier application as filed, contrary to the requirements of

Article 76(1) EPC. Auxiliary request 7 is thus not allowable.

2. Auxiliary request 8 - added subject-matter under Article 76(1) EPC

Compared to auxiliary request 7, claim 1 of auxiliary request 8 has an additional feature concerning a releasable indexing mechanism. The dependent claims, however, have not been amended. For the same reasons as set out with regard to auxiliary request 7, auxiliary request 8 is thus not allowable under Article 76(1) EPC.

3. Auxiliary request 9 - inventive step under Article 56 EPC

(a) Starting point and distinguishing features

- 3.1 The parties are in agreement with the opposition division that document D1 can be taken to represent the closest prior art for the inventive step assessment. It is also common ground between the parties that the subject-matter of claim 1 of auxiliary request 9, which is identical in wording to claim 1 of auxiliary request 7, differs from the numbering device known from document D1 by the features F10', F10.1, F11, F12.1 and F13. The board agrees. The numbering device of document D1 has eight (Figure 5) or nine (Figures 6 to 8) numbering wheels, only two of which are driven by unspecified electric motors; the other wheels are either actuated mechanically or electromagnetically (see paragraphs [0059] to [0064] of document D1). In addition, the disclosure of paragraph [0061] and

Figures 5 and 8 of document D1 is not sufficient to conclude that the gear-wheel assembly transmitting the torque from the motors to the numbering wheels has two gear stages or that a reduction gear is coupled between the motor and the gear-wheel assembly.

(b) Technical effects and objective technical problem

3.2 In point II.C.2.2.2 of the decision under appeal, the opposition division defined the objective technical problem as to provide a quicker and more precise commutation of independently driven numbering wheels in a numbering device. The respondent presented a different formulation: to significantly increase the flexibility of the numbering device without loss of accuracy. In contrast, the appellant's position is that the distinguishing features can be divided in three separate groups which merely represent an aggregation, namely features F10', F10.1 and F11 form the first group, feature F12.1 forms the second group and feature F13 the third group. These groups of features did not mutually influence each other to achieve a combined technical effect other than the sum of their respective individual effects.

3.3 In the board's view, the appellant convincingly argued that feature F13 has to be considered separately from the other distinguishing features. Setting the minimum number of numbering wheels and independent driving means to seven (or more) does not influence the way in which the individual numbering wheels are driven or vice versa. Since the description of the patent in suit does not contain any further guidance, the only technical effect achieved by feature F13 would be that more numbering wheels can be set to their desired position independently from the other numbering wheels.

The operation of the numbering device thus becomes more flexible.

- 3.4 Feature F12.1 requires the overall reduction factor between an output of the electric motor and the associated numbering wheel to be such that a certain positional resolution of the numbering wheel is achieved. The resolution is given in mm and measured at the periphery of the wheel. However, the diameter of the wheel is not specified. Feature F12.1 does therefore not necessarily result in "a sufficiently fine adjustment of the position of the numbering wheels" as suggested in paragraph [0050] of the patent in suit. Still, this does not mean that no synergistic effect exists between feature F12.1, on the one hand, and features F10', F10.1, F11, on the other hand. It stands to reason that the selection of the overall reduction factor and any possible effect this may have on the adjustment of the position of the numbering wheels is causally linked to the driving mechanism of the numbering wheel, which in the case in hand is determined by the type of motor and the way in which the torque is transmitted from the motor to the numbering wheel. Feature F11 confines the electric motor of feature F9 to "a brush-less DC motor with electronic commutation". And features F10' and F10.1 require that the electric motor is coupled to a two-stage gearing via a reduction gear which, according to paragraph [0047] of the patent in suit, provides for an additional reduction of the output speed and an additional increase of the output torque of the motor. It is thus only in combination that features F10', F10.1, F11 and F12.1 achieve the technical effect of providing an appropriate drive for the numbering wheels in function of the requirements of the numbering device.

3.5 As a consequence, the distinguishing features can be divided into two groups, namely a first group formed by features F10', F10.1, F11 and F12.1, and a second group formed by feature F13. Each group solves a different objective technical problem: how to find an appropriate driving system for the numbering wheels of a numbering device, and how to make the operation of the numbering device more flexible, respectively. According to the partial problems approach ("Case Law of the Boards of Appeal of the European Patent Office", 10th edition 2022, I.D.9.3.2), each group of features must be considered individually. The subject-matter of the claim is then considered to involve an inventive step if the solution to at least one of the partial problems is not obvious (see, for example, T 345/90, Reasons 5 and T 701/91, Reasons 6.4 and 6.5).

(c) Obviousness - first partial problem

3.6 The appellant referred to documents D17, D18 and D19 in support of its argument that a brushless DC motor with electronic commutation would be particularly suitable for positioning a numbering wheel of the device known from document D1. The respondent disputed this approach and referred instead to documents D2 and D3.

3.7 Documents D2 and D3 are patent documents which, according to paragraph [0018] of the patent in suit, both deal with numbering devices using stepping motors for driving the numbering wheels. This does, however, not mean that the search for a solution to the first partial problem would stop at this point. It is reasonable to assume that the skilled person, in an attempt to find an appropriate driving system for the numbering wheels of a numbering device, would have been

prompted to further explore the technical field of high-precision drive systems available to the public at the priority date of the patent in suit. Consulting customer catalogues of companies that manufacture such drive systems is certainly a promising avenue for acquiring such information. In fact, it would have been rather encouraging to the skilled person that the cover page of document D17 mentions "[Programm 06/07] of the leading global supplier of high-precision drives and systems" ("*des weltweit führenden Anbieters von hochpräzisen Antrieben und Systemen*"). Even if document D17 is merely a collection of excerpts from a voluminous catalogue containing plenty of information on alternative drive solutions, this does not mean that the teaching of the individual passages selected from the catalogue must be ignored. This is all the more true since the selected excerpts contain links to one another in a way which provides an overall consistent picture. Page 150 of document D17, for example, gives a concrete example of a maxon EC motor ("*EC 6, ø6 mm, bürstenlos, 1.2 Watt*") of the kind discussed on a more general level on pages 26 and 27 of document D17. Furthermore, under the heading "*maxon-Baukastensystem*" on page 150 an explicit reference to page 201 is included. This last excerpt of document D17 provides an example of a maxon gear ("*Planetengetriebe GP6 ø6 mm, 0.002 - 0.03 Nm*"), the general characteristics of which are presented on pages 28 and 29 of document D17. The respondent has thus not convinced the board that the skilled person would have been dissuaded from consulting document D17 in order to solve the first partial problem.

- 3.8 It is clear from page 26 of document D17 that maxon EC motors are brushless DC motors with electronic commutation suitable for start-stop operation and

positioning tasks ("*Mögliche Anwendungen [...] Start-Stop-Betrieb [...] Positionieraufgaben*"). In addition, page 28 of document D17 teaches that a maxon gear is a precision gear unit which exerts power with high torque and reduced speed ("*Wenn die Leistung bei stark erhöhtem Drehmoment und entsprechend reduzierter Drehzahl erbracht werden soll, empfiehlt sich ein maxon Präzisionsgetriebe*"). The multi-stage planetary gear unit shown on the upper right side of page 28 coupled to the output shaft of the maxon EC motor has an outer diameter as small as 6 mm and a reduction factor ranging from 4 : 1 to 6285 : 1 ("*Untersetzungen von 4 : 1 bis 6285 : 1 [...] Aussen Ø 6 - 81 mm*"). In order to achieve such a large reduction, the planetary gear unit must have several speed reducing gear stages (the explosive view at the bottom of page 28 of document D17 shows at least three gear stages). Concrete examples of a maxon EC motor and a matching maxon planetary gear unit with an outer diameter of 6 mm are provided on pages 150 and 201 of document D17. It is evident from the first table on page 201 that a planetary gear unit used in combination with the motor of page 150 ("*in Kombination mit EC 6*") can have three gear stages to reduce the motor speed by a factor of 57 : 1. A maximum of five gear stages is even foreseen in order to achieve a reduction factor of 854 : 1. In view of these disclosures, the skilled person would have had good reason to conclude that the solutions discussed on pages 150 and 201 of document D17 are appropriate for driving the wheels of the numbering device of document D1. It would thus have been obvious to use the combined maxon "EC6" motor and the corresponding planetary gear unit instead of the unspecified motors 15 and 16 shown in Figures 5 and 8 of document D1.

3.9 The respondent argued that document D17 fails to show a gear-wheel assembly forming a two-stage gearing in addition to a reduction gear, as required by features F10' and F10.1. In the board's view, the wording of claim 1 of auxiliary request 9 does not place any constraints on the type or the arrangement of the reduction gear and the two-stage gearing. At least the first couple of gear stages of the planetary gear units disclosed on page 201 of document D17 can therefore be regarded as forming a reduction gear in the sense of feature F10.1. The last gear stage of the planetary gear unit combined with the spur gear stage of document D1 (i.e. the combination of the motor pinion with drive pinion 17 or 18 and the toothed wheel of numbering wheel 3 or 4), would then form the two-stage gearing defined in feature F10'. In this context, the board wishes to point out that the depiction of motors 15 and 16 in Figure 8 of document D1 suggests that there already is a reduction gear associated with each motor. Likewise, the relative arrangement of the drive pinions 17 and 18 in Figure 8 indicates that there might be two or more (not illustrated) gear stages between the output shafts of the motors and the numbering wheels.

3.10 By combining the numbering device of document D1 with the teaching of document D17, the skilled person would thus have arrived at a numbering device including not only features F1 to F10, F10", F12 , F14 and F15, but also features F10', F10.1, F11 and F12.1.

(d) Obviousness - second partial problem

3.11 The appellant convincingly argued that, in practice, the constructional and operational aspects of a numbering device depend to a large extent on the numbering scheme desired by the customer. The total

number of numbering (or: typographic) wheels of the device, for example, immediately follows from the number of digits of the numbering sequence that is to be printed on the security document. Accordingly, the seven-digit serial number printed in Figures 3a to 3e of document D1 requires seven typographic wheels, whereas the eight-digit number of Figures 4a to 4c is printed by eight typographic wheels. When attempting to solve the second partial problem of making the operation of the numbering device more flexible, it is therefore implicit that the skilled person would have started by selecting the number of typographic wheels in accordance with the desired numbering scheme. If the customer specified a numbering sequence with nine or ten digits, this obviously means that a numbering device with a nine or ten typographic wheels would be foreseen (see also paragraph [0021] of document D1: "[o]f course, more digits may be used").

3.12 It is mentioned in point 3.1 above that only two of the numbering wheels of the numbering device shown in Figures 5 and 6 to 8 of document D1 are driven by motors, namely the numbering wheels responsible for printing the hundreds and the thousands digits. They are depicted in the schematic drawing of Figure 5 by reference signs 3 and 4. But paragraph [0055] of document D1 contains the following statement:

"at least the wheels for the hundreds digit and thousands digit are actuated in a totally independent manner, for example by dedicated motors, to allow the skip of numbers" (emphasis added).

This implies that the inventors of document D1 did not see any technical hurdle or prejudice that would have

prevented the actuation of at least some, if not all, of the other higher digits numbering wheels by an independent motor and corresponding gear-wheel assembly. Of course, it is true that limited space is available inside the numbering device of document D1. Nevertheless, much of that space is taken up by the components of the mechanical or electromagnetic actuating system. Switching to a motorised actuation would mean omitting these components and, hence, freeing up space that can be used otherwise. It must also be taken into account that the perspective drawing of Figure 8, which better reflects the actual construction of the numbering device compared to the schematic drawing of Figure 5, illustrates a rather compact arrangement of motors 15, 16 which extend in parallel to the common shaft of the numbering wheels. It stands to reason that the skilled person would have arranged any additional motors in the same compact manner inside the numbering device.

3.13 In sum, it would have been obvious for the skilled person to solve the second partial problem by selecting the number of typographic wheels of the numbering device known from document D1 in function of the numbering sequence specified by the customer and to drive the digits (other than the ones and the tens) by means of independent motors, in line with what is claimed by feature F13.

3.14 The respondent submitted that the little space available between numbering devices operating on adjacent columns of the sheet illustrated in Figure 3a of document D1 would have dissuaded the skilled person from installing further motors inside the numbering device and actuating more than six numbering wheels independently. This argument is not persuasive. The

respondent has not convincingly shown that the size of the numbering device known from document D1 would increase when installing additional motors. In fact, for the reasons given in point 3.12 above, the board is not persuaded that arranging five further motors in the device shown in Figure 8 of document D1 would have forced the skilled person to enlarge the casing of the numbering device in such a way that it had interfered with the numbering device operating on an adjacent column.

(e) Conclusion

3.15 Having solved both partial problems, the skilled person would have arrived at a numbering device having all features of claim 1 of auxiliary request 9 in an obvious manner. Hence, the subject-matter of claim 1 of auxiliary request 9 does not involve an inventive step (Article 56 EPC). Auxiliary request 9 is thus not allowable.

4. Auxiliary request 10 - admittance

4.1 It was undisputed between the parties that the claims of auxiliary request 10 were filed for the first time on appeal, namely in reply to the statement of grounds of appeal. Indeed, they do not correspond to any of the claim requests 5 to 7 on which the decision under appeal is based nor to any of the other claim requests filed during the proceedings preceding the decision.

4.2 In section 2.3 of the reply to the statement of grounds of appeal, the respondent submitted that the auxiliary request 10 was based on auxiliary request 9 wherein, as in auxiliary request 8, a feature had been added to

claim 1 that was taken from dependent claim 20 of the patent as granted. Because of the reference to auxiliary request 8, the board understands the reason given in section 2.1 of the respondent's reply for the late-filing of auxiliary request 8 to apply equally for auxiliary request 10. Hence, the respondent filed the claims of auxiliary request 10 as a precautionary measure in reaction to the appellant's inventive step objection in the statement of grounds of appeal against the subject-matter claimed in auxiliary request 7.

- 4.3 It follows from point 5.5 of the minutes of the oral proceedings held before the opposition division on 23 June 2021, however, that the appellant had already raised a detailed inventive step objection against the subject-matter of claim 1 of auxiliary request 7 at the oral proceedings. Starting from the numbering device of document D1, the appellant argued that the skilled person would have arrived at the distinguishing features in an obvious manner in view of documents D17, D18 or D19 in combination with the common general knowledge. The same combination had already been presented at the outset of the opposition proceedings in the context of an inventive step objection against the claim 1 as granted (see section III.1.d.v of the notice of opposition). Also the inventive step objection against the subject-matter claimed in auxiliary request IIIb (later renumbered to auxiliary request 5) underlying the board's decision in previous appeal proceedings T 123/18 was based on that combination (see sections II.2 to II.7 of the appellant's letter dated 22 April 2021). It follows that the objection which the respondent intended to address in its reply to the statement of grounds of appeal by filing the claims of auxiliary request 10 was

not filed by the appellant for the first time on appeal but was already known to the respondent during the proceedings before the opposition division.

- 4.4 The board adds that claim 1 of auxiliary request 7 only differed from claim 1 of auxiliary request 5 by the addition of feature F10', i.e. limiting the gear-wheel assembly to a two-stage gearing. Since the appellant's inventive step objection against auxiliary request 5 raised in its letter dated 22 April 2021 had specifically relied on a reference to the (multi-stage) planetary gear unit disclosed on page 201 of document D17, the respondent could have expected well ahead of the oral proceedings held before the opposition division on 23 June 2021 that the appellant would maintain its inventive step objection also against the independent claim of an auxiliary request which corresponded to claim 1 of auxiliary request 5 supplemented with feature F10'.
- 4.5 In view of these considerations, the board holds that the circumstances were such that it was not justified to file the claims of auxiliary request 10 only at the appeal stage. These claims could and should have been filed already during the proceedings before the opposition division. Pursuant to Article 12(6), second sentence, RPBA 2020, the board did not admit the claims of auxiliary request 10 into the appeal proceedings.
- 4.6 Notwithstanding the above reasons in view of Article 12(6) RPBA 2020, the board additionally notes the following regarding the substantiation of auxiliary request 10. In section 3.3 of its reply, the respondent indicated that the subject-matter of claim 1 of auxiliary request 10 was based on inventive step in view of the prior art under consideration because the

additional feature F16' of claim 1 prevented inaccuracies caused by a slight twist of an independently driven numbering wheel during mechanical contact with the substrate while printing. No further details were given, in particular not in reference to document D1. The respondent thus left the board and the appellant in the dark whether or not it considered feature F16' to be a further distinguishing feature with regard to the device of document D1 and, if yes, whether or not it held that there was a synergistic effect with the other distinguishing features. Furthermore, the respondent did not explain if and why it was of the view that the indexing mechanism of feature F16' was not disclosed by any of documents D17 to D19 or part of the common general knowledge, nor was argument presented regarding the common general knowledge. Contrary to the respondent's assertion, this was not self-explanatory. Instead, it was left to the board and the appellant to deduce the reasons why feature F16' would overcome the appellant's objection of lack of inventive step against claim 1 of auxiliary request 7. As a consequence, the reply to the statement of grounds of appeal did not set out clearly and concisely the reasons why it was requested that the decision under appeal be amended, contrary to the requirements of Article 12(3) RPBA 2020. Auxiliary request 10 could thus not be admitted under Article 12(5) RPBA 2020 since the requirements of Article 12(3) RPBA 2020 were not met.

5. Conclusion

There being no other requests by the respondent, it follows that the patent must be revoked.

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:



N. Schneider

P. Lanz

Decision electronically authenticated