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D E C I S I O N
of 23 April 2002

Case Number: T 0427/97 - 3.4.1

Application Number: 88112572.8

Publication Number: 0302458

IPC: G07D 9/00

Language of the proceedings: EN

Title of invention:
Paper sheet processing apparatus

Patentee:
KABUSHIKI KAISHA TOSHIBA

Opponent:
GIESECKE & DEVRIENT GmbH

Headword:

-

Relevant legal provisions:
EPC Art. 52(1), 56

Keyword:
"Inventive step (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0427/97 - 3.4.1

D E C I S I O N
of the Technical Board of Appeal 3.4.1
of 23 April 2002

Appellant: KABUSHIKI KAISHA TOSHIBA
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 24 February 1997
revoking European patent No. 0 302 458 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: G. Davies
Members: R. Q. Bekkering
H. K. Wolfrum

Summary of Facts and Submissions

I. The appellant (patentee) lodged an appeal against the decision of the opposition division, dispatched on 24 February 1997, revoking the European patent No. 0 302 458. The notice of appeal was received on 15 April 1997, the appeal fee being paid on the same day, and the statement of grounds of appeal was received on 24 June 1997.

II. Opposition had been filed against the patent as a whole, based on Article 100(a) EPC on the grounds of lack of inventive step (Articles 52(1), 56 EPC).

The opposition division held that claim 1 as amended in the opposition proceedings did not involve an inventive step and revoked the patent accordingly.

III. In the appeal proceedings reference was made to the following documents:

D2: US-A-4 586 232

D2': DE-A1 33 37 463

D3: DE-C2 27 60 269

IV. Oral proceedings were held on 23 April 2002.

V. The appellant requested that the decision under appeal be set aside and the patent be maintained in amended form on the basis of:

Main request:

Claims 1, 5 and 9 filed on 24 June 1997, with claims 2 to 4, 6 to 8 and 10 as granted;
Columns 1 to 27 of the description as granted;
Figures according to pages 22 to 54 of the patent specification.

First auxiliary request:

Claims 1 to 10 filed on 25 March 2002;
Description and Figures as for the main request.

Second auxiliary request:

Claims 1 to 10 filed on 25 March 2002;
Description and Figures as for the main request.

Furthermore, the patentee's representative indicated he would be prepared to introduce the feature concerning a "stocking box" in all requests, if considered necessary to fulfil the requirements of Article 123(2) EPC.

VI. The respondent requested that the appeal be dismissed.

VII. Claim 1 of the **main request** reads as follows:

"1. A sheet processing apparatus, adapted to process a first number of paper sheets being bound by at least one strap to form a sheaf and a second number of sheaves being bound by at least one band to form a bundle, said apparatus including at least one inspecting device (14) and controller means (20), electrically connected to said inspecting device

(14), for receiving from said inspecting device (14) a number of effective sheets counted by said inspecting device,

wherein said inspecting device (14) includes:

an inspection unit (176) for inspecting a predetermined number of sheets to discriminate effective sheets and unidentifiable sheets;

a sorting/stocking unit (178) for sorting the sheets into effective and unidentifiable sheets based on the inspection;

a counter (254) for counting the number of the effective sheets; and

removable cassette means (196) associated with the inspecting device (14) for collecting the unidentifiable sheets;

said apparatus further including an unidentifiable sheet processor means (22), electrically connected to said controller means (20) and to said inspecting device (14), adapted to receive the cassette means (196) from said inspecting device (14), for determining the number of unidentifiable sheets in the cassette means (196) regardless of the processing speed of the inspecting device (14), for fetching the counted number of effective sheets from said controller means (20), and for determining whether the sum of the number of unidentifiable sheets and the number of effective sheets is coincident with said predetermined number;

characterized in that

said apparatus comprises a plurality of inspecting devices (14) and said controller means (20) is electrically connected to each inspecting device (14), for receiving from each inspecting device

(14) a number of effective sheets counted by each inspecting device (14);
said unidentifiable sheet processor means (22) is electrically connected to each of said inspecting devices (14) and is adapted to receive the cassette means (196) from each inspecting device (14) and to determine the number of unidentifiable sheets in the cassette means (196) regardless of the processing speed of each of the inspecting devices (14);
a bundle processor (12) is connected to said inspecting devices (14) through respective pre-processors (16) and a conveyor (18) for conveying bundles (T), said pre-processors (16) fetching bundles (T) from said conveyor (18), said bundle processor (12) includes a first counting means (28a) for detecting the number of sheaves of a bundle (T), means for transferring a bundle (T) to said conveyor (18) when the number of sheaves of that bundle detected by the counting means (28a) coincides with a predetermined number and means (30) for rejecting that bundle when the number of sheaves of that bundle detected by the counting means (28a) does not coincide with the predetermined number; and
rejecting means is provided at one end of the conveyor (18) and serves as a storing box for storing a bundle (T) which the pre-processors (16) fail to fetch."

Claim 1 of the **first auxiliary request** corresponds to claim 1 of the main request, with the addition of the feature "wherein machine number data on each inspecting device (14) and cassette number data on the cassette

means are transmitted to the controller means(20) and the controller means (20) prepares log data".

Furthermore, the features according to which the unidentifiable sheet processor means is electrically connected to "*said controller means (20)*" and is adapted to determine the number of the unidentifiable sheets in the cassette means "*regardless of the processing speed of the inspecting device (14), for fetching the counted number of effective sheets from said controller means (20), and for determining whether the sum of the number of unidentifiable sheets and the number of effective sheets is coincident with said predetermined number*" have been transferred from the preamble to the characterising portion of the claim.

Claim 1 of the **second auxiliary request** corresponds to claim 1 of the main request, with the addition of the feature "*wherein said first counting means (28a) counts the detected boundaries of straps in the respective bundle, thereby detecting the number of sheaves*".

Furthermore, the same features as in the first auxiliary request have been transferred from the preamble to the characterising portion of the claim.

Claims 2 to 10 of all requests are dependent on claim 1.

VIII. The appellant argued essentially as follows:

Concerning the admissibility of the amendments (Article 123(2) EPC):

The contested omission in claim 1 (all requests) of the

stocking box as part of the means for rejecting bundles having an incorrect number of sheaves was admissible, since this feature was clearly inessential and superfluous to the skilled reader. Furthermore, claims 1 according to the first and second auxiliary requests contained additional features disclosed in the description as originally filed.

Concerning inventive step:

The apparatus of claim 1 according to the main request differed from the closest prior art given by document D2' by the features defined in the characterising part of the claim. Having regard to this prior art, the claimed apparatus yielded an increase in efficiency by providing, in particular, plural inspection devices, a conveyor and a bundle processor. This allowed for a transition from a serial processing of bundles as disclosed in document D2' to a parallel processing of bundles. Although the skilled person, having the qualifications of both a mechanical and a data-processing engineer, could have considered automating the bundle separation into sheaves in the apparatus of document D2', as well as a duplication of the entire apparatus of document D2', this would not have led him to the claimed apparatus. The claimed apparatus allowed for a particularly efficient way of processing bundles in parallel, whereby a bundle is unbound and the sheaves are evenly distributed over the plurality of parallel inspecting devices. In particular, the significance of counting the number of sheaves in each bundle at the bundle processor and rejecting the deficient bundles had to be considered in the light of such an even distribution.

Accordingly, an inventive step had to be recognised for the subject-matter of claim 1 according to the main request.

The apparatus of claim 1 according to the first auxiliary request additionally allowed for a correlation of the inspection results with the inspecting device which performed the inspection and with the corresponding cassette means, not suggested by the cited prior art. Both machine and cassette number data were specifically pertinent for the preparation of log data.

Finally, the apparatus of claim 1 according to the second auxiliary request additionally defined specific means for counting the number of sheaves in a bundle, not suggested by the cited prior art.

Hence, *a fortiori*, an inventive step had to be recognised for the subject-matter of claim 1 according to the first and second auxiliary requests.

IX. The respondent's arguments may be summarised as follows:

Concerning the admissibility of the amendments (Article 123(2) EPC):

Claim 1 as amended covered a variety of ways of dealing with the deficient bundles after counting, whereas the originally filed application documents only disclosed transferring the deficient bundles to a rejectable bundle stocking box (cf. column 5, lines 20 to 23 of the contested patent). Thus the amendment introduced subject-matter extending beyond the content of the

application as originally filed. Furthermore, claims 1 according to the first and second auxiliary requests contained additional features taken out of the proper context in which they were originally disclosed.

Concerning inventive step:

Document D2', providing the closest prior art, disclosed an apparatus not only comprising all features of the preamble of claim 1 according to the main request, but also suggested the provision of a plurality of inspection devices in parallel, connected to a common control and re-inspection unit (cf. page 10, lines 32 to 35; page 11, line 28 to page 12, line 1; and page 41, lines 23 to 25). Furthermore, the idea of parallel processing for increasing the throughput using a plurality of apparatuses was generally known and the provision of a common control and re-inspection unit was obvious in view of the high costs of these units.

Finally, the processing of bundles did not produce any unexpected effect. The contested patent relied on the importance of checking the bundle at an early stage. However, if this were to be important, for example for providing feed-back to the bank that wrapped the bundle, it would have been obvious to provide such an early check including counting the number of sheaves in a bundle.

The additional feature of claim 1 according to the first auxiliary request was rendered obvious by document D2', where machine number data was transmitted to the control unit.

Finally, the additional feature of claim 1 according to the second auxiliary request consisted of a straightforward selection of a *per se* well known and clearly suitable counting means.

Reasons for the Decision

1. The appeal is admissible.
2. *Admissibility of the requests under Article 123(2) and (3) EPC*
- 2.1 Claim 1 according to the main request:

Regarding the omission of the stocking box in the rejecting means, the respondent has argued that the application documents as originally filed only disclosed transferring the deficient bundles to a rejectable bundle stocking box.

The application documents as originally filed indeed disclose, in the context of the description of a detailed embodiment, that the bundle passes through the counting means, so that a bundle consisting of more than or less than 10 sheaves is transferred to a stocking box (cf. column 6, lines 23 to 29; column 6, line 48 to column 7, line 4; Figures 7 and 8). However, in the detailed description of the operation of the apparatus, the rejection of the deficient bundles is disclosed in more general terms, without the mention of a stocking box (cf. column 19, lines 38 to 45; Figure 17). Furthermore, the application as originally filed does not explicitly state that this feature is essential to the invention, nor would this be implicit

to the skilled reader. On the contrary, to the skilled reader of the application as originally filed it would be readily apparent that transferring the bundle to a stocking box after rejection is merely a preferred realisation, other alternative solutions being equally suitable. Accordingly, the aforementioned omission does not confront the reader of the amended patent with new, previously undisclosed subject-matter.

2.2 Claim 1 according to the first auxiliary request:

The application documents as originally filed disclose that strap log data is sent to the center console ("controller means"). This strap log data comprises machine and cassette number data as well as data relating to the run, batch, card, bundle and strap number and the number of fit and unfit notes (cf. column 22, line 5 to column 23, line 58; and Figures 21 to 24, 27 of the application as published).

As to the fact that the claim only refers to the transmission of machine and cassette number data for preparing log data, the respondent has argued that the application documents as originally filed did not provide any basis for the isolation of these data. However, from the originally filed application as a whole it becomes apparent that specifically the machine and cassette number data are relevant in the context of the apparatus comprising plural inspection devices and cassettes as claimed, as they allow for a direct correlation between the inspection results and the different parts of the apparatus. The remaining data are less relevant in this context, justifying their omission in the claim.

2.3 Claim 1 according to the second auxiliary request:

The further limitation introduced in claim 1 according to the second auxiliary request also is derivable from the application documents as originally filed (cf. column 6, lines 44 to 47, of the application as published).

2.4 Hence, in the Board's opinion, claim 1 according to all requests is admissible under Article 123(2) EPC.

2.5 Claim 1 according to all requests contains further limitations with respect to claim 1 as granted. Thus the requirements of Article 123(3) EPC are considered to be met.

3. *Inventive step*

3.1 Main request:

The closest prior art for an apparatus according to claim 1 of the main request is considered to be provided by document D2'.

From document D2' an apparatus with all the features of the preamble of claim 1 is known (cf. Figure 1 of the contested patent and Figure 2A of document D2'). In particular, in document D2' an operator at the control unit (100) performing a manual inspection (cf. Figure 2A; page 38, lines 25 to 30) provides the "unidentifiable sheet processor means" as required by the claim under consideration. In this respect, it is noted that in the embodiment of the contested patent similarly an operator performing a manual inspection is envisaged (cf. column 22, line 57 to column 23,

line 14, of the patent specification).

Furthermore, as held by the respondent, it is known from document D2' (cf. page 41, lines 23 to 25) to connect the control unit to a plurality of inspecting devices.

Accordingly, the apparatus of claim 1 differs from that known from document D2' in that:

- the unidentifiable sheet processor means is electrically connected to each of said inspecting devices and is adapted to receive the cassette means from each inspecting device and to determine the number of unidentifiable sheets in the cassette means regardless of the processing speed of each of the inspecting devices;
- a bundle processor is connected to said inspecting devices through respective pre-processors (16) and a conveyor for conveying bundles, said pre-processors fetching bundles from said conveyor, said bundle processor includes a first counting means for detecting the number of sheaves of a bundle,
- means for transferring a bundle to said conveyor when the number of sheaves of that bundle detected by the counting means coincides with a predetermined number and means for rejecting that bundle when the number of sheaves of that bundle detected by the counting means does not coincide with the predetermined number; and
- rejecting means is provided at one end of the

conveyor and serves as a storing box for storing a bundle which the pre-processors fail to fetch.

These differences constitute an aggregation of features which address distinct partial aspects of providing a higher degree of automation of the apparatus.

In view of the fact that in document D2' the "unidentifiable sheet processor means" are provided at the control unit (100), it would have been obvious to the skilled person, in an arrangement with a single controller unit (100) electrically connected to a plurality of inspecting devices, to also provide single "unidentifiable sheet processor means" electrically connected to the plurality of inspecting devices.

Moreover, in document D2' it is already suggested to use a conveyor to supply e.g. bundles ("Bündel"), defined as banded sheaves (cf. page 8, lines 15 to 18), to an inspecting device (see Figure 2C; page 12, lines 11 to 22). Although document D2' does not give any specific information as to the processing of bundles, the provision of a "pre-processor", fetching the bundles from the conveyor, would have been obvious to the skilled person. Also the provision of a "bundle processor" for transferring bundles to the conveyor would have readily occurred to him. Furthermore, in a configuration with a plurality of inspecting devices, it would have been obvious to him, when faced with the task of providing an automated and efficient system, to use the conveyor for serving all the inspecting devices.

The provision of a storing box at the end of the conveyor would also have been an evident measure for

the skilled person faced with the problem that bundles reach the end of the conveyor without having been fetched by any of the pre-processors of the inspecting devices.

According to the remaining feature of claim 1, the bundle processor includes counting means for detecting the number of sheaves of a bundle and means for transferring a bundle to the conveyor when the number of sheaves of that bundle detected by the counting means coincides with a predetermined number and means for rejecting that bundle when the number of sheaves of that bundle detected by the counting means does not coincide with the predetermined number.

In a sheet processing apparatus underlying the present patent, typically operated by bank note issuing agencies, the principle is that banks turn in standardised units (sheaves, bundles etc.) of used bank notes and receive bank notes in return of a certified quality. In particular, worn out and counterfeit bank notes are sorted out and removed. Obviously, for accounting purposes, it is of paramount importance that the exact number of turned-in bank notes is identified. For example, to this end, in the detailed embodiment of document D2', where the accounting unit at inspection ("collation unit") is a standardised banded sheave with 100 bank notes of a single, specified value, the deviation of the actual number of bank notes in each sheaf is recorded and linked to the identity of the person who banded the sheaves for the submitting bank (cf. document D2', page 40, first and third paragraphs). Furthermore, for accounting purposes, the exact number of turned-in sheaves must be known. In the detailed embodiment for instance, the input consists of

a stack of 10 sheaves (cf. document D2', page 14, lines 21 to 26).

As discussed above, document D2' already suggests the input of bundles (10 bound sheaves of each 100 bank notes) via a conveyor as an alternative. Also in this case the total number of sheets stemming from a supplier (bank) must be counted for the above-discussed accounting purposes. This implies counting the number of sheets in each sheave as well as counting the number of sheaves from a supplier. Obviously, one straightforward way of counting the number of sheaves would be to count the number of sheaves in each bundle at an early stage, i.e. when transferring the bundle to the conveyor, with the possibility of rejecting the bundle in case of non-compliance.

Regarding the alleged particularly efficient way of processing bundles in parallel, submitted by the appellant, whereby a bundle is unbound and the sheaves are evenly distributed over the plurality of parallel inspecting devices, it is noted that the claim under consideration does not define such an even distribution, neither would such distribution be supported by the description. On the contrary, the description of the embodiments relies on the bundles being bound by bands which are only removed in the pre-processors. Accordingly, since the alleged effect is not necessarily obtained in all apparatuses falling under the terms of the claim, it is irrelevant to the issue of inventive step.

Accordingly, in the Board's opinion, the skilled person would have arrived at the subject-matter of claim 1 according to the main request without the exercise of

inventive skills.

3.2 First auxiliary request:

Claim 1 according to the first auxiliary request defines, in addition to claim 1 of the main request, that machine number data on each inspecting device and cassette number data on the cassette means are transmitted to the controller means and the controller means prepares log data.

In this context, it is already known from document D2' (cf. page 38, line 25 to page 39, line 23) to prepare unit log data including machine number data and to display it at the control. This data is transmitted from the inspection device to the control unit. As regards the necessary correlation between transmitted inspection data and the corresponding content of a cassette, this is obtained by means of unique identification numbers of "separator cards" added to each cassette. However, it would have readily occurred to the average practitioner, as an alternative, to directly attribute a unique number to each cassette and to provide the required correlation by using this cassette number. Obviously, this would imply reading the cassette number at inspection and transmitting the cassette number together with the inspection data to the control unit.

Accordingly, in the Board's view, the skilled person would have arrived at the subject-matter of claim 1 according to the first auxiliary request without the exercise of inventive skills.

3.3 Second auxiliary request:

Claim 1 according to the second auxiliary request defines, in addition to claim 1 of the main request, that the first counting means counts the detected boundaries of straps in the respective bundle, thereby detecting the number of sheaves.

The appellant argued that other ways of counting sheaves such as weighting or passing them individually through a light barrier would have been conceivable. He thus concluded that this additional feature provided an inventive selection. However, in the Board's opinion, counting the detected boundaries of the straps is one of the most straightforward possibilities the average practitioner would consider, not least because it corresponds in substance to how an operator would typically verify at a glance the number of sheaves in a bundle.

Therefore, no inventive step is recognised for the subject-matter of claim 1 according to the second auxiliary request either.

- 3.4 Consequently, neither the subject-matter of claim 1 according to the main request nor the subject-matter of claim 1 according to the first and second auxiliary requests involves an inventive step in the sense of Article 56 EPC, contrary to the requirements of Article 52(1) EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

R. Schumacher

G. Davies