Internal distribution code:

(A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

Datasheet for the decision of 10 September 2019

Case Number: T 2281/17 - 3.5.05

Application Number: 11185865.0

Publication Number: 2447826

IPC: G06F3/12

Language of the proceedings: EN

Title of invention:
System and methods of balancing workload across multiple cells in cellular manufacturing

Applicant:
Xerox Corporation
Palo Alto Research Center Incorporated

Headword:
Balancing workload across multiple cells in cellular printing environment / Xerox

Relevant legal provisions:
EPC Art. 123(2), 56

Keyword:
Inventive step - auxiliary request (yes)
Scope of protection sought does not encompass clearly trivial cases

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 2281/17 - 3.5.05

D E C I S I O N
of Technical Board of Appeal 3.5.05
of 10 September 2019

Appellant: (Applicant 1)	Xerox Corporation Xerox Square - 20A 100 Clinton Avenue South Rochester, NY 14644 (US)
Appellant: (Applicant 2)	Palo Alto Research Center Incorporated 3333 Coyote Hill Road Palo Alto, California 94304 (US)
Representative:	Gill Jennings & Every LLP The Broadgate Tower 20 Primrose Street London EC2A 2ES (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 22 May 2017 refusing European patent application No. 11185865.0 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chair	A. Ritzka
Members:	N. H. Uhlmann
	G. Weiss

Summary of Facts and Submissions

The appeal is against the examining division's decision to refuse European patent application No. 11185865.0.

I. In the course of the first instance proceedings, the following documents were referred to:

D1 US 2008/144084;
D2 US 2005/264832;
D3 "FreeFlow Output Manager User Guide - Version 9.0", 30 September 2010, Retrieved from the Internet: URL:http://download.support.xerox.com/pub/docs/FF_Output_Manager/userdocs/any-os/en_GB/701P50820_OutputMgr90_UserGuide.pdf;
D4 KERR R M: "A KNOWLEDGE BASED, INTEGRATED PROCESS PLANNING AND SCHEDULING SYSTEM FOR DOCUMENT PREPARATION", ADVANCES IN PRODUCTION MANAGEMENT SYSTEMS, 1 January 1991;
D5 Sanja Petrovic ET AL: "JOB SHOP SCHEDULING WITH LOT-SIZING AND BATCHING IN AN UNCERTAIN REAL-WORLD ENVIRONMENT", 22 June 2005, Retrieved from the Internet: URL:http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.67.92&;rep=rep1&type=pdf.

II. The examining division held that the requests on file do not meet the requirements of Article 123(2) EPC. Furthermore, the examining division added supplementary comments based on Articles 56 and 84 EPC.

III. In a statement setting out the grounds of appeal, the appellant requested that the decision under appeal be set aside and a patent be granted based on the claims of the main request or auxiliary requests 1 or 2 and drawings and description on which the decision under appeal was based.

IV. The board arranged for oral proceedings to be held.

V. In the summons, the board set out its provisional view of the case. The board considered that none of the pending requests met the requirements of Articles 123(2) EPC and provided comments on the inventive step of the claims of the main request and auxiliary request 1.

VI. In response, by letter dated 7 August 2019, the appellant filed amended versions of the main request and auxiliary requests 1 and 2, and submitted further arguments.

VII. Oral proceedings were held on 10 September 2019 and attended by the appellant's representatives.

VIII. The appellant requested that the decision under appeal be set aside and that the patent be granted based on the claims of the main request or auxiliary requests 1 or 2 submitted with its letter dated 7 August 2019.

IX. Claim 1 of the main request reads as follows:

"A method of balancing printing workload across multiple cells in a cellular printing environment, the method comprising:

compiling a listing of a plurality of jobs (504) and cells using a computer operable processor (300), wherein each of the plurality of jobs are to be produced by at least some of the plurality of cells, and each of the cells include at least one production device (110, 112);

enumerating all feasible routes in the cellular printing environment that have the minimum number of inter-cell hops;

assigning the jobs to the cells using an earliest-completion-route algorithm, wherein a specific job is

assigned to a specific cell that provides an earliest completion time for the specific job; and

generating a job schedule for job production based on the results of the earliest-completion-route algorithm."

X. Claim 1 of auxiliary request 1 reads as follows:

"A method of balancing printing workload across multiple cells in a cellular printing environment, the method comprising:

compiling a listing of a plurality of jobs (504) and cells using a computer operable processor (300), wherein each of the plurality of jobs are to be produced by at least some of the plurality of cells, and each of the cells include at least one production device (110, 112);

assigning the jobs to the cells using an earliest-completion-route algorithm by, for each job:

enumerating all feasible routes in the cellular printing environment that have the minimum number of inter-cell hops;

for each enumerated route, finding a schedule that uses only those cells identified by the route; and

selecting the route and the corresponding schedule that finishes the job the earliest; and

generating a job schedule for job production based on the results of the earliest-completion-route algorithm."

XI. In view of the outcome of the appeal proceedings, the wording of the claims of auxiliary request 2 does not need to be reproduced.

Reasons for the Decision

Main request

1. Patentability

1.1 According to claim 1, the enumerated routes are not taken into consideration in the "assigning" and "generating" steps. In particular, "a specific job is assigned to a specific cell" and no assignment of jobs to routes takes place. Indeed, the "earliest-completion-route algorithm", apart from including the word "route" in its name, does not refer to any route-related aspects.
Although the description sets out some details of this algorithm, these details are not specified in claim 1. Details which are only mentioned in the description do not constitute a further limitation on the subject-matter claimed.
Consequently, the "enumerating" step cannot contribute to any technical effect.

1.2 The appellant argued that a skilled person trying to make technical sense of the claim's teaching would implicitly infer that the "assigning" step operates on the routes enumerated in the "enumerating" step.

The board disagrees, because the "assigning" step clearly refers to cells only.

1.3 The "generating" step does not lead to any technical effect because the jobs are assigned to cells in the course of the "assigning" step, and the generated "job schedule for the job production" could only serve as documentation of this assignment.

1.4 The feature "a specific job is assigned to a specific cell that provides an earliest completion time for the specific job" is anticipated by the "Shortest [Remaining] Processing Time (SPT)" scheduling policy, as disclosed in paragraphs 35, 36 and 47 of prior-art document D1. This document relates to a similar printing environment comprising multiple cells.

1.5 In view of these arguments, the subject-matter of claim 1 does not involve any inventive step over document D1.

Auxiliary request 1

2. Amendments

Present claim 1 is based on claim 7 as originally filed and paragraphs 46 to 49 of the description. The requirements of Article 123(2) EPC are therefore met.

3. Patentability

3.1 Claim interpretation

From the wording in claim 1 "enumerating all feasible routes" and "selecting the route", the skilled person would conclude that the claimed subject-matter is directed at balancing printing workload when more than one feasible route is present. While paragraph 48 of the description refers to "at least one feasible route", it is clear that the trivial case of only one feasible route is not covered by the wording of claim 1, since it refers to routes in plural.

3.2 Document D1 forms a suitable starting point for inventive-step analysis. D1 specifies that a job is assigned to one or two cells (paragraphs 31 and 32) according to the capabilities of the cells. However, document D1 does not refer to situations in which

different groups of cells may possess the capabilities needed for producing a job, and in which a selection between these routes is made without taking the number of inter-cell hops into consideration.

Consequently, the following features of claim 1 are not disclosed in D1:

"enumerating all feasible routes in the cellular printing environment that have the minimum number of inter-cell hops;

for each enumerated route, finding a schedule that uses only those cells identified by the route; and

selecting the route and the corresponding schedule that finishes the job the earliest".

3.3 The distinguishing features lead to the technical effect of generating a more efficient job schedule by minimising of the inter-cell hops.

3.4 Hence, the objective technical problem to be solved is to adapt the teaching of document D1 to generate a more efficient job schedule.

3.5 The skilled person would not arrive at the solution as claimed in an obvious manner. Neither document D1 nor the other prior-art documents at hand relate to a plurality of routes of cells. Consequently, the aspect of minimising inter-cell hops does not play any role. Moreover, document D1 refers to a different technique for optimising job schedules, by selecting one of a plurality of possible job sequencing rules (paragraphs 35 to 38).

3.6 For these reasons, the subject-matter of claim 1 involves an inventive step within the meaning of Article 56 EPC.

3.7 Independent claim 3 is directed to a system comprising features corresponding to the method steps of claim 1. Therefore, its subject-matter involves an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent on the basis of claims 1 to 3 of auxiliary request 1, which was submitted with the letter dated 7 August 2019, and a description and drawings to be adapted thereto.

The Registrar: The Chair:

K. Götz-Wein A. Ritzka

Decision electronically authenticated