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**Datasheet for the decision  
of 15 May 2023**

**Case Number:** T 0384/21 - 3.5.05

**Application Number:** 16187726.1

**Publication Number:** 3168737

**IPC:** G06F3/06

**Language of the proceedings:** EN

**Title of invention:**

DISTRIBUTED MULTIMODE STORAGE MANAGEMENT

**Applicant:**

Samsung Electronics Co., Ltd.

**Headword:**

Storage partition management/SAMSUNG

**Relevant legal provisions:**

EPC Art. 56

RPBA Art. 13(2)

**Keyword:**

Inventive step - (no)

Late-filed auxiliary request - admitted (no)



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Case Number: T 0384/21 - 3.5.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.05**  
**of 15 May 2023**

**Appellant:** Samsung Electronics Co., Ltd.  
(Applicant) 129, Samsung-ro  
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**Representative:** Kuhnen & Wacker  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 17 November  
2020 refusing European patent application No.  
16187726.1 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chair** A. Ritzka  
**Members:** P. Cretaine  
E. Mille

## **Summary of Facts and Submissions**

I. This appeal is against the examining division's decision posted on 17 November 2020 refusing European patent application No. 16187726.1. The application was refused on the grounds that a main request and an auxiliary request did not meet the requirements of Article 56 EPC in view of the disclosure of:

D1: US 8 639 669

and the common general knowledge, as illustrated by:

D2: US 2012/0297122

In addition, dependent claims 13 to 19 of the main request were found to be non-compliant with the requirements of Article 123(2) EPC.

II. Notice of appeal was received on 25 January 2021, and the appeal fee was paid on the same date. The statement setting out the grounds of appeal was received on 9 March 2021. The appellant requested that the decision be set aside and that a patent be granted on the basis of a main request filed with the statement setting out the grounds of appeal. Oral proceedings were requested as an auxiliary measure.

III. A summons to oral proceedings was issued on 5 July 2022. In a communication pursuant to Article 15(1) RPBA, sent on 29 March 2023, the board gave its preliminary opinion that the main request did not meet the requirements of Article 56 EPC in view of D1 and the common general knowledge as illustrated by D2.

- IV. By letter dated 17 April 2023, the appellant submitted a new auxiliary request.
- V. Oral proceedings were held on 15 May 2023. The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the set of claims of a main request filed with the statement setting out the grounds of appeal or, alternatively, of an auxiliary request submitted with the appellant's letter dated 17 April 2023. The board's decision was announced at the end of the oral proceedings.
- VI. Claim 1 of the main request reads as follows:

"A distributed storage system comprising:  
a plurality of appliances (710; 2701; 2810, 2820, 2830, 2840, 2850, 2860, 2870, 2880; 3510, 3520, 3530, 3540, 3550, 3560, 3570, 3580) wherein at least one of the plurality of appliances (710; 2701; 2810, 2820, 2830, 2840, 2850, 2860, 2870, 2880; 3510, 3520, 3530, 3540, 3550, 3560, 3570, 3580) includes a plurality of storage devices (750; 2891, 2892, 2893, 2894);  
a distributed multimode storage management coordinator that includes a plurality of multimode storage management systems (720; 2710) configured to direct conveyance of information to the plurality of storage devices (750; 2891, 2892, 2893, 2894); and  
a communication mechanism (2705; 2890; 3590) for communicating messages between the plurality of multimode storage management systems (720; 2710), including distributed multimode storage management messages,  
wherein each of the plurality of storage devices (750; 2891, 2892, 2893, 2894) includes:

a first storage partition (770) including a basic type of interface (772) and a first information storage region (777) configured to store a first type of information; and

a second storage partition (780) including a second information storage region (787) that stores a second type of information,

**characterized in that** the second storage partition (780) includes a selective underlying exposure (SUE) interface (782),

wherein the plurality of multimode storage management systems (720; 2710) include multimode selective underlying exposure (SUE) management systems (745) configured to direct file activities of the second storage partition (780) via a SUE interface (782), wherein the SUE interface (782) exposes an aspect of the second information storage region (787) by being configured to translate a SUE address block (798) in a SUE address space to a physical address block (799) in a physical address space of the second information storage region (787), wherein each SUE page addressed by a SUE address block (798) in the SUE address space includes a plurality of physical pages in the physical address space that are jointly programmed."

Claim 1 of the auxiliary request differs from claim 1 of the main request in that the wording "wherein the SUE interface (782) exposes an aspect of the second information storage region (787)" is replaced by the wording "wherein the SUE interface (782) exposes a physical aspect of the second information storage region (787)".

### **Reasons for the Decision**

1. Main request

1.1 Admission

The main request was submitted with the statement setting out the grounds of appeal. The request includes claims 1 to 12, which are identical to claims 1 to 12 of the previous main request on which the decision is based. Taking into account that the filing of the main request successfully overcomes the Article 123(2) EPC objection raised against claims 13 to 19 of the previous main request and does not introduce any complexity into the case, the board has decided to admit the main request into the appeal proceedings under the provisions of Article 12(4) RPBA.

2. Inventive step

It was common ground at the oral proceedings that D1 was the closest prior art.

The board agrees with the findings of the decision in point 1.2.1 that D1 discloses most of the features of claim 1. In particular, the first storage partition of claim 1 can be read onto the Metadata Storage Unit of D1 (see reference signs 110 and 111 in Figure 1), and the second storage partition of claim 1 can be read onto the Data Chunks Storage Unit of D1 (see reference signs 112 and 113 in Figure 1). The access to a Metadata Storage Unit of D1 only needs a basic type of interface since metadata is not de-duplicated data. The board further agrees with the decision that the access to a Data Chunks Storage Unit of D1 needs a specific type of interface since the user data has been de-duplicated when stored in such a storage unit.

Contrary to what the appellant has argued, the board holds that a specific interface of this kind should expose to the client information about how the user data stored in the Data Chunks Storage Unit has been de-duplicated. The board thus agrees with the decision that this specific interface disclosed in D1 falls under the broad and vague definition of a selective underlying exposure (SUE) interface, which exposes an aspect of the second storage partition, as defined in claim 1.

The subject-matter of claim 1 thus differs in substance from the disclosure of D1 only in that, in the second storage partition, each SUE page addressed by an SUE address block in the SUE address space includes a plurality of physical pages that are jointly programmed, as stated in point 1.2.3 of the decision and as acknowledged by the appellant in its response to the board's communication.

The appellant argued that the technical effect of this feature was that fewer logical address translations were needed for accessing the data stored in the physical pages of the second partition, thereby increasing the access speed. According to the appellant, this is illustrated in Figure 7 of the application in hand, with the partition on the left-hand side of the figure needing fewer logical address translations than the partition on the right-hand side, due to the use of the SUE address block and SUE address space partition.

However, the board notes that Figure 15 of the application in hand, describing address mapping from logical address to SUE address, shows that the SUE addressable units 1503-1505 are built on logical blocks

LBA 1521-1578. Moreover, paragraph [0108] of the description describes that the SUE address space is a logical one. Thus, the SUE address space partition 780 shown in Figure 7 is logical, like the logical address space partition 750, implying that the number of address translations needed for the second partition is not actually lower than the number of address translation needed for the first partition. The technical effect claimed by the appellant is thus not achieved.

Moreover, the above-mentioned distinguishing feature is a common measure in the technical field of solid-state drive storage devices, which are the kind of storage devices that D1 considers for implementing the second storage partition (see column 3, lines 51 to 59 of D1). An illustration of this common general knowledge is given in D2 (see paragraph [0106]: "... instead of tracking each page 62 independent, a group of pages is tracked as one unit").

For these reasons, the board holds that the subject-matter of claim 1 does not involve an inventive step (Article 56 EPC) having regard to D1.

3. Auxiliary request

This request was filed in response to the board's communication. The appellant argued that the amendments had been made to further distinguish the invention from the disclosure of D1. However, the board notes that the inventive step objection based on D1 raised by the board in its communication is quite similar to the inventive step objection on the basis of which the main request was refused. Therefore the board does not see any cogent reasons for filing this request at this

stage of the proceedings. As a consequence, the board decided at the oral proceedings not to admit the auxiliary request into the appeal proceedings, pursuant to Article 13(2) RPBA.

## Order

### **For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chair:



K. Götz-Wein

A. Ritzka

Decision electronically authenticated