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Case Number: T 2180/08 - 3.5.03

Application Number: 02729564.1

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Title of invention:
Control system

Patentee:
Sharp Kabushiki Kaisha

Opponent:
-

Headword:
Control system/SHARP

Relevant legal provisions:
EPC Art. 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step (main request) - yes"

Decisions cited:
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Case Number: T 2180/08 - 3.5.03

D E C I S I O N
of the Technical Board of Appeal 3.5.03
of 22 November 2011

Appellant: Sharp Kabushiki Kaisha
22-22, Nagaike-cho
Abeno-ku
Osaka-shi, Osaka 545-8522 (JP)

Representative: Jones, Nicolas
R.G.C. Jenkins & Co
26 Caxton Street
London SW1H 0RJ (GB)

Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 27 June 2008 refusing European patent application No. 02729564.1 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: A. S. Clelland
Members: A. J. Madenach
M-B. Tardo-Dino

Summary of Facts and Submissions

I. The present appeal is against the decision of the examining division to refuse application No. 02729564.1 on the ground that the subject-matter of claims 1 and 7 of a main and of an auxiliary request did not involve an inventive step (Article 56 EPC). Reference was made to:

D1: M. Munson et al.: "Flexible internetworking of devices and controls", IECON '99 Proceedings. The 25th annual conference of the IEEE Industrial Electronics Society, San Jose, CA, USA 29 November - 3 December 1999, USA, vol. 3, pages 1139-1145; and

D2: K. Edwards: "Core Jini", Pages 64 to 76, 147 and 244, Prentice Hall PTR, Indianapolis, USA, June 1999.

II. The appellant requested that the decision of the examining division be set aside and a patent be granted on the basis of claims according to a main request or first auxiliary request both filed on 13 May 2008 or, in the alternative, on the basis of claims according to a second or third auxiliary request filed with the grounds of appeal. As an auxiliary measure, oral proceedings were requested if neither the main nor first auxiliary request were considered allowable.

III. The board summoned the appellant to oral proceedings. In a communication accompanying the summons, the board gave its preliminary opinion.

IV. The oral proceedings took place on 22 November 2011. The appellant confirmed its previous requests.

At the end of the proceedings, the chairman announced the board's decision.

V. Independent claim 1 according to the main request reads as follows:

"A control system including a first network including a controller (1), a second network including one or more controlled devices (3-6), and a gateway (2) directly or indirectly connected with said first network and with said second network, wherein

said controlled device has a private address in the second network and comprises a controlled device information management unit (23), which is arranged to manage an object which is controlled device information about the controlled device including the private address of the controlled device in the second network and a controlled device information communication unit (24) which is arranged to send said controlled device information to said gateway with appropriate timing,

said controller is arranged to issue an inquiry to the gateway for matching controlled device information with the controller’s requirements, and to issue to said gateway operating instructions for operating said controlled device to execute a selected operation method, and

said gateway comprises a means for issuing to said controlled device operating instructions for operating said controlled device identified by the private address regarding said controlled device that is included in said controlled device information, wherein

said object includes information about operation methods for operating the controlled device;

said gateway comprises a controlled device information proxy creating means (32) which is arranged to create controlled device information proxies including the object acquired from the controlled devices, information for the execution of the operation method and a global address of the gateway in the first network, and an information managing means (31) for registering and managing said object and said controlled device information proxies; and

said controller, to perform said matching, is arranged to acquire said controlled device information proxies from said gateway and issue said operating instructions to said gateway identified by the global address regarding said gateway that is included in said controlled device information proxies."

Claim 7 according to the main request reads as follows:

"A gateway suitable for use in a control system according to claim 1, said gateway comprising means for issuing to said controlled device operating instructions for operating said controlled device identified by the private address regarding said controlled device that is included in said controlled device information, characterised in that said gateway includes:

a controlled device information proxy creating means (32) which is arranged to create said controlled device information proxies including the controlled device information acquired from the control devices and information for the execution of the operation method and a global address of the gateway and an

information managing means (31) for registering and managing said controlled device information and said controlled device information proxies;

the gateway further comprising:

a means for detecting when said controlled device information of said controlled devices is registered in said information managing means,

a means for automatically creating said controlled device information proxies from said controlled device information registered in said information managing means, and

a means for registering created controlled device information proxies in said information managing means."

In view of the board's decision it is not necessary to recite the claims of the auxiliary requests.

Reasons for the decision

1. *Claim 1 according to the main request, inventive step (Article 56 EPC):*

1.1 The claimed invention concerns a control system in which a controller located in one network is able to control one or more controlled devices located in a different network, the two networks being interconnected via a gateway (see for example paragraphs [0005], [0013] and [0015] of the application as published). The core feature of the claimed invention concerns the structure and function of the gateway in combination with controlled device information management units (see paragraph [0014]).

1.2 Document D1, which was considered by the examining division to represent the closest prior art, discloses a control system including a first network including applications or users (controller in the terminology of claim 1), a second network including one or more services (controlled devices in the terminology of claim 1), and a gateway directly or indirectly connected with said first network and with said second network (e.g. page 1140, left-hand column, lines 33-43; right-hand column, lines 10-23; Figure 2). The second network is a subnet having an internal protocol (page 1140, left-hand column, lines 41-43) and may comprise legacy non-Java systems (page 1140, right-hand column, lines 13-16).

Applications or users and devices communicate via an IP backbone (see e.g. page 1144, right-hand column, lines 4-9) and an intervening so-called middleware, TSpaces, which is described in detail in D1. When a legacy subsystem is connected to the communication system gateways (also bridge or proxy, see page 1140, right-hand column, lines 14-17 and 22-24, Figure 2) these provide protocol conversion, in particular a common IP address (page 1140, left-hand column, lines 38-43).

The examining division's decision is based on the understanding that a gateway in the sense of the claim does not require a unitary structure such that in D1 the combination of the proxies, which are linked to legacy subsystems, and TSpaces servers can together be considered to form gateways in the sense of the claim. The board agrees.

Based on such an interpretation, D1 discloses that a gateway provides a common IP address for the devices within its sub-network, and that accordingly a device address consists of both the gateway address and the internal address (page 1140, left-hand column, lines 38-43). Accordingly, the controlled device has a private address in the second network. It also comprises a controlled device information management unit, which is arranged to manage controlled device information about the controlled device including the private address of the controlled device in the second network and a controlled device information communication unit which is arranged to send said controlled device information to said gateway with appropriate timing (page 1140, left-hand column, lines 38-44; page 1142, left-hand column, lines 2-15; Figure 2). Furthermore, said gateway comprises a means for issuing to said controlled device operating instructions for operating said controlled device identified by the private address regarding said controlled device that is included in said controlled device information (see page 1140, left-hand column, lines 38-44; page 1141, right-hand column, lines 23-29). This was in fact conceded by the appellant.

Finally and contrary to the appellant's analysis (point 17 of the grounds of appeal), the controller is arranged to issue an inquiry to the gateway for matching controlled device information with the controller’s requirements, and to issue to said gateway operating instructions for operating said controlled device to execute a selected operation method (page 1144, right-hand column, lines 24-26).

1.3 The claimed subject-matter differs from the known control system essentially as regards the nature of the gateway.

In particular according to the claim, the controlled device information is represented in the form of an object that includes information about operation methods for operating the controlled device. Furthermore, the gateway according to claim 1 comprises a controlled device information proxy creating means which is arranged to create controlled device information proxies including the object acquired from the controlled devices, information for the execution of the operation method and a global address of the gateway in the first network, and an information managing means for registering and managing said object and said controlled device information proxies. Finally, the control system, to perform the matching, is arranged to acquire said controlled device information proxies from said gateway and issue said operating instructions to said gateway identified by the global address regarding said gateway that is included in said controlled device information proxies.

1.4 The technical problem to be solved by the present invention may be regarded as how to improve the translation of operating instructions issued by a controller in a first network into instructions that are executable by a controlled device in a second network using private addresses and protocols, in order to avoid translation of operating instructions at a gateway.

1.5 The board essentially agrees with the reasoning of the examining division that in order to solve the above problem the skilled person would have made use of techniques known in connection with the JINI architecture as indeed discussed at paragraph [0025] of the printed application. The basic procedures performed by a lookup service provided by JINI are shown in Figures 4(A) to 4(C) of the application. These procedures essentially correspond to those described in relation to Figures 3-1 to 3-3 in the detailed account of the concepts of JINI in D2.

According to D2:

- said controlled device information, which in D2 corresponds to the service item including proxy and attributes as shown in Figure 3-1, is represented in the form of an object (e.g. D2, page 72, line 7) which includes information about operation methods for operating the controlled device, which in the example discussed in D2 is a printer (page 72, lines 7-24; and figures 3-1, 3-3);

- said gateway, which in D2 corresponds to the "Lookup Service", comprises a means for publishing a service proxy, that is for creating a controlled device information proxy including the object acquired from the controlled devices, and information for the execution of the operation method (page 69, lines 5-21 and page 70, line 3 - page 71, line 2). The gateway furthermore comprises an information managing means for registering and managing said object and said controlled device information proxies (*ibidem*), and

- said controller ("client" in the terminology of D2), to perform said matching, is arranged to acquire said controlled device information proxies ("proxy object" in the terminology of D2) from said gateway ("Lookup Service" in the terminology) and issue said operating instructions to said gateway (Figure 3-3: "client communicates with service via proxy", and page 73, line 5 - page 74, line 8).

1.6 However, an implementation of the JINI architecture as exemplified in D2 in the control system known from D1 would not provide the feature that the control system, to perform the matching, is arranged to acquire said controlled device information proxies from said gateway and issue said operating instructions to said gateway identified by **the global address** regarding said gateway that is included in said controlled device information proxies.

This feature is understood as meaning that the gateway for both receiving information from the controlled devices and sending instructions to them has the same global address.

D2 contains nothing relating to a global address of the gateway, *i.e.* the lookup service, whilst D1 points to a different solution involving two global addresses for the gateway, depending on whether controlled device information is acquired or operating instructions are issued. As can be seen in Figure 2 on page 1144 of D1, the user, *i.e.* the controller in the terminology of claim 1, receives controlled device information proxies from a first TSpaces server (shown on the left side of each Figure; and page 1144, right column, lines 10-13

and lines 24-26), which in combination with the shown proxies corresponds to the claimed proxy as has been previously stated, and issues operating instructions to another TSpaces server (named "EventSpace", shown on the right side of each Figure; and page 1144, right column, lines 27-31).

In the board's view, the fact that these two TSpace servers are shown as distinct items makes it probable that they have different global addresses in the first network.

Even if for the sake of argument the skilled person would find it obvious to make use of the JINI architecture in the D1 control system, he would have no reason to abandon the teaching of D1, which explicitly relies on plural TSpace servers distributed in the first network, and provide an arrangement making use of a single server with a common global address.

1.7 The further documents cited in the international search report and the supplementary European search report being of less relevance, the board concludes that the subject-matter of claim 1 was not obvious to the skilled person.

2. *Claims 2 - 7 of the main request, inventive step (Article 56 EPC):*

2.1 Independent claim 7 relates to a gateway suitable for use in a control system according to claim 1. According to claim 7, the gateway includes a controlled device information proxy creating means which is arranged to

create controlled device information proxies including *inter alia* a global address of the gateway. The gateway furthermore comprises means for issuing controlled device operating instructions. Hence, the claimed gateway comprises the two elements necessary for the controller to perform the matching according to claim 1, *i.e.* the acquisition of the controlled device information proxy and the issuance of operating instructions, using a gateway having a single global address.

For the reasons set out above in relation to the subject-matter of claim 1, the combination of the teaching of documents D1 and D2 points to a control system having one gateway suitable for the acquisition of the controlled device information proxy and another gateway suitable for the issuance of operating instructions.

Hence on the basis of the teaching of D1 and D2, it would not have been obvious for the skilled person to provide a single gateway performing the two tasks.

The further documents cited in the international search report and in the supplementary European search report are of less relevance. Therefore, the subject-matter of claim 7 was not obvious to the skilled person.

2.2 The claims 2 to 6 are dependent on claim 1. As a consequence, their subject-matter involves an inventive step.

3. *Remittal*

The board has noted several discrepancies between the originally filed Figures and the description. This matter, and any necessary adaptation of the description to the claims, requires the attention of the examining division.

Order

For these reasons it is decided that:

- The decision under appeal is set aside.

- The case is remitted to the department of first instance for further prosecution on the basis of the claims of the main request as submitted on 13 May 2008.

The Registrar The Chairman

G. Rauh A. S. Clelland