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G06F 1/20 (2006.01)

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(56) List of the documents referenced in the Search Report: **US 2010/0246118 A1, 30/09/2010. US 6,371,157 B1, 16/04/2002. US 2011/0075353 A1, 31/03/2011. RU 2 297 661 C2, 20/04/2007. RU 2 284 051 C2, 20/09/2006. RU 2 289 841 C1, 20/12/2006.**

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(54) LIQUID-COOLING SYSTEM FOR ELECTRONIC DEVICES

(57) Abstract:

The invention relates to cooling systems and, in particular, to liquid-cooling systems for electronic devices. The technical result is to increase the efficiency of the technological process for the maintenance of complex electronic devices. In a liquid-cooling system for cooling several electronic devices, each container additionally contains a device for fast removal (discharging) of liquid coolant from the container, while the device for fast removal of coolant contains at least a drainage hole which is sealed during normal operation of the device and open at the initial phase of removing the container with the electronic device from the support, and the drainage hole of the device for fast removal of coolant is made on the container and provided with a seal, and the drain cover is rigidly attached to the support such that when mounting the electronic device with the container on the support, the drainage hole on the container is sealed. 3 dependent claims, 13 figures.

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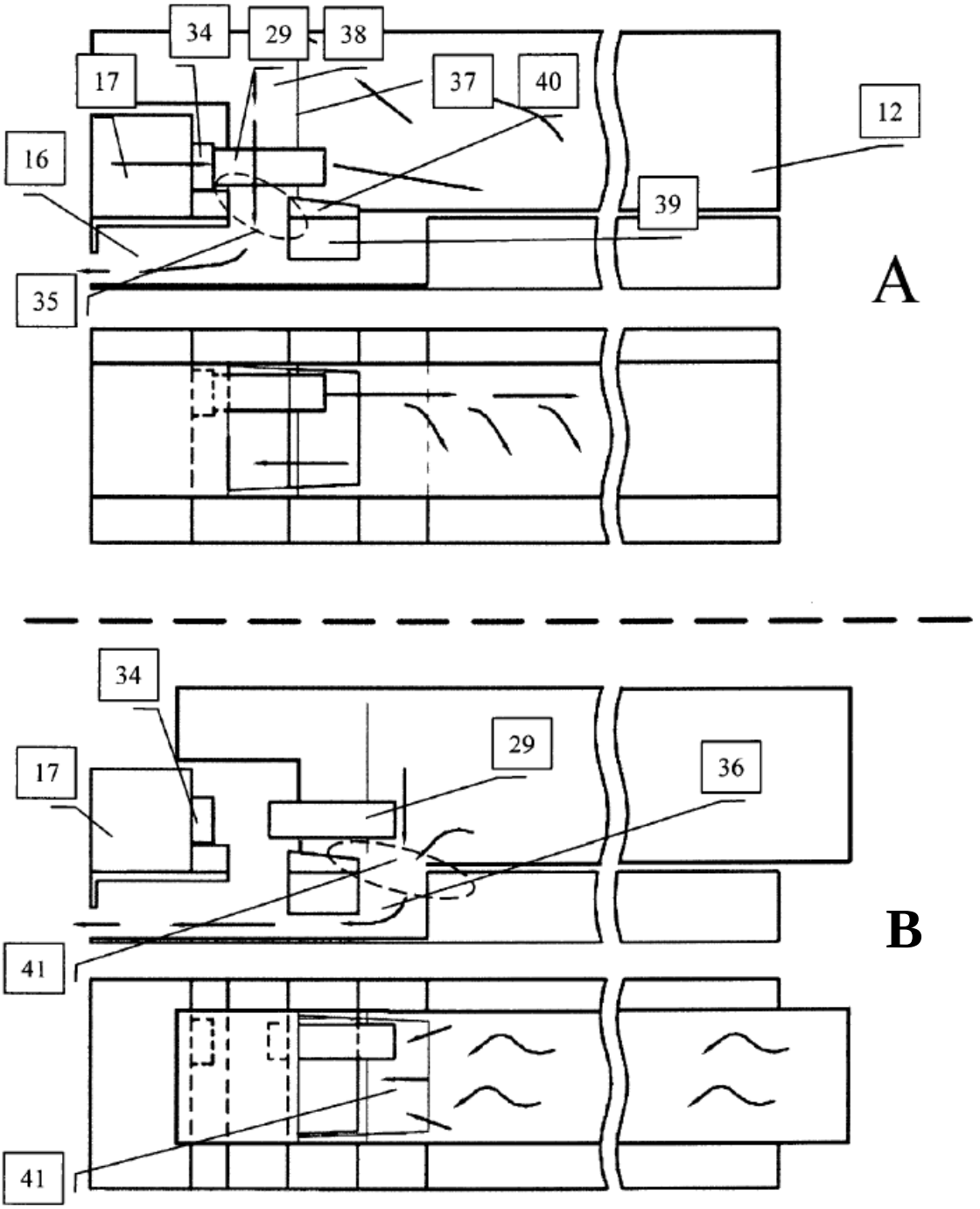

FIG. 3

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RU 2500013 C1

(54) LIQUID-COOLING SYSTEM FOR ELECTRONIC DEVICES

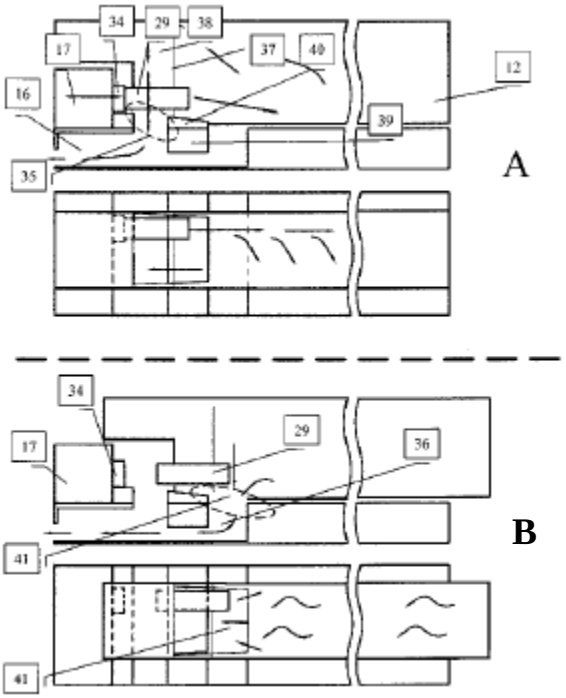
(57) Abstract:

FIELD: information technology.

SUBSTANCE: in a liquid-cooling system for cooling multiple electronic devices, each container further includes a device for fast removal (discharging) of liquid coolant from the container, wherein the device for fast removal of liquid coolant has at least a drainage hole which is sealed during normal operation of the device and open at the initial phase of removing the container with the electronic device from the support, and said drainage hole is made on the container and is provided with a seal, and the cover of the drainage hole is rigidly attached to the support such that when mounting the electronic device with the container on the support, the drainage hole on the container is sealed.

EFFECT: high efficiency of maintaining complex electronic devices.

4 cl, 14 dwg



RU 2500013 C1

FIG. 3

The claimed technical solution relates to cooling systems and, in particular, to liquid-cooling systems for cooling electronic devices.

It is known that during operation, computer equipment generates a significant amount of heat. Overheated electronic components age more rapidly. The higher the temperature of a working electronic component, the higher the likelihood of its failure. Therefore, the probability of failure of the entire electronic unit that controls the data, due to the failure of one of its constituent electronic components, increases. With the current trend of increasing the computing performance of equipment, the level of heat generation of computing components is increasing. An increase in the performance and power consumption of processors entails an increase in the power of the equipment power supplies, which leads to an increase in their heat release.

Devices for cooling electronic functional units of computing systems are known from the prior art. As a rule, they are a system of electronic units installed in a support (cabinet), each or a group of which is enclosed in a sealed container equipped with a system for supplying and removing liquid coolant, a heat exchanger for cooling the liquid, and a supercharger.

From the prior art, cooling systems using liquids are known. These are closed systems in which the cooled liquid is piped to a hot plate (radiator) in contact with the central processor or another component, and then the liquid is diverted to the heat exchanger so that it circulates in a closed loop. There are also immersion liquid systems in which the server units are immersed in containers with dielectric fluid, which is piped to heat exchangers, where it is cooled and then sent back.

A system for cooling equipment by immersion in a liquid means placing electronic components heated in the process of operation in individual sealed containers. One container may contain

- one or more computing units (a motherboard with one or more multi-core processors, memory modules and, if necessary, other expansion devices, such as graphics accelerators),
- one or several graphics accelerators,
- one or more RAID controllers,
- expansion modules of the system RAM,
- media (usually hard drives or solid state drives),
- one or more power supplies,
- switchboards, switches, wired, optical and wireless transmission devices, devices with cellular processors, measurement systems, including manual systems, etc.

The liquid cooling process can be implemented in several methods:

M. 1 – the liquid coolant is fed through the pipe to strongly heated elements with further forced draining of the liquid into the drainage system and at the same time the container is filled with coolant, thus cooling the rest of the elements (Fig. 6, 7);

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