DESCRIPTION

ELECTRONIC APPARATUS COMPRISING AUXILIARY STORAGE DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

This application is national stage application of International Application No. PCT/JP2015/079187, filed October 15, 2015, which designates the United States, incorporated herein by reference, and which claims the benefit of priority from Japanese Patent Application No. 2014-217503, filed October 24, 2014, the entire contents of which are incorporated herein by reference.

FIELD

An embodiment described herein relates generally to an electronic apparatus comprising an auxiliary storage.

BACKGROUND

An electronic apparatus comprising an auxiliary storage, for use in the industrial field of social infrastructure, has been required to have a front replaceable structure which enables replacement of the auxiliary storage from the front face of a housing of the electronic apparatus without disassembling the housing, aiming for facilitating maintenance work.

Generally, the electronic apparatus and the auxiliary storage are not firmly fixed to each other inside the housing of the electronic apparatus, so that the auxiliary storage of a front detachable structure may suffer larger vibration than applied acceleration when the electronic apparatus receives vibration from outside and collide with the auxiliary storage.

In addition, an auxiliary storage, such as a hard disk

drive (HDD), is mechanically operated, therefore, susceptible to vibration and impact. In view of this, various techniques have been developed for improving a vibration-proof performance and a shock resistant performance of the electronic apparatus.

For example, a known vibration-proof structure of the electronic apparatus including such a front replaceable auxiliary storage is such that the auxiliary storage and a tray as a mount for the auxiliary storage are integrally fixed to each other, the tray is inserted from an opening in the front face of a housing, and fixed to a frame on the rear face of the housing and to the front face of the housing with long knurled-head screws (see Patent Literature 1, for example).

Another vibration-proof structure of an electronic apparatus including a detachable auxiliary storage in the housing of the electronic apparatus includes a holder on which the auxiliary storage is mounted, and a vibration damping means between the auxiliary storage and the holder. In the vibration-proof structure, when joining a connector of the housing or a connector of the holder, one of them is attached to the other in a floating state so as to be displaceable (see Patent Literature 2, for example).

CITATION LIST

Patent Literature

Patent Literature 1: Japanese Patent Application Laid-open No. 2013-77343

Patent Literature 2: Japanese Patent No. 4116322

SUMMARY OF THE INVENTION

Problem to be Solved by the Invention

However, the front replaceable structure disclosed in

Patent Literature 1 is a complex detachable structure since the front face of the tray on which the auxiliary storage is mounted is fixed to the front face of the housing and the rear of the tray is fixed inside the housing with screws.

Although the vibration-proof structure of the electronic apparatus disclosed in Patent Literature 2 is a easily detachable structure, the vibration-proof structure of the auxiliary storage (HDD unit) is complex. The auxiliary storage is supported by a large number of vibration damping means, such as a rubber material, which is a complex vibration-proof supporting structure.

In view of solving the above problems, an object of the present invention is to provide an electronic apparatus comprising an auxiliary storage easily detachable from the front face of a housing of the electronic apparatus, and an easily settable vibration-proof structure.

Means for Solving Problem

According to one embodiment, an electronic apparatus comprises an auxiliary storage detachably attached to a housing, the electronic apparatus comprises a tray in which the auxiliary storage is fixed; a compartment including a guide rail to guide the tray inserted from an opening in a front face of the housing of the electronic apparatus, to house the auxiliary storage in the electronic apparatus; a pair of first movable plates horizontally rotatably supported by a rotational shaft at top of both rear corner ends of the compartment; and a connector attachment plate provided to a rear side face of the compartment, the connector attachment plate including a second connector connectable to a first connector provided to the auxiliary storage, wherein the first movable plate has a first

rotational face and a second rotational face disposed at a right angle to follow an outer face of a perpendicular rear corner end of the tray, for connecting the first connector and the second connector to each other when the tray is inserted from the front face of the compartment to a fixed position in the opening, a rear end of the tray presses and rotates the first rotational face, and a vibration impact absorption

a connector attachment plate disposed to be displaceable on a rear side face of the compartment, wherein

one of the pair of the movable plates having a shape to have a perpendicular rotational face about a rotational shaft to follow an outer face of a perpendicular rear corner end of the tray,

the tray is inserted from the front face of the compartment to press and rotate, at the rear end, one rotational face of the first movable plates,

a connector fixed on the rear side face of the auxiliary storage tray is connected to a connector provided to the connector attachment plate when the tray is fixed in the opening of the front face of the housing of electronic apparatus,

positions of the tray and the pair of connectors provided to the tray and the compartment, and the shape of the first movable plates are set in advance so that both rear corner ends of the tray press one rotational face of the pair of first movable plates and concurrently, a vibration impact absorption member attached to the other rotational face presses the side face of the tray, and

the tray can be attached to and detached from the front face of the electronic apparatus for easy maintenance of the auxiliary storage, and selecting the vibration impact absorption member makes it easier to set the damping of impact and vibration applied to the auxiliary storage through the housing of the electronic apparatus.

Structure 2

The vibration-proof structure of the electronic apparatus comprising the auxiliary storage according to

supported by rotational shafts at top and bottom of both rear ends of the compartment, wherein

an upper one of the second movable plate pair has a third rotational face and a fourth rotational face disposed at a right angle to follow an outer face of a perpendicular top part of a rear central area of the auxiliary storage,

a lower one of the second movable plate pair has a fifth rotational face and a sixth rotational face disposed at a right angle to follow a perpendicular outer face of a rear corner end of a bottom of the tray,

for connecting the first connector and the second connector to each other when the tray is inserted from the front face of the compartment to a fixed position in the opening, the rear end of the auxiliary storage presses and rotates the third rotational face, and a vibration impact absorption member attached to the fourth rotational face presses a top face of the auxiliary storage, the fourth rotational face rotating with the third rotational face, and

a rear bottom end of the tray presses and rotates the fifth rotational face, and a vibration impact absorption member attached to the sixth rotational face presses a bottom face of a bottom plate of the tray, the sixth rotational face rotating with the fifth rotational face.

3. The electronic apparatus comprising the auxiliary storage according to claim 2, wherein

at least one of the first movable plate pair and the second movable plate pair includes a position sensor configured to detect an attachment of the tray, and

the electronic apparatus comprises a display configured to display a state of the attachment of the tray.