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A Shockproof Protection Device for Computer Mobile Hard Disk for Information Security

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Abstract

In this paper, the problem of how to protect the mobile hard disk has made an overall design. For the mobile hard disk is easy to be damaged by external force, focusing on the design of a device that can offset the external force acting on the mobile hard disk to the mobile hard disk damage through cushioning and shock absorption.This paper mainly for the mobile hard disk data security escort, facilitate the storage of mobile hard disk needs to provide a feasible scheme.

Keywords

Computer Hard Disk; Shock Protection Device; Place Box; Data Protection.

1. Introduction

A hard disk is a delicate device. The distance between the magnetic head and the hard disk is several microns. If the magnetic head is impacted by external forces, the hard disk will be damaged. For people who store important data on hard drives, hard drive damage is less important than data loss. Therefore, it is of great significance to study the shockproof protection device of computer mobile hard disk for information security.

2. Development Status at Home and Abroad

When the hard disk is working, its own motor will cause vibration, so in order to eliminate the vibration of its own motor, there is a certain design in the hard disk. But this function is not for the hard disk shockproof, now some mobile hard disk boxes may have some shockproof function, but this box is not convenient to install and use, so it can not be popular. So the current computer mobile hard disk shock protection device research direction mainly has the following aspects[1-2]:

(1) Removable hard disk shockproof box

For example, there are short springs connected at the four wire holes of the box to start the shockproof function. These can only be simple to protect the hard disk.

(2) A buffer on the side of a removable hard drive

Now there are some mobile hard disk brands do not do side shock treatment, this is more dangerous.

(3) Move the cushioning material in the hard drive

The use of silica gel buffer material is very adverse to the mobile hard disk, such as a lot of silica gel long-term heat work, will volatilize the hard disk plate coating adverse gas. Rubber is more commonly used now.

(4) Shell material of the removable hard disk

There are not many mobile hard drives made of metal, most of which are made of plastic. Obviously, the metal material is better, and the shockproof effect is even better.

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3. Research Significance

There are boxes or sets for removable hard disk protection, but generally a box or set is dedicated to a certain removable hard disk[3],These boxes or sets only serve to wrap the mobile hard disk, slow down the impact of external forces on the hard disk, or avoid the mobile hard disk being scratched in the process of movement, the device provides a mobile hard disk protection device for information security, used to solve the existing defects in the existing hard disk protection device.

The structure design of the device is reasonable, easy to use, and in the process of placing, it is enough to replace the shock absorption of the mobile hard disk, to avoid the collision and scratch of the hard disk in the process of moving, to prevent the hard disk damage, damage or data loss, to protect the mobile hard disk, improve security.

4. Research Content and Innovation

Mobile hard disk as a precision equipment, once broken, it will cost a lot of repair costs, more afraid of the important data stored in the hard disk damage, so as to produce irreparable consequences. The most effective way to protect the mobile hard disk is to design the mobile hard disk shockproof protection device, and strive to do a good job in the anti-fall, anti-shock and other aspects of the mobile hard disk shockproof protection[4].

(1) The device is realized through the following technical scheme

Information security with a computer mobile hard disk shock protection, including place box, placed at the top of the box on the left side of the articulated lifted the lid, lifted the lid on the surface of the roof in the middle of an arc groove, through groove with cross section for the inverted u-shaped handle in hand in the middle of the open hole, lifted the lid on one side of the fixed installation of the vertical rod, and make the plug rod can be inserted into the hole, Handle bottom fixed respectively connect one end of the elastic rope, elastic rope at the other end respectively fixed at the top of the connecting rod, connecting rod bearing respectively installed on both sides before and after the lid in the middle, tie rod bottom and top of the connecting rod hinged connection, respectively hinged on both ends of the connecting rod before and after the installation of vertical pole, which located in the corresponding stem rod lateral and vertical stem bottom joint fixed clamp, clamp, located within the lid, The bottom surface of the pressing plate is fixed with a protective layer, and the left and right sides of the pressing plate are respectively fixed with a semicircular insert block; The left and right sides of the placement box are respectively provided with spherical slots, insert blocks can be inserted into the corresponding slot, the top front and rear sides of the pressure plate are respectively provided with a t-shaped cross groove, cross groove are respectively provided with a t-shaped slider, the slider can move along the corresponding cross groove, the top surface of the slider is hinged with the corresponding vertical rod bottom surface; Placed in the box with the placement of horizontal plate, the top surface of the fixed place plate installed protective layer and placed box, placed several elastic block box of the lining of the fixed installation, placed inside the box are opening guide groove on both sides, place the plate are fixed on both sides of the installation guide bar, both before and after the opening at the top of the guide bar spherical tank, the spherical tank with ball, ball can roll on the spherical tank, The ball can contact the top surface of the guide groove and move along the guide groove, and one end of the guide rod is located in the guide groove and can move along the guide groove; A number of cylinders are fixed on the bottom of the placing box, and the piston is provided with a piston inside the cylinder. The piston can move up and down in the cylinder. The piston rod is fixed on the top surface of the piston rod, the piston rod sleeve spring, the upper end of the piston rod is fixedly connected with the bottom of the placing plate, and the lower end of the piston rod runs through the upper end of the cylinder.

(2) Use of device

When using the device, the mobile hard disk is placed on the placement plate in the placement box, the box cover is closed, the handle is moved upward from the trough, the handle moves to move the

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elastic rope outward, the elastic rope moves to move the pull rod clockwise, the pull rod moves to move the connecting rod, and the connecting rod moves to move the vertical rod counterclockwise. Vertical pole rotates, the slider along the horizontal trough to the right until the stem is in the vertical position, the pressure plate placed into the box, linking piece on the insert block inserted into the corresponding slot, linking piece come in contact with the top surface of mobile hard disk, thus to fix the position of the mobile hard disk, in the mobile device, move up and down through the piston within the cylinder to drive the piston rod moves up and down, The piston rod drives the mobile hard disk to move up and down through the placing plate, while the pressing plate is closely connected with the box cover and the placing box, and the box cover will not be opened randomly in the process of moving; When opening the box cover, put the handle back into the trough, the elastic rope is in a relaxed state, the pull rod rotates counterclockwise, while the vertical rod rotates clockwise, and the slider moves to the left along the horizontal groove, making the pressure plate back into the box cover.

(3) Simulation Experiment

ANSYS simulation was used to verify the feasibility and effectiveness of the above technical scheme, and analyze the influence degree and action rule of friction, connectivity and other factors on the simulation results. The structure of the device is shown in Figure 1 and Figure 2.

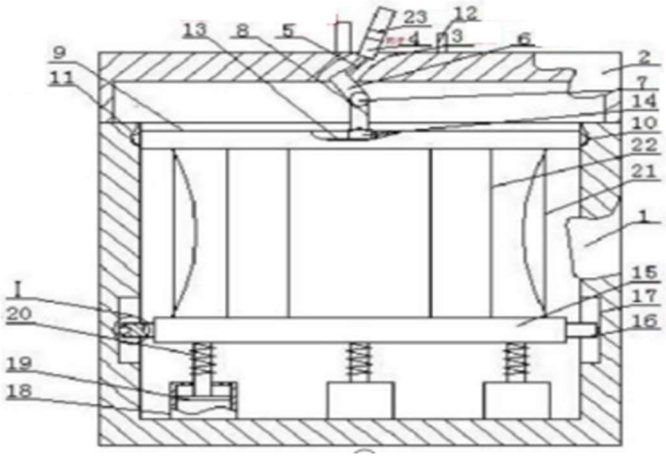

Figure 1. Assembly drawing of the device

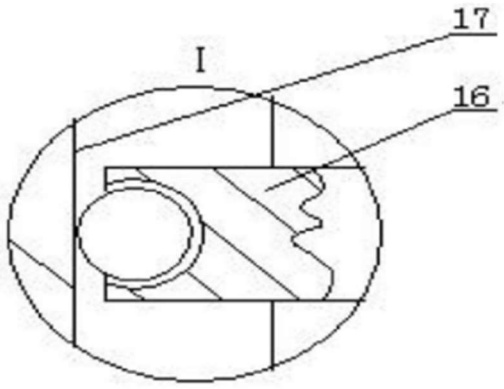

Figure 2. Section diagram of plate placement

(4) Innovation point

1) U-shaped handle design, easy to move the device;

2) The bottom surface of the pressing plate and the top surface of the placing plate are fixed with a protective layer, which greatly improves the protection ability of the device;

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3) The top surface of the placement plate is fixed with a placement box, which is conducive to the placement of the mobile hard disk; The inner wall of the placement box is fixed with several elastic blocks, which play a certain role in cushioning and damping.

5. Research Method

In the process of research, this paper USES the data collection, literature review and arrange, methods of investigation and study, integrated use of multidisciplinary knowledge, such as engineering mechanics, engineering structure, etc., establish initial shock shock result data protection model and design algorithm, the optimal assessment using mathematics software, the analysis and evaluation the effects of various factors on shock results, In order to establish the best computer mobile hard disk shockproof protection device.

6. Feasibility Analysis of the Study

(1) Social feasibility

Hard drives have a price. Data is priceless. Most of the time the mobile hard disk in the process of moving easy to damage, but often stored in the important data content, the device structure is reasonable design, easy to use, and placed in the process of the mobile hard disk can be shock absorption, to avoid the hard disk in the process of moving by collision and scratch, to prevent the mobile hard disk damage or data loss.

(2) Technical feasibility

Most of the members of the research team are members of mathematical modeling competition and have the ability to build models and design algorithms.

7. Conclusion

The purpose of this paper is to take convenience and practicability as the principle, and to comprehensively consider the portability, shockproof, easy placement of the removable hard disk protection device as the goal, and analyze the mechanism of the product related influencing factors, to provide theoretical support for the design of the removable hard disk shockproof protection device. Key issues to be solved:

(1) Easy to move

Improve the existing mobile hard disk protection device, through the handle to make the device more convenient to move.

(2) Protective effect

Through the protective layer and spring device, the mobile hard disk in the process of use for cushioning shock absorption, improve the practicality of the device.

(3) Easy to place

A placement box is fixed on the top surface of the placement plate, and a number of elastic blocks are fixed on the inner wall of the placement box. Easy to place the removable hard disk, and through the elastic block can also play a role of shock absorption.

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