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(54) **HARD DISK DRIVE DRAWER**

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(57) **ABSTRACT**

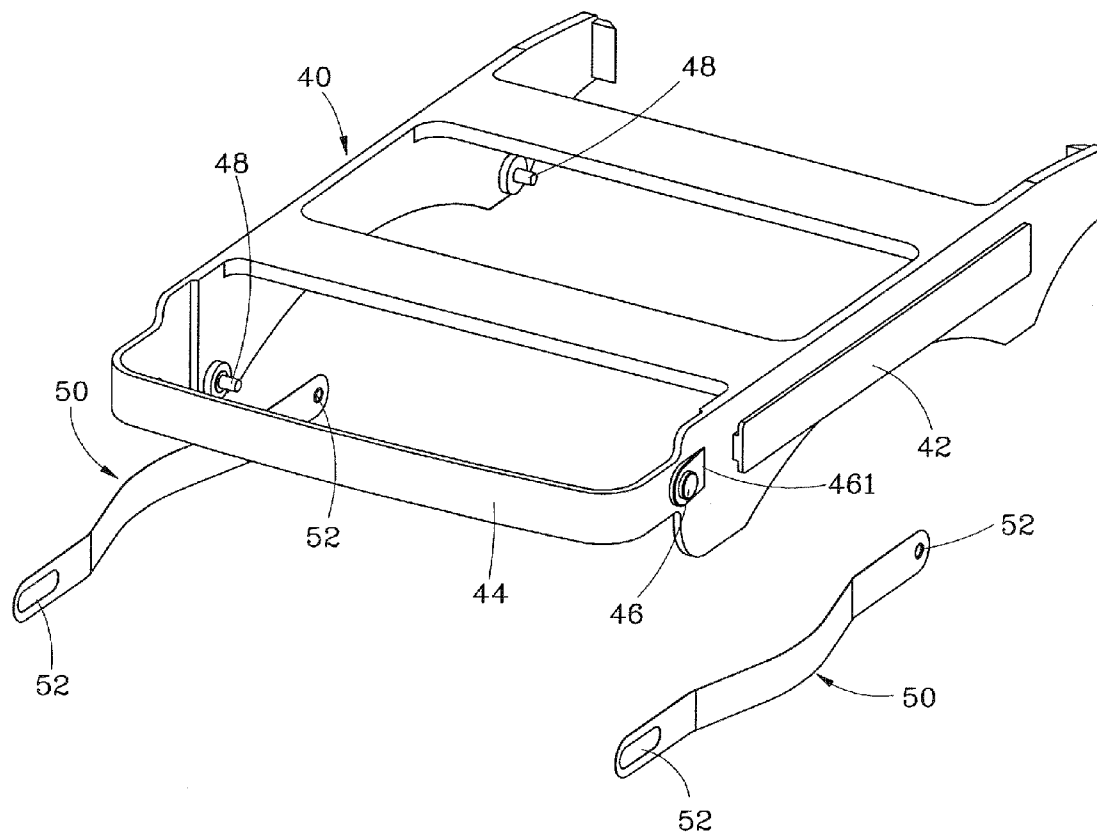
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A hard disk drive drawer includes a fixed casing mountable inside a computer housing, and a drawable carrier moveably and detachably receivable in the fixed casing. The fixed casing having two opposite lateral panels, each of which is provided with a track and a retaining portion located at the track adjacent to a free end of the track. The drawable carrier is elastically deformable for holding a hard disk drive therein. The drawable carrier has two sliding rails disposed at two opposite lateral sidewalls thereof and detachably, slidably and respectively coupled to the tracks, a handle at one side thereof, and two positioning portions engageable with the retaining portions of the fixed casing.

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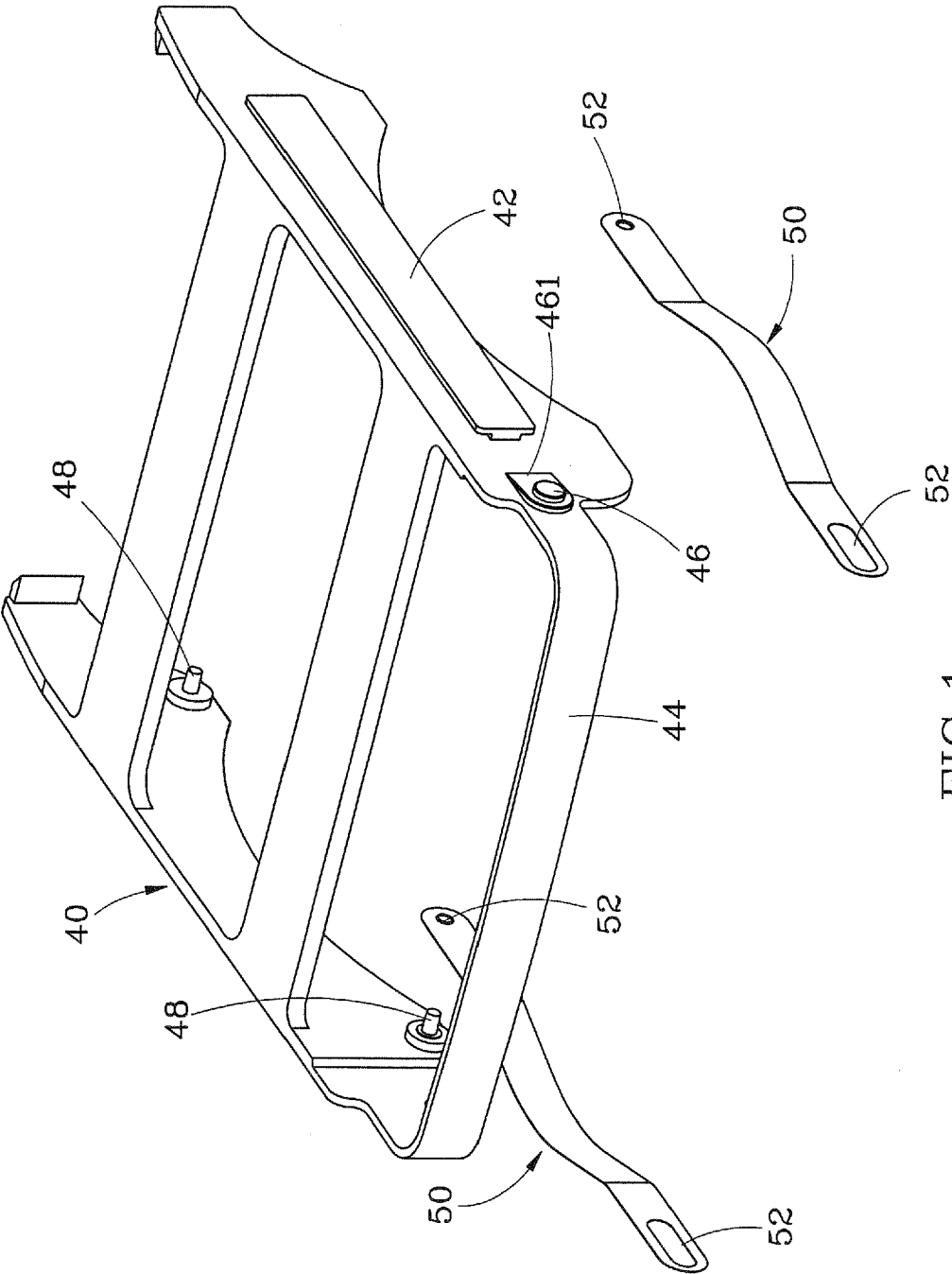


FIG.1

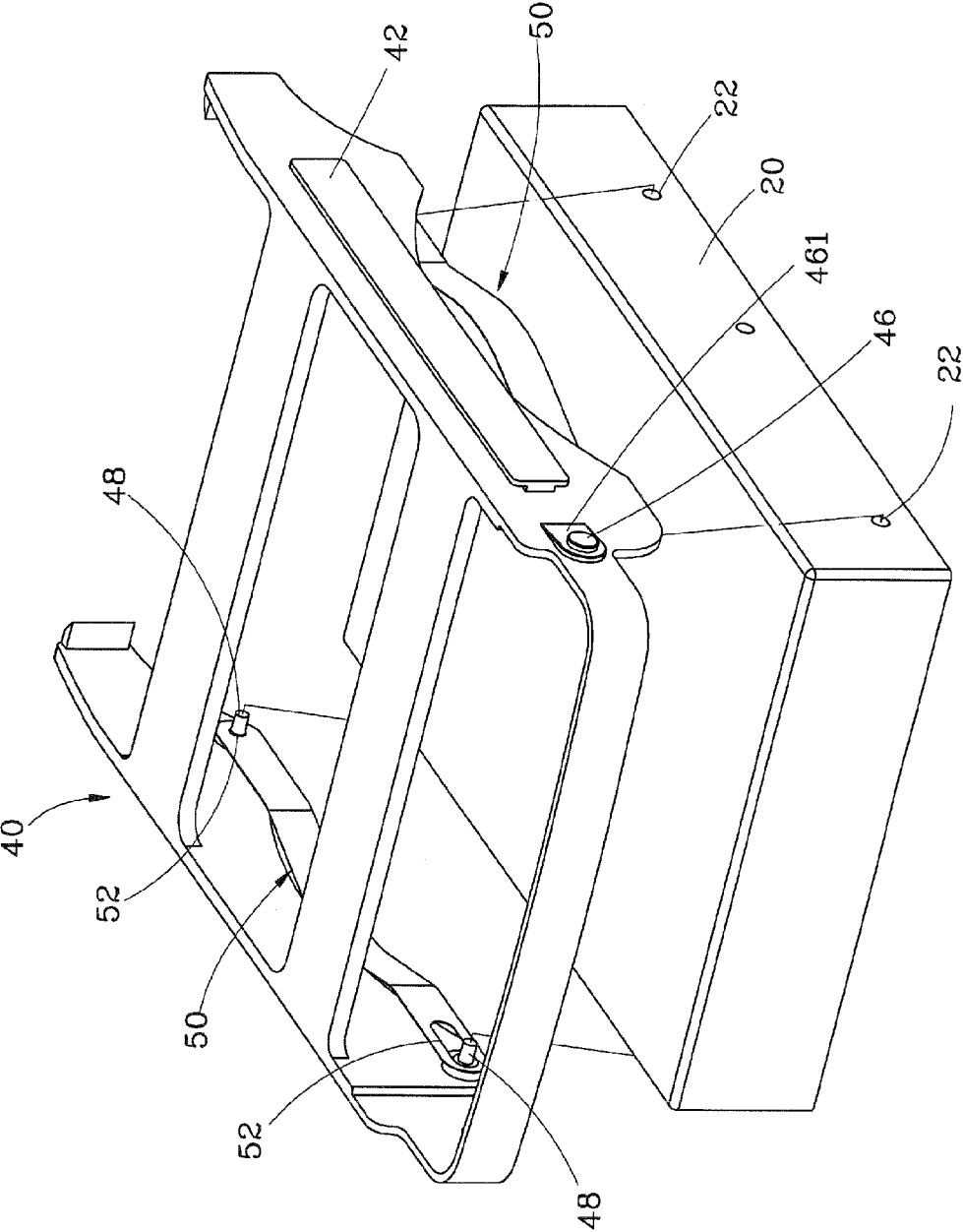


FIG. 2

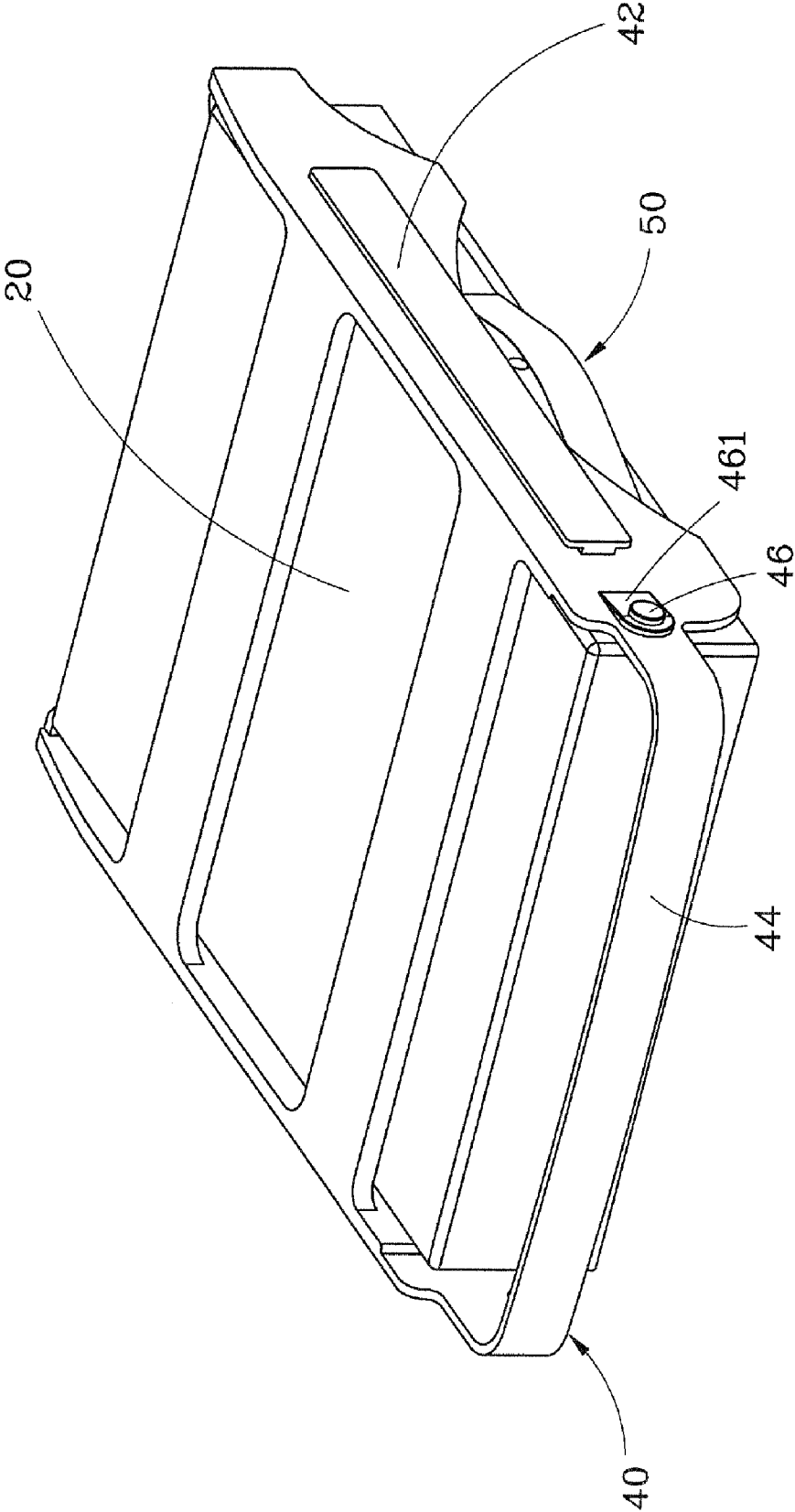


FIG. 3

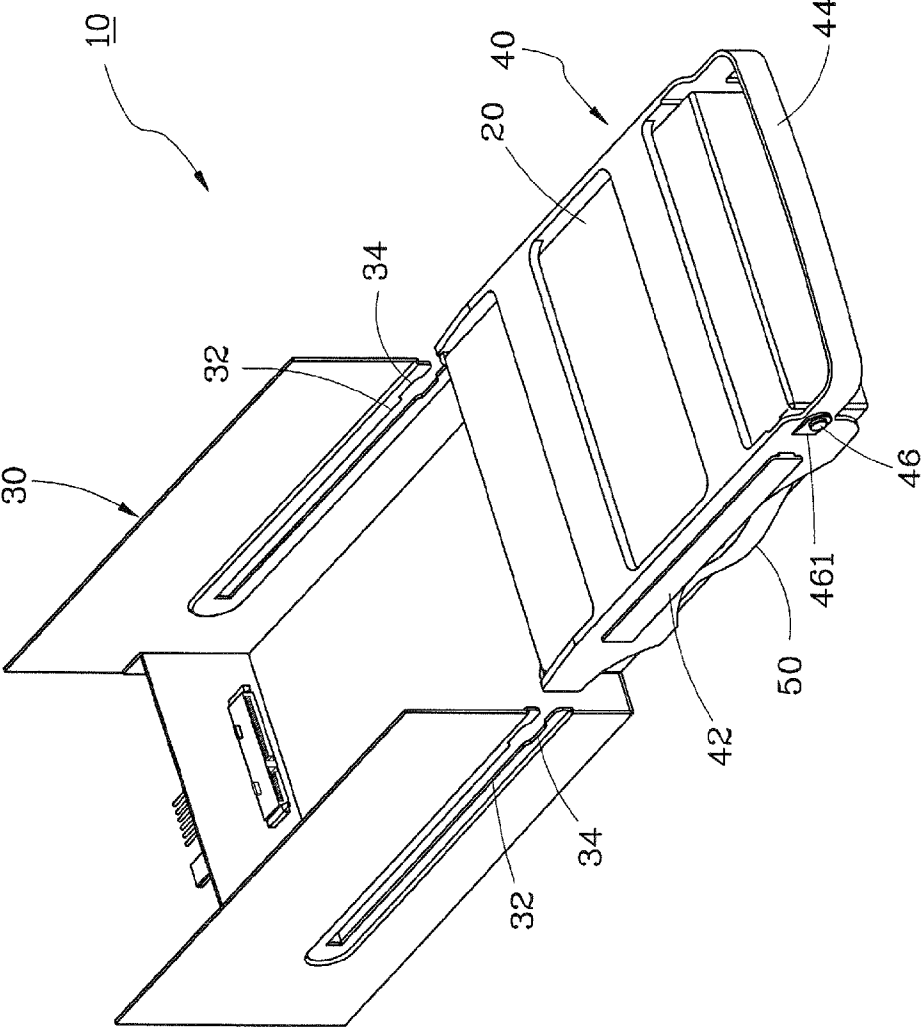


FIG. 4

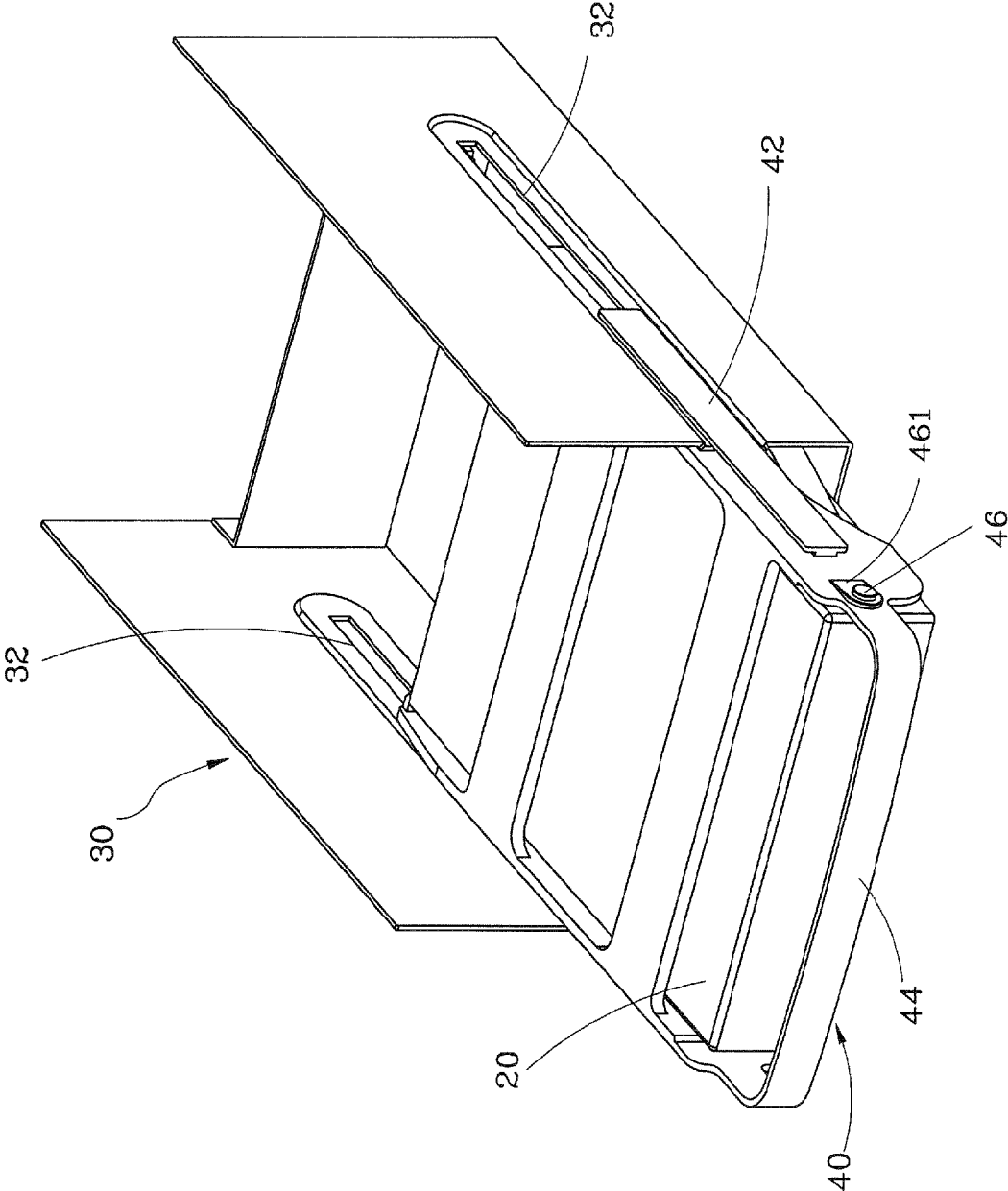


FIG. 5

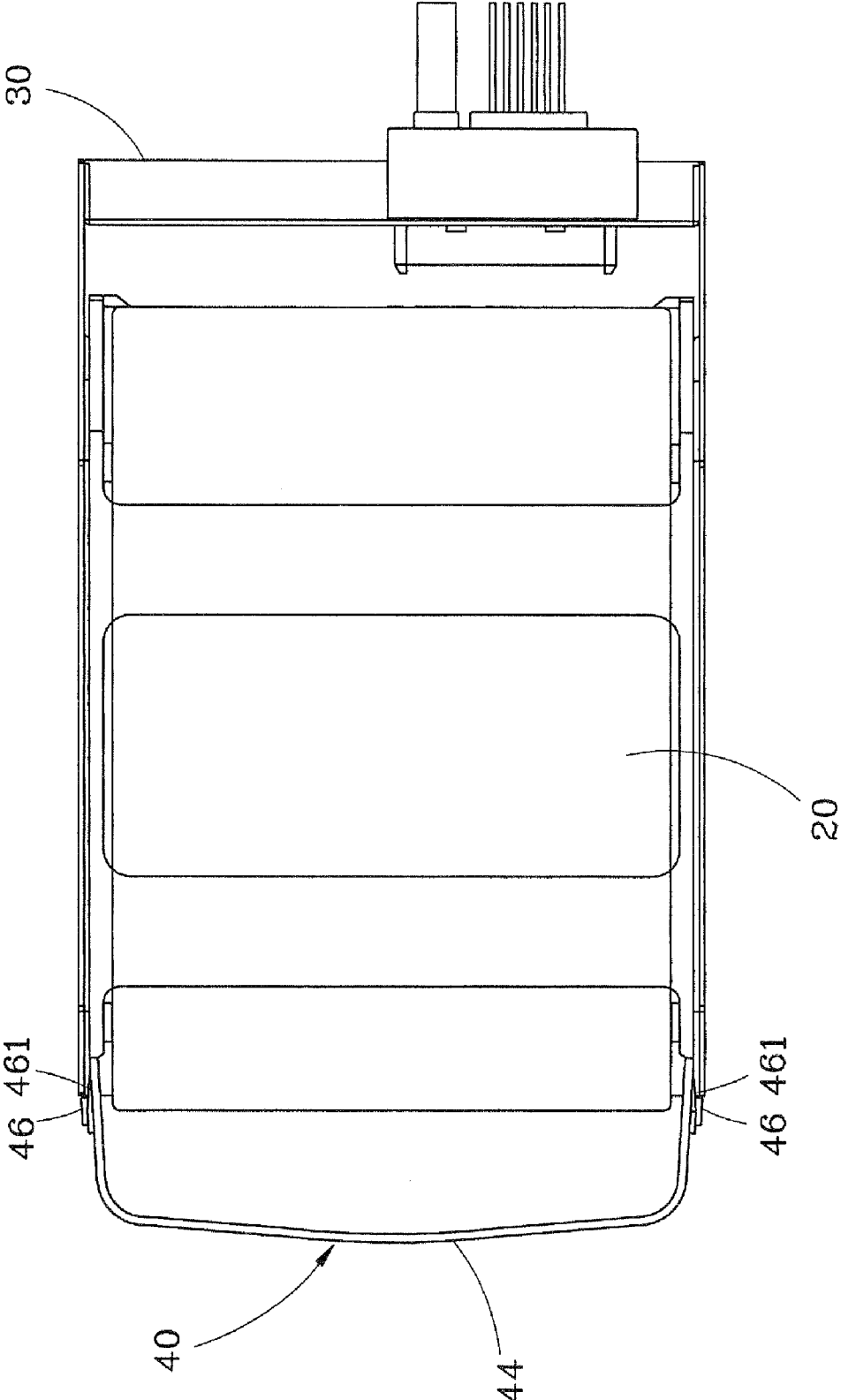


FIG. 6

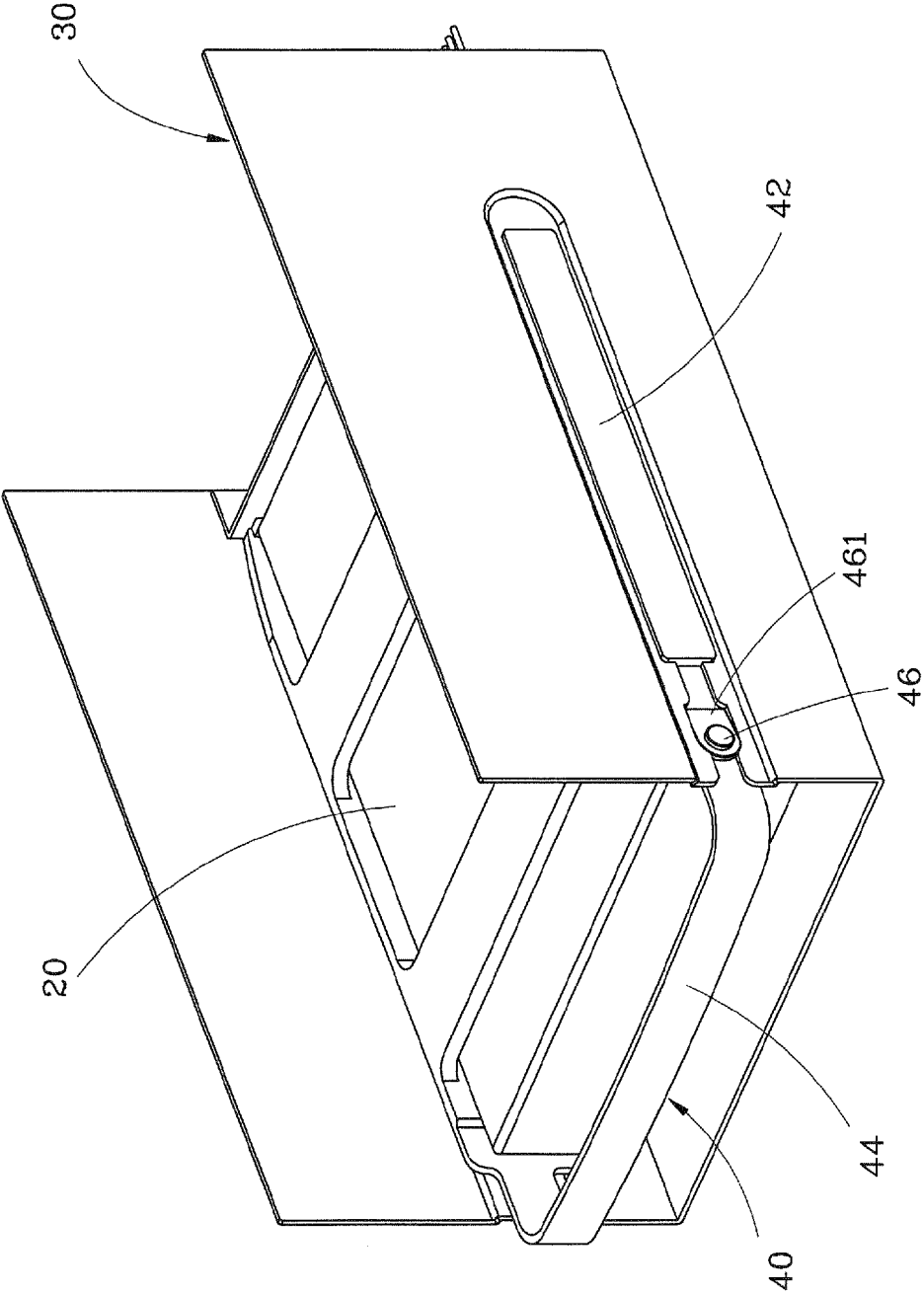


FIG. 7



**HARD DISK DRIVE DRAWER**

**BACKGROUND OF THE INVENTION**

**[0001]** 1. Field of the Invention

**[0002]** The present invention relates generally to computer hard disk drives and more specifically, to a hard disk drive drawer including a fixed casing adapted to be fixed inside a computer housing and a drawable carrier, which is moveably receivable in the fixed casing, for holding the hard disk drive therein.

**[0003]** 2. Description of the Related Art

**[0004]** A conventional hard disk drive drawer generally comprises an outer frame member and an inner frame member. The inner frame member is adapted to hold a hard disk drive and is moveably receivable in the outer frame member for enabling insertion and withdrawal of the hard disk drive into/out of the outer frame member. By means of withdrawal and exchange of the inner frame member, the user can quickly replace a hard disk drive.

**[0005]** According to the aforesaid design, the user must install the outer frame member in the computer housing and fasten the hard disk drive in the inner frame member by means of screws and screwdriver, thereby requiring much time in installation. Further, this structure does not provide a grounding arrangement to protect the hard disk drive against possible electrostatic discharge (hereinafter referred to as "ESD") damage. Therefore, the hard disk drive is not free from the risk of ESD damage.

**SUMMARY OF THE INVENTION**

**[0006]** The present invention has been accomplished under the circumstances in view. It is therefore one objective of the present invention to provide a hard disk drive drawer, which is easy to install and to operate, and convenient in use.

**[0007]** It is another objective of the present invention to provide a hard disk drive drawer, which can be well grounded for preventing the hard disk drive installed therein from ESD damage.

**[0008]** To achieve these objectives of the present invention, the hard disk drive drawer provided by the present invention comprises a fixed casing mountable inside a computer housing, and a drawable carrier moveably and detachably receivable in the fixed casing. The fixed casing has two opposite lateral panels, each of which is provided with a track and a retaining portion located at the track adjacent to a free end of the track. The drawable carrier is elastically deformable for holding a hard disk drive therein. The drawable carrier has two sliding rails disposed at two opposite lateral sidewalls thereof and detachably, slidably and respectively coupled to the tracks, a handle at one side thereof, and two positioning portions engageable with the retaining portions of the fixed casing for securing the drawable carrier to the fixed casing.

**[0009]** The hard disk drive drawer can farther includes at least one spring strip mounted in the drawable carrier and closely attachable between the fixed casing that is grounded with the computer housing and the hard disk drive carried in the drawable carrier, such that the hard disk drive can be grounded so as to prevent the hard disk drive from ESD damage.

**[0010]** The hard disk drive drawer provided by the invention utilizes the elastically deformable characteristic of the drawable carrier for easy and quick installation of the hard disk drive, and the at least one spring strip acts as a bridge

connecting the hard disk drive carried in the drawable carrier and the grounded fixed casing, thereby providing the hard disk drive a protection against ESD damage.

**[0011]** Further scope of applicability of the present invention will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

**BRIEF DESCRIPTION OF THE DRAWINGS**

**[0012]** The present invention will become more fully understood from the detailed description given herein below and the accompanying drawings which are given by way of illustration only, and thus are not limitative of the present invention, and wherein:

**[0013]** FIG. 1 is an exploded view of a part of a hard disk drive drawer according to an exemplary embodiment of the present invention, showing the structure of the drawable carrier and the spring strips;

**[0014]** FIG. 2 is a perspective view showing that the spring strips are fastened to the drawable carrier before installation of a hard disk drive in the drawable carrier;

**[0015]** FIG. 3 is a perspective assembly view showing that the hard disk drive is installed in the drawable carrier;

**[0016]** FIG. 4 is an exploded view of the hard disk drive drawer according to the exemplary embodiment of the present invention, in which the hard disk drive is installed in the drawable carrier;

**[0017]** FIG. 5 is a schematic view of the exemplary embodiment of the present invention, showing the sliding rails of the drawable carrier coupled to the tracks of the fixed casing;

**[0018]** FIG. 6 is a schematic top view of the exemplary embodiment of the present invention, showing the drawable carrier deformed during installation; and

**[0019]** FIG. 7 is a perspective view of the hard disk drive drawer according to the exemplary embodiment of the present invention, showing the positioning portions of the drawable carrier engaged with the retaining portions of the fixed casing.

**DETAILED DESCRIPTION OF THE INVENTION**

**[0020]** Referring to FIGS. 1-7, a hard disk drive drawer 10 in accordance with an exemplary embodiment of the present invention is adapted to be fixed inside a computer housing (not shown) for holding a hard disk drive 20 therein. As shown in FIG. 2, the hard disk drive 20 has a plurality of mounting holes 22 on its two opposite lateral sides. Since the hard disk drive 20 is a memory device of a conventional design, no further detailed description in this regard is necessary. As shown in FIG. 4, the hard disk drive drawer 10 comprises a fixed casing 30, a drawable carrier 40 and two spring strips 50.

**[0021]** The fixed casing 30 is adapted to be fixed inside the computer housing (not shown) and then grounded. The fixed casing 30 includes two parallel opposite lateral panels, in each of which a track 32 and a retaining portion 34 are provided. In this embodiment, the two tracks 32 are elongated slots respectively formed in the two opposite lateral panels of the fixed casing 30 and horizontally extending to the front ends of the panels, and the two retaining portions 34 are

retaining holes respectively formed in the opposite lateral panels of the fixed casing 30 in communication with the tracks 32 and adjacent to the free ends of the tracks 32. The retaining portions 34 have a vertical width greater than that of the rails 32.

[0022] The drawable carrier 40 is an elastically deformable single-piece member, including two sliding rails 42, a handle 44, two positioning portions 46 and a plurality of pins 48. The sliding rails 42 are symmetrically disposed at outer surfaces of the two opposite lateral sidewalls of the drawable carrier 40. Each sliding rail 42 has a T-shaped cross section respectively slidably couplable to one of the tracks 32 of the fixed casing 30 and movable along the respective track 32. The handle 44 is provided at one side, namely, the front side of the drawable carrier 40 for holding by the user to insert and withdraw the drawable carrier 40 into/out of the fixed casing 30. The positioning portions 46 are protruding blocks in this embodiment, which are respectively disposed between the handle 44 and the sliding rails 42 and engageable with the retaining portions 34 of the fixed casing 30. The positioning portions 46 each have a sloping surface 461 downwardly sloping toward the associated sliding rail 42. The pins 48 are used to be inserted into the mounting holes 22 of the hard disk drive 20 to secure the hard disk drive 20 to the drawable carrier 40.

[0023] The two spring strips 50 are elongated, elastically deformable metal strips, each having smoothly arched middle part and a plurality of through holes 52 for coupling to the pins 48 to secure the spring strips 50 to the drawable carrier 40. When the drawable carrier 40 is inserted inside the fixed casing 30, the spring strips 50 are closely stopped between the fixed casing 40 that is grounded and the hard disk drive 20, that is held inside the drawable carrier 30, such that the hard disk drive 20 is grounded.

[0024] When fastening the hard disk drive 20 to the drawable carrier 40, pull the two opposite lateral sidewalls of the drawable carrier 40 outwards in reversed direction, and then cap the drawable carrier 40 on the hard disk drive 20 to force the respective pins 48 of the drawable carrier 40 into the respective mounting holes 22 of the hard disk drive 20, and then release the hand from the drawable carrier 40 for allowing the drawable carrier 40 to return to its former shape by means of its elastically deformable material property. Thus, the hard disk drive 20 is fastened to the drawable carrier 40, as shown in FIG. 3.

[0025] When using the hard disk drive 20, insert the sliding rails 42 of the drawable carrier 40 into the tracks 32 of the fixed casing 30 respectively, and then apply a forward pressure to the handle 44 to push the drawable carrier 40 toward the inside of the fixed casing 30 and to simultaneously move the sliding rails 42 along the tracks 32. When about one half of the drawable carrier 40 is pushed into the inside of the fixed casing 30, as shown in FIG. 5, the spring strips 50 are squeezed by the inner surfaces of the opposite lateral panels of the fixed casing 30 to deform and held closely attached to the hard disk drive 20 and the fixed casing 30, and therefore the hard disk drive 20 held by the drawable carrier 40 is grounded by means of the grounded fixed casing 30. When continuously pushing the drawable carrier 40 toward the inside of the fixed casing 30, the sloping surfaces 461 of the positioning portions 46 are forced against the inner surfaces of the opposite lateral panels of the fixed casing 30, thereby

causing the drawable carrier 40 to be squeezed and deformed, as shown in FIG. 6. At this time, the drawable carrier 40 is continuously moved forwards subject to the applied force. As soon as the positioning portions 46 are forced into the respective retaining portions 34, the drawable carrier 40 is stopped from forward movement, and the installation of the drawable carrier 40 in the fixed casing 30 is done, as shown in FIG. 7. When wishing to remove the hard disk drive 20, reverse the aforesaid procedure.

[0026] As stated above, the invention utilizes the elastically deformable characteristic of the drawable carrier 40 for easy installation of the hard disk drive 20 in the drawable carrier 40 and for easy installation of the drawable carrier 40 in the fixed casing 30 without any tools or fastener such as screws. Therefore, the installation procedure is simple and convenient. Further, by means of the connection of the spring strips 50 between the hard disk drive 20 and the grounded fixed casing 30, the hard disk drive 20 can be well grounded to prevent itself from damage due to ESD phenomenon.

[0027] In general, the invention provides a hard disk drive drawer, which utilizes the elastically deformable characteristic of the drawable carrier for easy and quick installation of the hard disk drive and the connection arrangement of two spring strips to preventing the hard disk drive held by the drawable carrier from ESD damage.

[0028] The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

What is claimed is:

1. A hard disk drive drawer mountable inside a computer housing for holding a hard disk drive therein, the hard disk driver drawer comprising:

a fixed casing mountable inside the computer housing, the fixed casing having two opposite lateral panels, each of which has a track, and a retaining portion formed in at least one of the two opposite lateral panels and located adjacent to a free end of one of the tracks; and

a drawable carrier elastically deformable for holding the hard disk drive therein, the drawable carrier having two sliding rails disposed at two opposite lateral sidewalls thereof and detachably, slidably and respectively coupled to the tracks, a handle at one side thereof, and a positioning portion engageable with the retaining portion of the fixed casing.

2. The hard disk drive drawer as claimed in claim 1, wherein the tracks of the fixed casing are elongated slots; the sliding rails of the drawable carrier have a T-shaped cross section for coupling to the elongated slots.

3. The hard disk drive drawer as claimed in claim 1, wherein the retaining portion is a locating hole having a width greater than the width of the tracks.

4. The hard disk drive drawer as claimed in claim 1, wherein the fixed casing includes two said retaining portions, which are respectively formed in the two opposite lateral panels of the fixed casing and at the two tracks.

5. The hard disk drive drawer as claimed in claim 1, wherein the positioning portion of the drawable carrier includes a protruding block having a sloping surface.

6. The hard disk drive drawer as claimed in claim 1, wherein the drawable carrier comprises a plurality of pins disposed at inner surfaces of the two opposite sidewalls for insertion into mounting holes of the hard disk drive.

7. The hard disk drive drawer as claimed in claim 1, wherein the drawable carrier is a single-piece member.

8. The hard disk drive drawer as claimed in claim 1, further comprising at least one spring strip mounted in the drawable carrier and closely attached to the fixed casing.

9. The hard disk drive drawer as claimed in claim 8, wherein the spring strip is elastically deformable.

10. The hard disk drive drawer as claimed in claim 8, wherein the spring strip has a smoothly arched middle part.

11. The hard disk drive drawer as claimed in claim 8, wherein the drawable carrier comprises a plurality of pins; the spring strip has a plurality of through holes for insertion of the pins of the drawable carrier.

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