Engaging structure for closet drawer

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Abstract
An engaging structure of the drawer of a closet includes a fixing element on any one of the two opposite sides of the drawer that have sliding rails. One end of the fixing element is provided with a first guiding part corresponding to the end edge of the lift handle disposed on the front side of the drawer. The other end of the fixing element has an engaging part to engage with a stopping part when the drawer is put into the closet. To pull or push the drawer out of or into the closet, the user uses the lift handle to control the engagement or departure between the engaging part and the stopping part.
ENGAGING STRUCTURE FOR CLOSET DRAWER

BACKGROUND OF THE INVENTION

[0001] 1. Field of Invention
[0002] The invention relates to an engaging structure of the drawer of a closet and, in particular, to an engaging structure that controls the positioning or departure of a drawer in or out of the closet.
[0003] 2. Related Art
[0004] FIG. 9 shows an opening/closing structure of a conventional drawer. The front wall 41 of the drawer 4 is provided with a pulling element 42. The pulling element 42 connects to a lift handle 43 in the drawer 4. The lift handle 43 is pivotally connected to one sidewall of the drawer 4. The other end of the lift handle 43 has an engaging part 431. Inside the closet 5 there is a corresponding stop hole 51 for the engaging part 431 to engage. An elastic element 44 is disposed between the lift handle 43 and the front wall 41 of the drawer 4 for the lift handle 43 to restore its position after the drawer is pulled.

[0005] As shown in the drawing, the pulling element 42 and the lift handle 43 are represented by the solid lines in their normal states. The engaging part 431 of the lift handle 43 engages with the stop hole 51, so that the drawer 4 is closed. To open the drawer 4, as shown by the dashed lines, one simply pulls up the lift handle 42. This action displaces the engaging part 431 of the engaging element 43 pivotally downward, so that the engaging part 431 departs from the stop hole 51. The drawer 4 can thus be pulled out of the closet 5.

[0006] However, one end of the engaging element 43 connects to the elastic element 44. The other end of the elastic element is fixed to the front wall 41. Through the weight of the lift handle 42 and the restoration of the elastic element 44, the engaging element 43 engages with the stop hole 51. Therefore, when the elastic element 44 has elastic fatigue, the engaging element 43 does not urge against the stop hole 51, producing little engagement effect. Moreover, when the closet 5 is seriously shaken or topples over, the engaging element 43 is disturbed to depart from the stop hole 51. In this case, the drawer 4 easily slides out of the closet 5, endangering its user.

[0007] It is the purpose of the invention to provide a better positioning mechanism between the drawer and the closet so that the above-mentioned problem can be avoided.

SUMMARY OF THE INVENTION

[0008] An objective of the invention is to solve the above-mentioned problems by providing an engaging structure of the drawer of a closet. When the drawer is pushed into the closet, its engaging part and the stopping part inside the closet engage with each other. To pull out the drawer, one pulls the lift handle in order to push the first guiding part. The engaging part pivotally rotates to leave the stopping part. The disclosed structure provides a mechanism to position and separate the drawer.

[0009] Another objective of the invention is to enhance the positioning effect between the engaging part and the stopping part. This is achieved by providing an elastic element on one side of the connecting part at the bottom of the fixing element. This elastic element provides the effects of restoring the stopping part of the fixing element and increasing the force exerted by the stopping part on the stopping element.

[0010] Yet another objective of the invention is to make the guidance slide smoother after the lift handle is pulled. This is achieved by adding a stopping part above the first guiding part of the engaging part. Moreover, one side of the connecting part at the bottom of the fixing element has the elastic element. The end edge of the lift handle pushes against the stopping part for the elastic element to restore its position.

[0011] To achieve the above objectives, the invention includes: a lift handle and at least one fixing element. The lift handle is disposed horizontally in front of a drawer. The lift handle has a pivotal connection part to connect to the drawer. On both sides of the pivotal part, the lift handle extends downward with a lifting part and a pushing part.

[0012] A connecting part is disposed under the fixing part for a pivotal connection to the outer wall of the drawer. One end above the connecting part has a first guiding part protruding toward the lift handle, so that the bottom of the pushing part of the lift handle urges against the first guiding part. When the lift handle is lifted, the first guiding part is pushed to rotate. The other end of the first guiding part has an engaging part with a stopping end. Corresponding to the stopping end of the engaging part, the closet has a stopping element for engaging with the stopping end when the drawer is pushed into the closet.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] These and other features, aspects and advantages of the invention will become apparent by reference to the following description and accompanying drawings which are given by way of illustration only, and are thus not limiting of the invention, and wherein:

[0014] FIG. 1 is a three-dimensional schematic view of the relative position of the drawer and closet according to the invention;

[0015] FIG. 2 is a three-dimensional exploded view of the invention;

[0016] FIG. 3 is a front view of the engaging part and the stopping element in their normal positioning state according to the invention;

[0017] FIG. 4 is a front view of the engaging part and the stopping element in their action state according to the invention;

[0018] FIG. 5 is a three-dimensional schematic view of the second embodiment of the invention;

[0019] FIG. 6 is a three-dimensional exploded view of the second embodiment of the invention;

[0020] FIG. 7 is a front view of the engaging part and the stopping element in their normal positioning state according to the second embodiment;

[0021] FIG. 8 is a front view of the engaging part and the stopping element in their action state according to the second embodiment; and

[0022] FIG. 9 is a cross-sectional view of the structure of a conventional drawer.

DETAILED DESCRIPTION OF THE INVENTION

[0023] The present invention will be apparent from the following detailed description, which proceeds with reference to the accompanying drawings, wherein the same references relate to the same elements.

[0024] A first embodiment of the disclosed engaging structure for the drawer of a closet is described with reference to
The disclosed structure includes: a holder \textit{11}, a lift handle \textit{12}, and at least one fixing element \textit{3}.

[0025] The holder \textit{11} is disposed on the front side of a drawer \textit{1} for the user to hold while drawing and pushing the drawer \textit{1} into and from a closet \textit{2}. In this embodiment, the holder \textit{11} is horizontally disposed along the top edge in front of the drawer \textit{1}. Moreover, the holder \textit{11} is an arc protrusion.

[0026] The lift handle \textit{12} is also horizontally disposed in front of the drawer \textit{1}, under the holder \textit{11}. In this embodiment, the lift handle \textit{12} has a pivotal connection part \textit{121}. The top edge of the pivotal connection part \textit{121} pivotally connects with the drawer \textit{1}. The lift handle \textit{12} further has a lifting part \textit{122} and a pushing part \textit{123}. The lifting part \textit{122} connects to the outer side edge of the pivotal connection part \textit{121}, and extends obliquely downward from the pivotal connection part \textit{121}. The pushing part \textit{123} connects to the inner side edge of the pivotal part \textit{121}, and extends obliquely downward from the pivotal connection part \textit{121}.

[0027] The fixing element \textit{3} has a T shape. A connecting part \textit{31} is provided below it for a pivotal connection to any one of the opposite sides of the drawer \textit{1} that have sliding rails. The end of the fixing element \textit{3} above the connecting part \textit{31} has a first guiding part \textit{32} protruding toward the lift handle \textit{12}. The top surface of the first guiding part \textit{32} has a slide guiding surface \textit{312}, so that the bottom of the pushing part \textit{123} of the lift handle \textit{12} engages against the side guiding surface \textit{312} of the first guiding part \textit{32}. When the lift handle \textit{12} is lifted, the first guiding part \textit{32} is pushed to rotate pivotally. The other end of the fixing part \textit{3} has an engaging part \textit{33} whose end portion is extended sideways with a stopping part \textit{331}. The stopping part \textit{331} is a slant surface and has a stopping end \textit{332} on its bottom end. The closet \textit{2} has a stopping element \textit{21} corresponding to the stopping end \textit{332} of the engaging part \textit{33}. The stopping element \textit{21} and the stopping end \textit{332} engage with each other.

[0028] Please refer to FIGS. 3 and 4 for the application of this embodiment. To open the drawer \textit{1}, the user first lifts the lifting part \textit{122} of the lift handle \textit{12} pivotally connected to the front side of the drawer \textit{1}. Since the bottom end of the pushing part \textit{123} urges against the first guiding part \textit{32} of the fixing element \textit{3}, the first guiding part \textit{32} acts concurrently with the pivotal rotation of the pushing part \textit{123} so that the first guiding part \textit{32} displaces downward with respect to the pivotal connection point of the connecting part \textit{31}. At this moment, the engaging part \textit{33} on the outer end relatively displaces upward, so that the stopping end \textit{332} of the engaging part \textit{33} departs from the stopping element \textit{21} in the closet \textit{2}. The user can thus pull the drawer \textit{1} out of the closet \textit{1}. To put the drawer \textit{1} back into the closet \textit{2}, the user further first push the drawer \textit{1} into the closet \textit{2} and then lift the lifting part \textit{122} of the lift handle \textit{12}. The first guiding part \textit{32} acts concurrently with the pivotal rotation of the pushing part \textit{123} to displace downward. The engaging part \textit{33} on the outer end relatively displaces upward. The stopping element \textit{21} in the closet \textit{2} enters the stopping end \textit{332} along the bottom edge of the stopping part \textit{331}. When the user releases the lift handle \textit{12}, a restoring force is generated due to the weight of the lift handle \textit{12}. The bottom end of the pushing part \textit{123} thus urges against the first guiding part \textit{32} of the fixing element \textit{3} and rotates back to its original position. The first guiding part \textit{32} acts concurrently with the pivotal rotation of the pushing part \textit{123}, so that the stopping end \textit{332} of the engaging part \textit{33} engages with the stopping element \textit{21} of the closet \textit{2}. Therefore, the drawer \textit{1} is positioned inside the closet \textit{2}.

[0029] In summary, due to the engagement between the engaging part \textit{33} of the fixing element \textit{3} and the fact that the first guiding part \textit{32} on the fixing element \textit{3} is urged against by the pushing part \textit{123} of the lift handle \textit{12}, the engaging part \textit{33} does not depart from the stopping element \textit{21} even under serious shaking. The drawer \textit{1} is securely positioned in the closet \textit{2} to ensure the user’s safety. In comparison with the prior art, the invention has better positioning effect and safety.

[0030] Of course, the invention has many other embodiments that only vary in details. Please refer to FIGS. 5 to 8 for a second embodiment of the invention. The pushing part \textit{123} of the lift handle \textit{12} protrudes downward by an appropriate length. It further bends and protrudes outward with a pushing part \textit{124}. Besides, the first guiding part \textit{32} on one end of the fixing element \textit{3} protrudes upward with a second guiding part \textit{34}, forming an L-shaped guiding part. The inner surface of the second guiding part \textit{34} forms a slide guiding surface \textit{341}. The bottom end of the pushing part \textit{124} urges against the slide guiding surface \textit{341} of the second guiding part \textit{34}. As the pushing part \textit{124} of the lift handle \textit{12} pushes the second guiding part \textit{34}, the lift handle \textit{12} can slide more smoothly with respect to the fixing element \textit{33}. Moreover, a stopping element \textit{23} is disposed on an outer slide rail \textit{22} of the closet \textit{2} corresponding to the slide rail \textit{13} of the drawer \textit{1}, in correspondence with the stopping part \textit{332} of the engaging part \textit{33}. The stopping element \textit{23} is parallel to the vertical wall of the outer slide rail \textit{22}. The top surface of the stopping element \textit{23} is formed with an arc edge \textit{231} corresponding to the stopping part \textit{331}. When the drawer \textit{1} is pushed into the closet \textit{2}, the arc edge \textit{231} renders the guiding slide with respect to the stopping part \textit{331} smoother. The stopping element \textit{23} thus engages with the stopping part \textit{332}.

[0031] In addition, an elastic element \textit{35} can be disposed on the bottom of the connecting part \textit{31}, on the side toward the stopping part \textit{331}. The other end of the elastic element \textit{35} is fixed on the drawer \textit{1} to provide a restoring force for the stopping part \textit{331} of the fixing element \textit{3}. It also increases the force exerted by the stopping part \textit{331} on the stopping element \textit{21}, thereby better stabilizing the engagement between the engaging part \textit{33} and the stopping element \textit{21}. When the closet \textit{2} is seriously shaken or topples over, the engaging part \textit{33} does not depart from the stopping element \textit{21}. Therefore, the drawer \textit{1} does not slide out of the closet \textit{2}. In comparison with the prior art, the invention has better positioning effect and safety.

[0032] Although the invention has been described with reference to specific embodiments, this description is not meant to be construed in a limiting sense. Various modifications of the disclosed embodiments, as well as alternative embodiments, will be apparent to people skilled in the art. Therefore, it is contemplated that the appended claims will cover all modifications that fall within the true scope of the invention.

What is claimed is:

1. An engaging structure of a drawer of a closet, comprising:
a lift handle, which is disposed horizontally on the front side of the drawer, has a pivotal connection part for a pivotal connection to the drawer, and extends from both sides of the pivotal connection part downward with a lifting part and a pushing part;
at least one fixing element, whose bottom has a connecting part for a pivotal connection to the outer wall of the drawer;
wherein the upper end of the connecting part has a first guiding part protruding toward the lift handle, so that the bottom end of the pushing part of the lift handle normally urges against the first guiding part for pushing and rotating the first guiding part when the lift handle is lifted, the other end of the first guiding part has an engaging part with a stopping end, and the closet has a stopping element corresponding to the stopping end of the engaging part for the engagement with the stopping end when the drawer is pushed into the closet.

2. The engaging structure of a drawer of a closet as in claim 1, wherein the top surface of the first guiding part is formed with a slide guiding surface so that the bottom end of the lift handle normally urges against the slide guiding surface.

3. The engaging structure of a drawer of a closet as in claim 1, wherein the end portion of the engaging part protrudes sideways with a stopping part and the bottom end thereof forms the stopping end.

4. The engaging structure of a drawer of a closet as in claim 3, wherein the stopping part is a slant surface.

5. The engaging structure of a drawer of a closet as in claim 1, wherein the front side of the drawer is provided with a holder for its user to hold while pulling or pushing the drawer out of or into the closet.

6. The engaging structure of a drawer of a closet as in claim 5, wherein the holder is horizontally disposed along the top edge on the front side of the drawer and is an arc protrusion.

7. The engaging structure of a drawer of a closet as in claim 1, wherein the pushing part of the lift handle protrudes downward by an appropriate length and further bends and protrudes outward with a pushing part, the first guiding part of the fixing element protrudes upward with a second guiding part, and the end portion of the pushing part urges against the second guiding part.

8. The engaging structure of a drawer of a closet as in claim 7, wherein the inner surface of the second guiding part is a slide guiding surface and the end portion of the pushing part urges against the slide guiding surface.

9. The engaging structure of a drawer of a closet as in claim 1 or 7, wherein an elastic element is disposed on one side of the connecting part of the fixing element and the other end of the elastic element is fixed on the drawer.

10. The engaging structure of a drawer of a closet as in claim 1, wherein the closet is disposed with the stopping element on an outer slide rail corresponding to the a slide rail of the drawer, in correspondence with the stopping end of the engaging part.

11. The engaging structure of a drawer of a closet as in claim 10, wherein the top surface of the stopping element is formed with an arc edge corresponding to the stopping part.

12. The engaging structure of a drawer of a closet as in claim 10, wherein the stopping element is parallel to the vertical wall of the outer slide rail.

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