Design of an Intelligent Lifting Display Cabinet

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Abstract. An intelligent lifting display cabinet is designed, which includes an upper cabinet body, a lower cabinet body is connected under the upper cabinet body, a first motor is arranged on the side of the lower cabinet body, a taking groove is arranged on the upper cabinet body, a cavity is arranged in the lower cabinet body, the lower cabinet body includes a rotating transmission component, the first motor is connected with the rotating transmission component, a driving opening component is engaged on the rotating transmission component, and a rising rotation component is connected on the rotating transmission component, One end of the cover assembly is connected with the driving opening assembly, and the other end of the cover assembly is connected with the rotating transmission assembly. The display cabinet has the effect of displaying the display items in all aspects through rotation or lifting, with strong pertinence and intuition.

Keywords: Intelligent; Display Cabinet; Motor; Cabinet Body.

1. Introduction

The display cabinet is a protective display stand provided for commodity display. The color can be selected according to the decoration of the store. The display cabinet, with firm structure, easy disassembly and convenient transportation, is widely used in the company's exhibition halls, exhibitions, department stores, advertisements, etc. it is widely used in handicrafts, gifts, jewelry, mobile phones, glasses, clocks, tobacco and alcohol, cosmetics, communication equipment and other industries [1].

At present, the existing display cabinets in the market have a single display mode, which can not attract visitors, can not display goods in all aspects, can not make visitors know more information about goods or display products, and reduce the purchase volume of visitors. At the same time, display products can not be transformed from shielding state to display state, can not be displayed only when they need to be displayed and covered when they do not need to be displayed [2].

2. Technical Design Scheme

An intelligent lifting display cabinet comprises an upper cabinet body, a lower cabinet body and a first motor, the lower cabinet body is connected under the upper cabinet body, the side of the lower cabinet body is provided with a first motor, the upper cabinet body is provided with a taking groove, the lower cabinet body is provided with a cavity, the lower cabinet body includes a rotating transmission component, an upward rotating component, a driving opening component and a covering component, the first motor is connected with a rotating transmission component, and the rotating transmission component is engaged with a driving opening component, A rising rotating component is connected to the rotating transmission component, one end of the covering component is connected to the driving opening component, and the other end of the covering component is connected to the rotating transmission component.

Upper cabinet-1, lower cabinet-2, first motor-3, rotating transmission assembly-201, rising rotation assembly-202, driving opening assembly-203, covering assembly-204, first rotating shaft-2011, first turbine-2012, belt-2013, pulley-2014, traction line-2015, support rod-2021, second rotating shaft-2022, second turbine-2023, second worm-2024, support column-2025, threaded hole-2026, second motor box-2027, display board-2028, first worm-2031, Helical gear-2032, helical disk-2033, first gear-2034, support block-2035, rack-2036, first slider-2037, limit bar-2038, second gear-2039, third rotating shaft-20310, covering cloth-2041, second slider-2042 and second chute-2043.

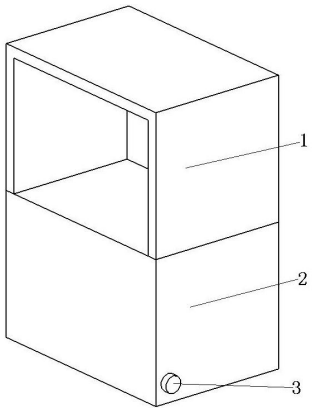


Fig 1. Structural diagram of an intelligent lifting display cabinet

Compared with the existing display cabinet, the designed display cabinet has the following advantages:

1. The display cabinet is equipped with a rising rotation component, which includes a support rod, a second rotating shaft, a second turbine, a second worm, a support column, a threaded hole, a second motor box and a display board. The first motor rotates forward, which can make the display board rotate upward, which solves the problem that the existing display cabinet has no function of rotation plus rising and falling. When people use the display cabinet, they can fully understand the display products in the display cabinet, It improves visitors' understanding of the exhibits and enhances the purchase of the exhibits.

2. A driving opening component and a covering component are arranged. The driving opening component includes a first worm, a helical gear, a helical gear plate, a first gear, a support block, a rack, a second gear and a third rotating shaft. The covering component includes a covering cloth, a second sliding block and a second chute. The setting of the driving opening component and the covering component enables the covering cloth to quickly cover and not cover the display articles, and the display articles can be transformed from the covering state to the display state, It can be displayed only when it is needed and covered when it is not needed. The display is highly targeted and intuitive [3].

3.Example given to illustrate

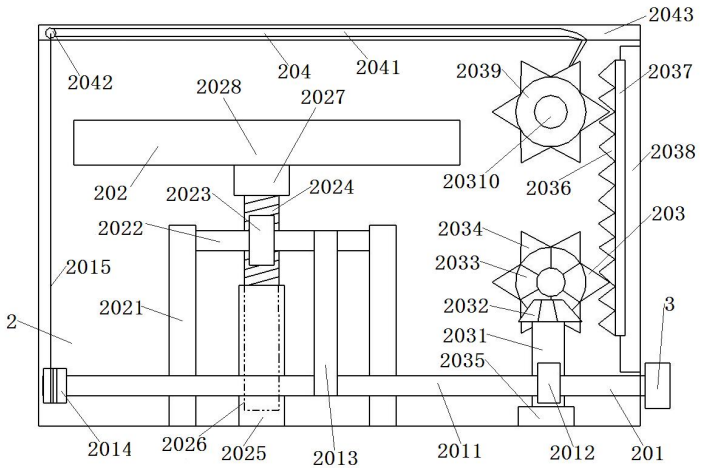


Fig 2. Front view internal structure diagram of the lower cabinet of an intelligent lifting display cabinet

An intelligent lifting display cabinet comprises an upper cabinet 1, a lower cabinet 2 and a first motor 3. The lower part of the upper cabinet 1 is connected with the lower cabinet 2, the side of the lower cabinet 2 is provided with the first motor 3, the upper cabinet 1 is provided with a taking groove, the lower cabinet 2 is provided with a cavity, the lower cabinet 2 includes a rotating transmission assembly 201, a rising rotation assembly 202, a driving opening assembly 203 and a covering

assembly 204, and the first motor 3 is connected with the rotating transmission assembly 201, The rotating transmission assembly 201 is engaged with the driving opening assembly 203, the rotating transmission assembly 201 is connected with the rising rotation assembly 202, one end of the covering assembly 204 is connected with the driving opening assembly 203, and the other end of the covering assembly 204 is connected with the rotating transmission assembly 201.

In order to facilitate the operation of driving the opening assembly 203 and the operation of the rising rotating assembly 202, the rotating transmission assembly 201 includes a first rotating shaft 2011, a first turbine 2012, a belt 2013, a pulley 2014 and a traction line 2015. The output end of the first motor 3 is connected with a rotating shaft penetrating the inner wall of the lower cabinet 2, the rotating shaft is connected with the first rotating shaft 2011, one end of the first rotating shaft 2011 is sleeved with the first turbine 2012, and one side of the first turbine 2012 is engaged with the driving opening assembly 203, The other end of the first rotating shaft 2011 is sleeved with the cable wheel 2014, the traction line 2015 is connected to the cable wheel 2014, the other end of the traction line 2015 is connected with the cover assembly 204, the middle position of the first rotating shaft 2011 is connected with the rising rotating assembly 202 through the belt 2013, and the first motor 3 is started to rotate the first rotating shaft 2011, which is convenient to drive the operation of the opening assembly 203 and the operation of the rising rotating assembly 202.

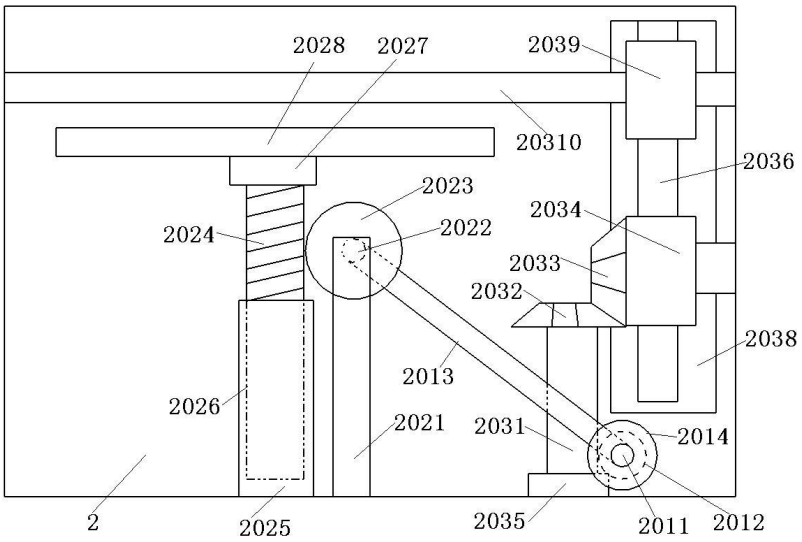


Fig 3. Left view internal structure diagram of the lower cabinet of an intelligent lifting display cabinet

The display cabinet is provided with a rising rotating component 202. When the first motor 3 rotates forward, the display board 2028 can rotate and move up, which solves the problem that the existing display cabinet has no function of rotation plus rising and falling. When people use the display cabinet, they can fully understand the display items in the display cabinet, improve the understanding of visitors and enhance the purchase of display items. The rising rotating component 202 includes a support rod 2021, a second rotating shaft 2022 The second turbine 2023, the second worm 2024, the support column 2025, the threaded hole 2026, the second motor box 2027 and the display board 2028. The first rotating shaft 2011 on the rotating transmission assembly 201 is connected with the second rotating shaft 2022 through belt 2013. Both ends of the second rotating shaft 2022 are connected with a support rod 2021 connected with the inner bottom plate of the lower cabinet 2, and the second turbine 2023 is sleeved on the second rotating shaft 2022, The second worm 2024 is engaged in clearance connection on one side of the second turbine 2023, the lower end of the second worm 2024 is threaded with a support column 2025 through a threaded hole 2026, the support column 2025 is fixedly connected with the inner bottom plate of the lower cabinet 2, the second worm 2024 is connected with a second motor box 2027, a second motor is arranged in the second motor box 2027, and the output end of the second motor is connected with a display board 2028 through a

second rotating shaft, At the middle of the first rotating shaft 2011, the second rotating shaft 2022 on the rising rotating assembly 202 is driven and connected through the belt 2013, so that the second rotating shaft 2022 rotates, and the rotation of the second rotating shaft 2022 drives the second turbine 2023 sleeved on the second rotating shaft 2022 to rotate, while the clearance connection on one side of the second turbine 2023 is engaged with the second worm 2024, and the lower end of the second worm 2024 is threaded with the support column 2025 through the threaded hole 2026, The rotation of the second turbine 2023 makes the second worm 2024 rotate, so as to make the second worm 2024 move upward, drive the display board 2028 arranged on the second worm 2024 to rotate and move upward, so as to facilitate the rise of the display board 2028. The display board 2028 is placed with display articles, so that the display articles on the display board 2028 can be displayed [4].

3. Working Principle

When the display object or needs to be displayed, the display object will be transformed from the shielding state to the display state. The first motor 3 starts to rotate the first rotating shaft 2011. The middle position of the first rotating shaft 2011 is connected with the second rotating shaft 2022 on the rising rotating assembly 202 through belt 2013, so that the second rotating shaft 2022 rotates, and the second rotating shaft 2022 rotates to drive the second turbine 2023 sleeved on the second rotating shaft 2022 to rotate, The second worm 2024 is engaged in clearance connection on one side of the second turbine 2023, and the lower end of the second worm 2024 is threaded with the support column 2025 through the threaded hole 2026. The rotation of the second turbine 2023 makes the second worm 2024 rotate, which makes the second worm 2024 move upward and drives the display board 2028 arranged on the second worm 2024 to rotate upward. When the first rotating shaft 2011 rotates, at the same time, The first rotating shaft 2011 is sleeved with the first turbine 2012 and the wire wheel 2014 to drive the covering assembly 204 and the opening assembly 203. The first turbine 2012 on the rotating transmission assembly 201 is meshed and connected with the first worm 2031. The rotation of the first turbine 2012 causes the first worm 2031 to rotate. The first worm 2031 is provided with a helical gear 2032. One side of the helical gear 2032 is meshed with a helical disk 2033, and one side of the helical disk 2033 is connected with the first gear 2034, One side of the first gear 2034 is meshed with a rack 2036, and the first gear 2034 is provided with a second gear 2039 meshing with the rack 2036. The rotation of the first worm 2031 makes the first gear 2034 rotate, thereby driving the rack 2036 to move up. At this time, the rack 2036 moves up to make the second gear 2039 rotate, and the third rotating shaft 20310 connected to the second gear 2039 also rotates, so that the covering cloth 2041 rotates and is rolled up along the third rotating shaft 20310, The cover assembly 204 on the other side is moving at the same time. The wire wheel 2014 rotates to release the lead wire 2015. The two ends on one side of the cover cloth 2041 are connected with the second slider 2042. Each second slider 2042 is provided with a limited connection hole. The limited connection hole is connected with the lead wire 2015 through the traction branch line, so that the second slider 2042 slides to the right in the second chute 2043, so that the cover cloth 2041 can be rolled up by the third rotating shaft 20310, In this way, the covering cloth 2041 on the lower cabinet 2 is put away, so that the display board 2028 can rotate and move up to display the display products or commodities. Then, if you want to rotate the display products or commodities, the second motor in the second motor box 2027 starts to drive the display board 2028 to rotate, so that the display products or commodities placed on the display board 2028 can be displayed in all aspects.

4. Conclusion

Compared with the prior art, this design proposes an intelligent lifting display cabinet, which solves the problem that it can not display all aspects of goods, and can not make visitors know more information about goods or exhibits. At the same time, it also solves the problems that the exhibits can not be transformed from the shielding state into the display state, can not be displayed when they

need to be displayed, and can not be covered when they do not need to be displayed, It has the effect of displaying the exhibits in all aspects through rotation or lifting, with strong pertinence and intuition.

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