

DESCRIPTION

DOUBLE-SIDED DRAWER STRUCTURE

TECHNICAL FIELD

[0001]

The present invention relates to a double-sided drawer structure in which a drawer is drawable from both sides of the front side and the back side of a housing space.

BACKGROUND ART

[0002]

This type of double-sided drawer structure allows washing dishes and storing them in a drawer from a kitchen side, and drawing the drawer from a dining area side to serve the washed dishes at the time of serving, is therefore convenient, and appropriately applied for a counter kitchen, thus becoming popular.

[0003]

For example, in Patent Document 1, a drawer device that is drawable from both sides of the front side and the back side using one drawer rail is disclosed. In this drawer device described in Patent Document 1, rollers 4 that rotate in positive and negative directions are provided at two positions on the front and back of both left and right-side plates 31, 32, rails 5 are provided on both left and right inner surfaces of a housing body to which the rollers 4 are opposed, a stopping portion comes into contact with a roller 4 that passes first, which causes the stopping portion to project on the rail 5, and when a subsequent roller 4 comes into contact with the stopping portion, the passing of the subsequent roller 4 is obstructed, and thus, a stopper 6 that disables a drawer from being drawn anymore is provided (see claim 1 in Claims, paragraphs [0010] to [0019] in Description, and Fig. 1 to Fig. 3 in Drawings, and the like of Patent

Document 1).

[0004]

However, the drawer device described in Patent Document 1 has a problem that, in order to be drawable from both sides, the rail 5 that is a movable portion cannot be covered with a modesty panel of the drawer, and mechanism portions, such as the rails and rollers, are exposed, thus having a poor appearance.

[0005]

In addition, the drawer device described in Patent Document 1 also has a problem that, in order to be drawable from both sides, a stopper that stops the drawer main body in a state of the drawer main body being housed in the housing space cannot be provided, and therefore when closing the drawer, the drawer directly pops out from the opposite side due to an inertial force. Note that the stopper 6 of the drawer device described in Patent Document 1 is a stopper that latches and stops the roller 4 positioned at an end portion of a drawer 3 to avoid the drawer 3 from being completely pulled out and removed from a housing body 1, and is not a stopper that avoids the drawer 3 from popping out from the opposite side of the housing body 1 due to the inertial force when closing the drawer 3 in the opposite side.

[0006]

As a method to solve such problems, suppressing the inertial force at the time of closing by attaching a push-in type catch or the like can be considered. However, since the drawer main body needs to be drawn from both sides, when the inertial force exceeds a certain amount, it has not been possible to avoid the drawer main body from popping out from the opposite side.

[0007]

Moreover, the drawer device described in Patent Document 1, which is a

mechanism that allows drawing from both sides using one drawer rail, also has problems of having a complicated structure, having a large thickness, being difficult to be concealed, and on top of that, easily breaking down when dust or the like is caught in the mechanism, and being expensive.

[0008]

In addition, Patent Document 2 discloses a double-pull drawer structure in which drawer rails are provided separately in two levels of an upper side and a lower side, and the drawer rails are concealed by a front plate. In this double-pull drawer structure described in Patent Document 2, corresponding to a front plate 10 and a housing box body 8 drawn outward entering a connected state, restricting means 47, 49, 86, 88, which restrict relative movements in the front-back directions of the front plate 10 and the housing box body 8 that are drawn, are provided, and thereby the double-pull drawer structure is considered to allow avoiding rattling, collision, or the like of the front plate against the housing box body when the housing box body is being housed.

[0009]

However, while the double-pull drawer structure described in Patent Document 2 can conceal the drawer rails when the drawer is housed, the problem that the drawer pops out from the opposite side when closing the drawer has not been able to be solved. Moreover, in the double-pull drawer structure described in Patent Document 2, there is also a problem that as the drawer pops out, it causes a front plate 9 to open as well.

[0010]

Moreover, the double-pull drawer structure described in Patent Document 2 also has a complicated structure, and similarly to the drawer device described in Patent Document 1, has a problem of easily breaking down when dust or the like is caught, and being expensive.

[0011]

Patent Document 1: JP-A-2003-304945

Patent Document 2: JP-A-2006-43189

DISCLOSURE OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0012]

Therefore, the present invention has been invented in consideration of the above-described problems, and an object thereof is to provide a double-sided drawer structure in which a drawer mechanism has a structure that is simple and concealable as much as possible, and can avoid a drawer from popping out from the opposite side due to an inertial force when closing the drawer.

SOLUTIONS TO THE PROBLEMS

[0013]

A double-sided drawer structure according to a first invention is a double-sided drawer structure including a drawer that is drawable from both sides of a front side and a back side of a housing space. The drawer includes a drawer main body and an outer frame having a U-shape in a plan view that is provided outside of the drawer main body. An outer-side drawer rail is provided between the outer frame and a side plate of the housing space. An inner-side drawer rail is provided between the outer frame and the drawer main body. A soft close mechanism is provided to the outer-side drawer rail and the inner-side drawer rail. The soft close mechanism avoids the drawer from popping out from an opposite side due to an inertial force when closing the drawer.

[0014]

In a double-sided drawer structure according to a second invention, which is in the first invention, the soft close mechanism includes a tension spring that pulls back a rail in an open state, and a damper that applies a load against a restoring force of the tension spring.

[0015]

In a double-sided drawer structure according to a third invention, which is in the first invention or the second invention, a side frame of the drawer main body has an inverse L-shaped cross section covering the inner-side drawer rail from thereabove.

[0016]

A double-sided drawer structure according to a fourth invention, which is in any one of the first invention to the third invention, the back side of the housing space is provided with a flap door.

[0017]

A double-sided drawer structure according to a fifth invention, which is in the fourth invention, left and right lower ends of the drawer main body are configured to avoid a hinge of the flap door.

[0018]

A double-sided drawer structure according to a sixth invention, which is in any one of the first invention to the fifth invention, the housing space is provided under a counter of a counter kitchen.

[0019]

A double-sided drawer structure according to a seventh invention, which is in the sixth invention, a lower end of the outer frame is ensured to have a height of 105 mm or more from a worktop of the counter kitchen.

EFFECTS OF THE INVENTION

[0020]

According to the first invention to the seventh invention, since the drawer rail as the drawer mechanism is provided separately as two pairs of two rails of the outer-side drawer rail and the inner-side drawer rail, not only does the mechanism of one rail become simple, and durability of the drawer mechanism improve, but the thickness per rail also decreases and allows a structure that can conceal the rails from the human line of vision. In addition, according to the first invention to the seventh invention, since the soft close mechanism that avoids the drawer from popping out from the opposite side due to the inertial force when closing the drawer is provided, even when the drawer is swiftly closed, the drawer can be avoided from popping out from the opposite side due to the inertial force.

[0021]

Especially, according to the third invention, since the side frame of the drawer main body has an inverse L-shaped cross section covering the inner-side drawer rail from above, the inner-side drawer rail can be concealed being almost unseeable from the human line of vision.

[0022]

Especially, according to the fourth invention, since the back side of the housing space is provided with the flap door, the double-sided drawer structure can be concealed by the flap door in a state of the drawer not being drawn.

[0023]

Especially, according to the fifth invention, since the left and right lower ends of the drawer main body are configured to avoid the hinge of the flap door, there is no difficulty in drawing or inserting the drawer from/into the back side, and the space can

be effectively utilized without sacrificing a storage height of the drawer.

[0024]

Especially, according to the sixth invention and the seventh invention, since the lower end of the outer frame is ensured to have the height of 105 mm or more from the worktop of the counter kitchen, a height that allows installing a back guard can be ensured, and the drawer can be drawn or inserted in a state of cooking utensils, such as a bowl, being kept placed on the worktop, and therefore does not create a hindrance for a cooking operation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025]

Fig. 1 is a drawing illustrating a case of a double-sided drawer structure according to an embodiment of the present invention being applied to a counter kitchen and viewed from a kitchen side.

Fig. 2 is a drawing illustrating a case of the same double-sided drawer structure being applied to the counter kitchen and viewed from a dining area side.

Fig. 3 is a front view of the same double-sided drawer structure viewed from the kitchen side (K side).

Fig. 4 is a back view of the same double-sided drawer structure viewed from the dining area side (D side).

Fig. 5 is a partial vertical cross-sectional view mainly illustrating drawer rails of the same double-sided drawer structure.

Fig. 6 is a perspective view illustrating only an outer frame of a drawer of the same double-sided drawer structure.

Fig. 7 is a perspective view illustrating only a drawer main body of the drawer

of the same double-sided drawer structure.

Fig. 8 is a drawing illustrating a soft close mechanism of the drawer rails of the same double-sided drawer structure.

Fig. 9 is a function explanatory view illustrating a function of the same soft close mechanism.

Fig. 10 is a drawing indicating a height, from a worktop, of the drawer of the same double-sided drawer structure.

DESCRIPTION OF PREFERRED EMBODIMENTS

[0026]

The following describes a configuration for executing a double-sided drawer structure to which the present invention is applied in detail with reference to the drawings.

[0027]

First, using Fig. 1 to Fig. 10, a double-sided drawer structure 1 according to an embodiment of the present invention will be described. Fig. 1 is a drawing illustrating a case of the double-sided drawer structure 1 according to the embodiment of the present invention being applied to a counter kitchen 10 and viewed from a kitchen side, and Fig. 2 is a drawing illustrating a case of the double-sided drawer structure 1 according to the present embodiment being applied to the counter kitchen 10 and viewed from a dining area side. As illustrated in Fig. 1 and Fig. 2, the double-sided drawer structure 1 according to the embodiment of the present invention is described by exemplifying a double-sided drawer structure in which a housing space 12 is provided under a counter 11 at the back of the kitchen of the counter kitchen 10, and can be drawn from both sides of the kitchen side (K side) as the front and the dining area side

(D side) as the back.

[0028]

Note that the reference numeral 13 indicated in Fig. 1 refers to a worktop 13 and the reference numeral 14 refers to a sink 14 of the counter kitchen 10. The reference numeral 15 indicated in Fig. 2 refers to a flap door 15 for blocking the double-sided drawer structure 1 such that the double-sided drawer structure 1 cannot be seen from the dining area side (D side).

[0029]

The double-sided drawer structure 1 according to the present embodiment includes, as illustrated in Fig. 3 to Fig. 5, a drawer 2, a left and right pair of outer-side drawer rails 3, 3 and a left and right pair of inner-side drawer rails 4, 4 for allowing this drawer 2 to be openably and closably drawn. Fig. 3 is a front view of the double-sided drawer structure viewed from the kitchen side (K side), and Fig. 4 is a back view of the double-sided drawer structure being viewed from the dining area side (D side). In addition, Fig. 5 is a partial vertical cross-sectional view mainly illustrating the drawer rails 3, 4 of the double-sided drawer structure 1. Note that the reference numeral 16 refers to a side plate 16 of the housing space 12, and the reference numeral 17 refers to a bottom plate 17 of the housing space 12.

[0030]

(Drawer)

The drawer 2 is constituted of, for example, an outer frame 5 made of a woody material, a metal, such as an aluminum alloy or a steel plate, or a resin illustrated in Fig. 6, and a drawer main body 6 made of a woody material or a resin illustrated in Fig. 7. Here, a woody material refers to a material made by disassembling wood into large and small elements and solidifying them with an adhesive or the like to reassemble them,

such as wood including solid wood, plywood having a surface to which a veneer or the like is attached, laminated veneer lumber, or laminated wood. Fig. 6 is a perspective view illustrating only the outer frame 5 of the drawer 2 of the double-sided drawer structure 1, and Fig. 7 is a perspective view illustrating only the drawer main body 6 of the drawer 2 of the double-sided drawer structure 1.

[0031]

As illustrated in Fig. 6, the outer frame 5 is a frame body having a U-shape in a plan view, and is constituted of, for example, a modesty panel 50 and a left and right pair of frame beams 51, 51 having a vertically elongate rectangular cross section and being installed vertically with respect to a plate surface of this modesty panel 50. Furthermore, as illustrated in Fig. 5, the outer-side drawer rail 3 is interposed between this frame beam 51 and the side plate 16 of the housing space 12, and the outer frame 5 is configured to be slidable by the outer-side drawer rail 3 with respect to the side plate 16 of the housing space 12.

[0032]

As illustrated in Fig. 7, the drawer main body 6 is constituted of, for example, a modesty panel 60, a left and right pair of side frames 61 having an inverse L-shaped cross section, a back plate 62, and a bottom plate 63, and has a function for placing an object to be housed on the bottom plate 63 to be housed. Furthermore, as illustrated in Fig. 5, the inner-side drawer rail 4 is interposed between this side frame 61 and the frame beam 51, and the drawer main body 6 is configured to be slidable by the inner-side drawer rail 4 with respect to the outer frame 5.

[0033]

(Drawer Rail)

In the double-sided drawer structure 1 according to the present embodiment,

the outer-side drawer rail 3 and the inner-side drawer rail 4 have the same configuration. It is surely needless to say that the outer-side drawer rail 3 and the inner-side drawer rail 4 may have different configurations. However, as in the double-sided drawer structure 1 according to the present embodiment, the outer-side drawer rail 3 and the inner-side drawer rail 4 having the same configuration allows reducing the number of components and achieving cost reduction.

[0034]

As illustrated in Fig. 5, the outer-side drawer rail 3 is constituted of an outer rail 30, a middle rail 31, and an inner rail 32, the outer rail 30 is fixed to an inner side of the side plate 16 of the housing space 12, and the inner rail 32 is fixed to an outer side of the frame beam 51 of the outer frame 5.

[0035]

Similarly, as illustrated in Fig. 5, the inner-side drawer rail 4 is constituted of an outer rail 40, a middle rail 41, and an inner rail 42, the outer rail 40 is fixed to an inner side of the frame beam 51 of the outer frame 5, and the inner rail 42 is fixed to an outer side of the side frame 61 of the drawer main body 6.

[0036]

(Soft Close Mechanism)

In addition, as illustrated in Fig. 8, a soft close mechanism 7 is mounted to the outer-side drawer rail 3 and the inner-side drawer rail 4. This soft close mechanism 7 mainly includes a spring coil 33 (43) as a tension spring and an oil damper 34 (44), and is provided with a function of avoiding the drawer 2 from popping out from the opposite side due to an inertial force when closing the drawer 2.

[0037]

Specifically, as illustrated in Fig. 8, the outer rail 30 (40) and the middle rail 31

(41) are coupled by the spring coil 33 (43), and a load is applied by the oil damper 34 (44) in a direction corresponding to a restoring force of the spring coil 33 (43).

Therefore, in a state of the drawer 2 being closed, that is, in a state where the middle rail 31 (41) is in a certain distance or less away from the outer rail 30 (40), the inner rail 32 (42) is pulled back by the spring coil 33 (43) with respect to the outer rail 30 (40).

[0038]

At this time, since a load is applied by the oil damper 34 (44) in the direction corresponding to the restoring force of the spring coil 33 (43), the inner rail 32 (42) is slowly pulled back by the spring coil 33 (43) with respect to the outer rail 30 (40).

[0039]

That is, as illustrated in Fig. 9, when the drawer 2 is swiftly closed in the arrow A direction from the dining area side (D side), the inertial force thereof might possibly cause the outer frame 5 to pop out in the arrow B direction. However, the oil damper 34 (44) reduces the inertial force that causes the outer frame 5 to pop out in the arrow B direction, and moreover, since the outer rail 30 and the middle rail 31 of the outer-side drawer rail 3 are coupled by the spring coil 33, the middle rail 31 and the inner rail 32 are pulled back by the restoring force of the spring coil 33, and the outer frame 5 fixed to the inner rail 32 is also pulled back in the arrow C direction (also see Fig. 5). Fig. 9 is a function explanatory view illustrating the function of the soft close mechanism.

[0040]

At this time, due to the function of the oil damper 34, the outer frame 5 is slowly and softly pulled back in the arrow C direction. Therefore, it is possible to avoid the outer frame 5 from being swiftly pulled back by the restoring force of the spring coil 33 and, due to the inertial force thereof, the drawer main body 6 from opening on the opposite side (also see Fig. 8).

[0041]

Similarly, as illustrated in Fig. 9, when the drawer 2 is swiftly closed in the arrow D direction from the kitchen side (K side), the inertial force thereof causes the drawer main body 6 to pop out in the arrow E direction. However, since the outer rail 40 and the middle rail 41 of the inner-side drawer rail 4 are coupled by the spring coil 43, the middle rail 41 and the inner rail 42 are pulled back by the restoring force of the spring coil 43, and the drawer main body 6 fixed to the inner rail 42 is also pulled back in the arrow F direction (also see Fig. 5).

[0042]

At this time, due to the function of the oil damper 44, the drawer main body 6 is slowly and softly pulled back in the arrow F direction. Therefore, it is possible to avoid the drawer main body 6 from being swiftly pulled back by the restoring force of the spring coil 43 and, due to the inertial force thereof, the outer frame 5 from opening on the opposite side (also see Fig. 8).

[0043]

(Drawer Height)

Regarding the height of the drawer 2, as illustrated in Fig. 10, a height H1 from the worktop 13 to a lower end of the modesty panel 50 of the outer frame 5 is 105 mm or more. Fig. 10 is a drawing indicating the height, from the worktop 13, of the drawer 2. By ensuring this predetermined height H1 to be 105 mm or more, a back guard can be installed on the back of the worktop 13, and the drawer 2 can be drawn or inserted in a state of cooking utensils, such as a bowl, being kept placed on the worktop 13 and therefore does not create a hindrance for a cooking operation.

[0044]

(Left and Right Lower Ends of Drawer Main Body)

Furthermore, as illustrated in Fig. 5, the bottom plate 63 of the drawer main body 6 that becomes a drawer on the dining area side of the drawer 2 does not extend up to left and right ends of the drawer main body 6, and the left and right lower ends of the drawer main body 6 are configured to avoid a hinge 15a of the flap door 15. Therefore, in the double-sided drawer structure 1, the drawer 2 can be drawn from or inserted into the dining area side without any difficulty, and the space is effectively utilized without sacrificing a storage height of the drawer 2.

[0045]

[Operational Advantage of Embodiment]

The double-sided drawer structure 1 according to the embodiment of the present invention described above is a double-sided drawer structure that is drawable from both sides of the front side (kitchen side) and the back side (dining area side), in which the drawer rails as the drawer mechanism are provided separately as two pairs of two rails of the outer-side drawer rails 3 and the inner-side drawer rails 4. Therefore, the mechanism of one rail becomes simple, complicity is avoided, which reduces the risk of dust being caught or the like, and durability of the drawer mechanism improves.

[0046]

Moreover, in the double-sided drawer structure 1, the left and right pair of side frames 61 of the drawer main body 6 have an inverse L-shaped cross section covering the inner-side drawer rail 4 between the frame beam 51 and the side frame 61 of the outer frame 5 from above. Therefore, either when the drawer 2 is drawn from the kitchen side or the dining area side, the inner-side drawer rail 4 can be concealed becoming almost unseeable from above, which is the human line of vision.

[0047]

In addition, since the double-sided drawer structure 1 is provided with the flap

door 15 for blocking the double-sided drawer structure 1 such that the double-sided drawer structure 1 cannot be seen from the dining area side, in a state of the drawer 2 not being drawn, the double-sided drawer structure 1 is able to be concealed being completely unseen from the dining area side.

[0048]

Moreover, at this time, as described above, the left and right lower ends of the drawer main body 6 are configured to avoid the hinge 15a of the flap door 15. Therefore, in the double-sided drawer structure 1, the drawer 2 can be drawn from or inserted into the dining area side without any difficulty, and the space is effectively utilized without sacrificing the storage height of the drawer 2.

[0049]

Furthermore, in the double-sided drawer structure 1, the soft close mechanism 7 is provided to both the outer-side drawer rail 3 and the inner-side drawer rail 4. Therefore, even when the drawer 2 is swiftly closed from either the kitchen side or the dining area side, it is possible to avoid the drawer 2 from popping out from the opposite side due to the inertial force by the soft close mechanism 7 that pulls back the drawer 2.

[0050]

In addition to that, since the double-sided drawer structure 1 has the height H1 from the worktop 13 to the lower end of the modesty panel 50 of the outer frame 5 that is 105 mm or more, a back guard can be installed on the back of the worktop 13, and the drawer 2 can be drawn or inserted in a state of cooking utensils, such as a bowl, being kept placed on the worktop 13 and therefore does not create a hindrance for a cooking operation.

[0051]

While the double-sided drawer structure 1 according to the embodiment of the

present invention has been described in detail above, any embodiment described above or has been illustrated merely indicates one embodiment that has been embodied to execute the present invention. Therefore, they do not allow the technical scope of the present invention to be interpreted in a limited way.

[0052]

Especially, while the double-sided drawer structure 1 according to the embodiment of the present invention has been described by exemplifying a double-sided drawer structure applied to the counter kitchen 10, the double-sided drawer structure according to the present invention is not limited to a counter kitchen, and can be applied to a double-sided drawer structure in which a drawer is drawable from both sides of the front side and the back side of a housing space.

DESCRIPTION OF REFERENCE SIGNS

[0053]

- 1: Double-sided drawer structure
- 2: Drawer
- 3: Outer-side drawer rail (drawer rail)
- 30: Outer rail
- 31: Middle rail
- 32: Inner rail
- 33: Spring coil (tension spring)
- 34: Oil damper (damper)
- 4: Inner-side drawer rail (drawer rail)
- 40: Outer rail
- 41: Middle rail

42:	Inner rail
43:	Spring coil (tension spring)
44:	Oil damper (damper)
5:	Outer frame (drawer)
50:	Modesty panel
51:	Frame beam
6:	Drawer main body (drawer)
60:	Modesty panel
61:	Side frame
62:	Back plate
63:	Bottom plate
7:	Soft close mechanism
10:	Counter kitchen
11:	Counter
12:	Housing space
13:	Worktop
14:	Sink
15:	Flap door
15a:	Hinge
16:	Side plate
17:	Bottom plate

CLAIMS

1. A double-sided drawer structure comprising
a drawer that is drawable from both sides of a front side and a back side of a housing space, wherein
the drawer includes a drawer main body and an outer frame having a U-shape in a plan view that is provided outside of the drawer main body,
an outer-side drawer rail is provided between the outer frame and a side plate of the housing space,
an inner-side drawer rail is provided between the outer frame and the drawer main body, and
a soft close mechanism is provided to the outer-side drawer rail and the inner-side drawer rail, and the soft close mechanism avoids the drawer from popping out from an opposite side due to an inertial force when closing the drawer.
2. The double-sided drawer structure according to claim 1, wherein
the soft close mechanism includes a tension spring that pulls back a rail in an open state, and a damper that applies a load against a restoring force of the tension spring.
3. The double-sided drawer structure according to claim 1 or 2, wherein
a side frame of the drawer main body has an inverse L-shaped cross section covering the inner-side drawer rail from thereabove.
4. The double-sided drawer structure according to any one of claims 1 to 3, wherein

the back side of the housing space is provided with a flap door.

5. The double-sided drawer structure according to claim 4, wherein
left and right lower ends of the drawer main body are configured to avoid a
hinge of the flap door.
6. The double-sided drawer structure according to any one of claims 1 to 5,
wherein
the housing space is provided under a counter of a counter kitchen.
7. The double-sided drawer structure according to claim 6, wherein
a lower end of the outer frame is ensured to have a height of 105 mm or more
from a worktop of the counter kitchen.