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(54) **WASHING MACHINE INCLUDING DRAWER**

WASCHMASCHINE MIT SCHUBLADE

MACHINE À LAVER COMPRENANT UN TIROIR

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(56) References cited:

EP-A1- 2 003 237 WO-A1-02/052091
WO-A1-2016/140489 DE-A1- 3 101 745

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Description

[0001] The present invention relates to a washing machine including a drawer, and in particular, to a device for locking or unlocking a drawer.

[0002] Some washing machines include drawer structures, where the drawers have accommodation spaces, configured to store or temporarily hold items or clothing treating agents. Some drawers are further provided with locking devices so that the drawers may be locked in closed positions and may be opened after being unlocked.

[0003] It is known that unlocking buttons are disposed on panels of some drawers, and users may unlock the drawers by pressing the buttons, and close the drawers and lock the locking devices by pressing the remaining parts of the panels. As a result, the design of the panel is limited by the size of the button to ensure that a sufficient fixed portion of the panel is left to push the drawer. With increasingly simplified appearance design, the structure of the button becomes an obstacle to simplification of the panel design.

[0004] A washing machine comprising a drawer is disclosed in WO 2016/140489 A1. The drawer comprises a linearly moveable lock body and a spring acting on the lock body wherein the drawer is configured to be pulled out from a housing and to be restricted the movement of the drawer when the lock body is in a locked position.

[0005] An object of the present invention is to provide a washing machine that is an improvement on the existing technologies.

[0006] The present invention includes a washing machine including a drawer, where the washing machine includes a housing accommodating the drawer, where the drawer includes a panel and a tray connected to the panel, a linearly movable lock body is provided on the tray, the lock body includes a tongue portion, the housing includes a lock slot capable of accommodating the tongue portion to restrict movement of the drawer, and a first spring acts on the lock body and applies a force to the lock body in a direction that causes the tongue portion to be inserted into the lock slot, where the lock body further includes a first slope inclined relative to a movement direction of the lock body, the panel includes a fixed portion and a moving portion movable relative to the fixed portion, the moving portion includes a push rod, a head portion of the push rod faces the first slope when the lock body is in a locked position, that is, when the tongue portion is located in the lock slot, and the head portion of the push rod is located in a recess at the bottom of the first slope when the lock body is in an unlocked position, that is, when the tongue portion is detached from the lock slot and the first spring releases a thrust to push the lock body to move to a pre-mounting position; and the tongue portion has a second slope facing a push-in direction of the drawer.

[0007] When the lock body is in the locked position, since the head portion of the push rod faces the first slope,

a user may push the moving portion to drive the push rod to push the first slope of the lock body. In this way, the lock body compresses the first spring to leave the locked position, the tongue portion exits from the lock slot to implement unlocking. In this way, the drawer may be opened. When the lock body is in the unlocked position, the head portion of the push rod is restricted by the recess, so that by pushing the moving portion on the panel, the lock body and the tray connected to the lock body may be pushed to move along a direction of closing the drawer. After the tray is pushed to such an extent that the second slope of the tongue portion of the lock body is close to the lock slot, the lock body is pressed downward along the second slope and continues to move forward to eventually make the tongue portion enter the lock slot to implement locking.

[0008] The drawer moves back and forth along a first direction, the lock body moves along a second direction, and the first direction is approximately perpendicular to the second direction.

[0009] Therefore, it can be seen that, the user can implement unlocking and locking functions respectively by pushing the moving portion on the panel of the drawer, or can push the fixed portion to close and lock the drawer. Therefore, the design of the moving portion is very free, and also makes it easy for the user to operate the drawer.

[0010] In some embodiments, the drawer is provided inside with a compartment accommodating a clothing treating agent.

[0011] In some embodiments, a second spring applies a pressure to the moving portion.

[0012] In some embodiments, the recess is of a curved-surface concave structure, and the head portion of the push rod has a curved-surface convex structure adapted to the recess. The fit between the curved-surface convexity and the curved-surface concavity makes the push rod and the lock body have a necessary bonding force so that the tray can be pushed. In addition, the head portion of the push rod may be detached from the fit with the recess when the second slope of the tongue portion is subjected to a force to press the lock body downward so that the lock body may move to implement locking.

[0013] In some embodiments, the moving portion moves along the first direction.

[0014] In some embodiments, the moving portion of the panel includes a first surface away from the tray, the fixed portion of the panel includes a second surface away from the tray, and the area of the first surface is greater than the area of the second surface. In this way, the user can operate the moving portion more easily. Additionally, when the first surface is large enough, the panel is more integral, facilitating the exertion and expansion of industrial design work.

[0015] The structure of the present invention and other inventive objectives and beneficial effects thereof will become more comprehensible from the description of the exemplary embodiments with reference to the accompanying drawings.

[0016] The following accompanying drawings, as a part of the specification and provided to further understand the present invention, describe specific implementations of the present invention and are used to describe the principle of the present invention along with the specification, where:

FIG. 1 is a schematic cross-sectional view of a drawer of a washing machine in a locked state; and

FIG. 2 is a schematic cross-sectional view of a drawer of a washing machine in a pulled-out state.

[0017] As shown in FIG. 1 and FIG. 2, a washing machine includes a drawer 1 and a housing 2 accommodating the drawer 1. In the housing 2, the drawer 1 may move back and forth along a first direction X. The drawer 1 may be a clothing treating agent addition box, a strainer or a storage box. When the drawer 1 is used as a clothing treating agent addition box, compartments 101 and 102 accommodating a clothing treating agent are disposed inside the drawer 1. The drawer 1 and the housing 2 may be interlocked by a locking device 3. After unlocking, the drawer 1 is opened under the action of an elastic driving device 4. The elastic driving device 4 may be implemented as a spring.

[0018] The drawer 1 includes a panel 11 and a tray 12 connected to the panel 11. The locking device 3 includes a lock body 31 that is disposed on the tray 12 and that is linearly movable in a second direction Y. The second direction Y is approximately perpendicular to the first direction X. The lock body 31 includes a tongue portion 32 located on an end. The locking device 3 further includes a lock slot 33 that is disposed on the housing 2 and that may accommodate the tongue portion 32 to limit the movement of the drawer. A first spring 34 is compressed to act on the lock body 31 and is located on a side opposite to the tongue portion 32, thereby applying a force to the lock body 31 in a direction that causes the tongue portion 32 to be inserted into the lock slot 33.

[0019] The lock body 31 further includes a first slope 35 inclined relative to a movement direction of the lock body. The panel 11 includes a fixed portion 13 and a moving portion 14 that is movable relative to the fixed portion 13. The fixed portion 13 may be disposed as a frame and the moving portion 14 covers most of the panel 11, so that the panel is visually more integral. Specifically, the moving portion 14 of the panel 11 includes a first surface 140 away from the tray 12, the fixed portion 13 of the panel 11 includes a second surface 130 away from the tray 12, and the area of the first surface 140 is greater than the area of the second surface 130.

[0020] The moving portion 14 includes a push rod 142 extending toward the lock body 31. When the lock body 31 is in a locked position, that is, the tongue portion 32 is located in the lock slot 33, a head portion 143 of the push rod 142 faces and is close to the first slope 35 of the lock body 31. When the lock body 31 is in an unlocked

position, that is, the tongue portion 32 is detached from the lock slot 33 and the first spring 34 releases a thrust to push the lock body 31 to move to a pre-mounting position, the head portion 143 of the push rod 142 is located in a recess 36 at the bottom of the first slope 35. The pre-mounting position can be understood as a position in which the lock body 31 and the first spring 34 are in a stable state after the assembly is completed.

[0021] The tongue portion 32 has a second slope 37 facing a push-in direction of the drawer 1.

[0022] The recess 36 is of a curved-surface concave structure. The head portion 143 of the push rod 142 has a curved-surface convex structure adapted to the recess 36. The fit between the curved-surface convexity and the curved-surface concavity makes the push rod 142 and the lock body 31 have a necessary bonding force so that the tray 12 can be pushed. In addition, when the second slope 37 of the tongue portion 32 is subjected to a force to press the lock body 31 downward, and when the pressure reaches a necessary magnitude, the head portion 143 of the push rod 142 may be detached from the fit with the recess 36, so that the lock body 31 can move back and forth freely.

[0023] The moving portion 14 may move relative to the fixed portion 13 after being pushed, and the movement direction is approximately the same as or similar to an overall movement direction of the drawer 1, that is, the first direction X. A second spring 15 acts on the moving portion 14 to reset the moving portion 14 without being subjected to any external force.

[0024] Therefore, when the lock body 31 is in the locked position, since the head portion 143 of the push rod 142 faces and is close to the first slope 35, a user may push the moving portion 14 to cause the push rod 142 to push the first slope 35 of the lock body 31.

[0025] Under the action of a downward component force, the lock body 31 compresses the first spring 34 and leaves the locked position, driving the tongue portion 32 to exit from the lock slot 33 to implement unlocking. In this case, the drawer 1 is pushed and pulled to the open position by the action of the elastic driving device 4.

[0026] When the lock body 31 is in the unlocked position, the head portion 143 of the push rod 142 is restricted by the recess 36, so that by pushing the moving portion 14 on the panel 11, the lock body 31 and the tray 12 connected to the lock body 31 may be pushed to move along a direction of closing the drawer 1. After the tray 12 is pushed to such an extent that the tongue portion 32 of the lock body 31 is close to the lock slot 33, the second slope 37 of the tongue portion 32 pushes the housing 2. As the housing 2 is fixed, the second slope 37 of the tongue portion 32 slides downward along an edge of the housing 2, so that the lock body 31 moves downward, forcing the head portion 143 of the push rod 142 to be detached from the fit with the recess 36.

[0027] In this case, as the moving portion 14 continues to be subjected to a thrust, after being detached from the recess 36, the head portion 143 of the push rod 142 butts

against the first slope 35. In this case, the lock body 31 is acted upon by both the push rod 142 and the housing 2, to compress the first spring 34 and move downward. When the lock body 31 moves to such an extent that the top of the tongue portion 32 reaches a lower edge of the lock slot 33, the lock body 31 stops moving downward and integrally moves in a push-in direction of the drawer to make the tongue portion 32 enter the lock slot 33. In this case, due to the action of the first spring 34, the lock body 31 moves upward and the tongue portion 32 is inserted into the lock slot 33 to lock the drawer 1.

Claims

1. A washing machine comprising a drawer (1), comprising a housing (2) accommodating the drawer (1), wherein the drawer (1) comprises a panel (11) and a tray (12) connected to the panel (11), a linearly movable lock body (31) is provided on the tray (12), the lock body (31) comprises a tongue portion (32), the housing (2) comprises a lock slot (33) capable of accommodating the tongue portion (32) to restrict movement of the drawer (1), and a first spring (34) acts on the lock body (31) and applies a force to the lock body (31) in a direction that causes the tongue portion (32) to be inserted into the lock slot (33), the lock body (31) further comprises a first slope (35) inclined relative to a movement direction of the lock body (31), the panel (11) comprises a fixed portion (13) and a moving portion (14) movable relative to the fixed portion (13), the moving portion (14) comprises a push rod (142), a head portion (143) of the push rod (142) faces the first slope (35) when the lock body (31) is in a locked position, that is, when the tongue portion (32) is located in the lock slot (33), the tongue portion (32) has a second slope (37) facing a push-in direction of the drawer (1), and wherein the drawer (1) moves back and forth along a first direction (X), the lock body (31) moves along a second direction (Y), and the first direction (X) is approximately perpendicular to the second direction (Y) **characterized in that** the head portion (143) of the push rod (142) is located in a recess (36) at the bottom of the first slope (35) when the lock body (31) is in an unlocked position, that is, when the tongue portion (32) is detached from the lock slot (33) and the first spring (34) releases a thrust to push the lock body (31) to move to a pre-mounting position.
2. The washing machine according to claim 1, **characterized in that** compartments (101, 102) are disposed in the drawer (1) to accommodate a clothing treating agent.
3. The washing machine according to claim 1 or 2, **characterized in that** a second spring (15) applies a pressure to the moving portion (14).

4. The washing machine according to any of claim 1 to 3, **characterized in that** the recess (36) is of a curved-surface concave structure, and the head portion (143) of the push rod (142) has a curved-surface convex structure adapted to the recess (36).
5. The washing machine according to any of claim 1 to 4, **characterized in that** the moving portion moves along a first direction (X).
6. The washing machine according to any of claim 1 to 5, **characterized in that** the moving portion (14) of the panel (11) comprises a first surface (140) away from the tray (12), the fixed portion (13) of the panel (11) comprises a second surface (130) away from the tray (12), and the area of the first surface (140) is greater than the area of the second surface (130).

Patentansprüche

1. Waschmaschine mit einem Einschub (1), einem Gehäuse (2), in dem der Einschub (1) untergebracht ist, wobei der Einschub (1) eine Blende (11) und eine mit der Blende (11) verbundene Schale (12) umfasst, an der Schale (12) ein linear beweglicher Verriegelungsteil (31) vorgesehen ist, der Verriegelungsteil (31) einen Zungenabschnitt (32) umfasst, das Gehäuse (2) einen Verriegelungsschlitz (33) umfasst, der den Zungenabschnitt (32) aufnehmen kann und so die Bewegung des Einschubs (1) begrenzt, und eine erste Feder (34) auf den Verriegelungsteil (31) einwirkt und in einer Richtung, die ein Einführen des Zungenabschnitts (32) in den Verriegelungsschlitz (33) bewirkt, eine Kraft auf den Verriegelungsteil (31) ausübt, wobei der Verriegelungsteil (31) ferner eine erste geneigte Fläche (35) umfasst, die in Bezug auf eine Bewegungsrichtung des Verriegelungsteils (31) geneigt ist, die Blende (11) einen festen Abschnitt (13) und einen in Bezug auf den festen Abschnitt (13) beweglichen Abschnitt (14) umfasst, der bewegliche Abschnitt (14) eine Schubstange (142) umfasst, ein Kopfabschnitt (143) der Schubstange (142) zur ersten geneigten Fläche (35) weist, wenn sich der Verriegelungsteil (31) in verriegelter Position befindet, das heißt, wenn sich der Zungenabschnitt (32) in dem Verriegelungsschlitz (33) befindet, der Zungenabschnitt (32) eine zweite geneigte Fläche (37) aufweist, die in Einschubrichtung des Einschubs (1) weist, und wobei sich der Einschub (1) in einer ersten Richtung (X) vor und zurück bewegt, sich der Verriegelungsteil (31) in einer zweiten Richtung (Y) bewegt und die erste Richtung (X) in etwa senkrecht zur zweiten Richtung (Y) verläuft, **dadurch gekennzeichnet, dass** sich der Kopfabschnitt (143) der Schubstange (142) in einer Ausparung (36) unten an der ersten geneigten Fläche (35) befindet, wenn sich der Verriegelungsteil (31)

in einer unverriegelten Position befindet, das heißt, wenn der Zungenabschnitt (32) von dem Verriegelungsschlitz (33) getrennt ist und die erste Feder (34) eine Schubkraft zum Schieben des Verriegelungsteils (31) in eine Vormontageposition freigibt.

2. Waschmaschine nach Anspruch 1, **dadurch gekennzeichnet, dass** in dem Einschub (1) Fächer (101, 102) für das Aufnehmen eines Wäschebehandlungsmittels angeordnet sind. 10
3. Waschmaschine nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** eine zweite Feder (15) einen Druck auf den beweglichen Abschnitt (14) ausübt. 15
4. Waschmaschine nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die Aussparung (36) eine konkav gekrümmte Flächenkonstruktion und der Kopfabschnitt (143) der Schubstange (142) eine konvex gekrümmte Flächenkonstruktion aufweist, die an die Aussparung (36) angepasst ist. 20
5. Waschmaschine nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** sich der bewegliche Abschnitt in einer ersten Richtung (X) bewegt. 25
6. Waschmaschine nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** der bewegliche Abschnitt (14) der Blende (11) eine von der Schale (12) weg weisende erste Fläche (140) umfasst, der feste Abschnitt (13) der Blende (11) eine von der Schale (12) weg weisende zweite Fläche (130) umfasst und der Flächeninhalt der ersten Fläche (140) größer ist als der der zweiten Fläche (130). 30

Revendications

1. Machine à laver comprenant un tiroir (1), comprenant un boîtier (2) recevant le tiroir (1), dans laquelle : 40
 - le tiroir (1) comprend un panneau (11) et un bac (12) relié au panneau (11),
 - un corps de verrou mobile linéairement (31) est agencé sur le bac (12), 45
 - le corps de verrou (31) comprend une partie de languette (32),
 - le boîtier (2) comprend une fente de verrou (33) capable de recevoir la partie de languette (32) afin d'empêcher le déplacement du tiroir (1), et un premier ressort (34) agit sur le corps de verrou (31) et applique une force sur le corps de verrou (31) dans une direction qui amène la partie de languette (32) à être insérée dans la fente de verrou (33), 50
 - le corps de verrou (31) comprend en outre une première rampe (35) inclinée par rapport à une

direction de déplacement du corps de verrou (31),

le panneau (11) comprend une partie fixe (13) et une partie mobile (14) mobile par rapport à la partie fixe (13),

la partie mobile (14) comprend une tige de poussée (142),

une partie de tête (143) de la tige de poussée (142) est orientée vers la première rampe (35) lorsque le corps de verrou (31) est dans une position verrouillée, c'est-à-dire lorsque la partie de languette (32) est située dans la fente de verrou (33),

la partie de languette (32) comprend une deuxième rampe (37) orientée dans une direction d'enfoncement du tiroir (1), et

dans laquelle le tiroir (1) se déplace dans les deux sens le long d'une première direction (X), le corps de verrou (31) se déplace le long d'une deuxième direction (Y), et la première direction (X) est approximativement perpendiculaire à la deuxième direction (Y),

caractérisée en ce que la partie de tête (143) de la tige de poussée (142) est située dans un creux (36) au bas de la première rampe (35) lorsque le corps de verrou (31) est dans une position déverrouillée, c'est-à-dire lorsque la partie de languette (32) est détachée de la fente de verrou (33) et le premier ressort (34) relâche une force de poussée du corps de verrou (31) pour se déplacer vers une position de pré-montage.

2. Machine à laver selon la revendication 1, **caractérisée en ce que** des compartiments (101, 102) sont disposés dans le tiroir (1) pour recevoir un agent de traitement du linge. 35
3. Machine à laver selon la revendication 1 ou 2, **caractérisée en ce qu'un** deuxième ressort (15) applique une pression sur la partie mobile (14).
4. Machine à laver selon l'une quelconque des revendications 1 à 3, **caractérisée en ce que** le creux (36) est d'une structure concave à surface incurvée, et la partie de tête (143) de la tige de poussée (142) a une structure convexe à surface incurvée adaptée au creux (36).
5. Machine à laver selon l'une quelconque des revendications 1 à 4, **caractérisée en ce que** la partie mobile se déplace le long d'une première direction (X).
6. Machine à laver selon l'une quelconque des revendications 1 à 5, **caractérisée en ce que** la partie mobile (14) du panneau (11) comprend une première surface (140) distante du bac (12), la partie fixe (13)

du panneau (11) comprend une deuxième surface (130) distante du bac (12), et l'aire de la première surface (140) est supérieure à l'aire de la deuxième surface (130).

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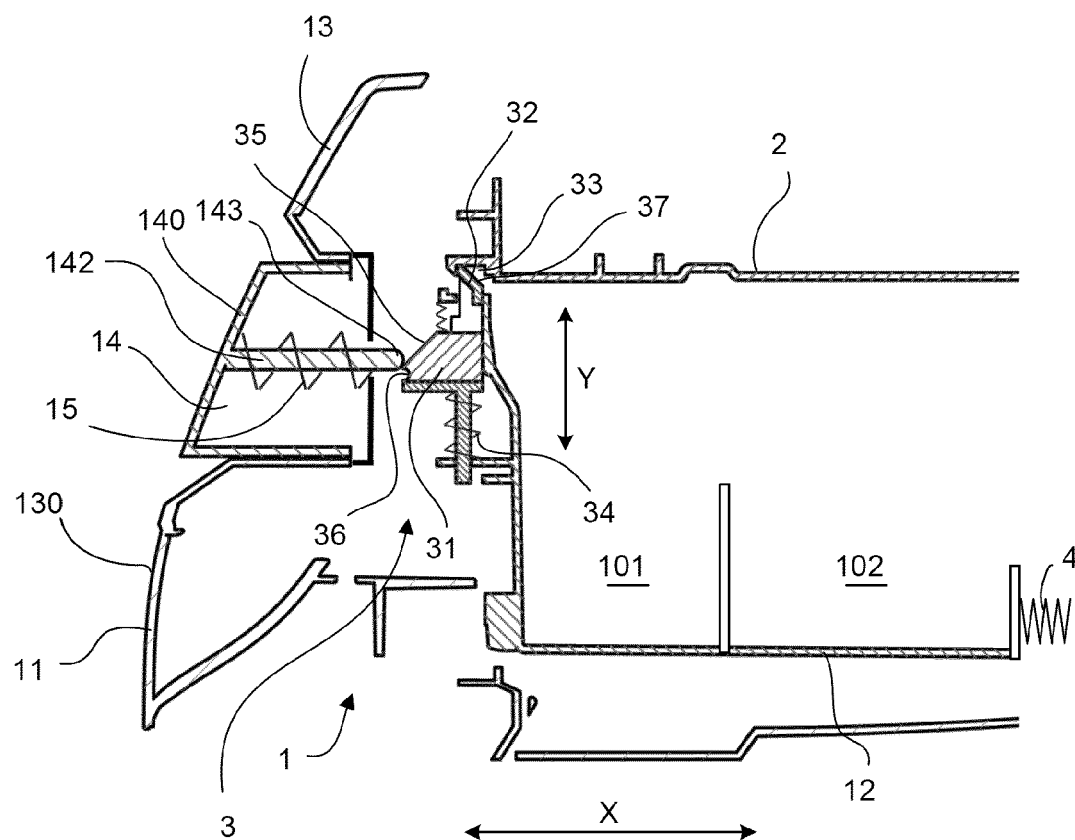


FIG. 1

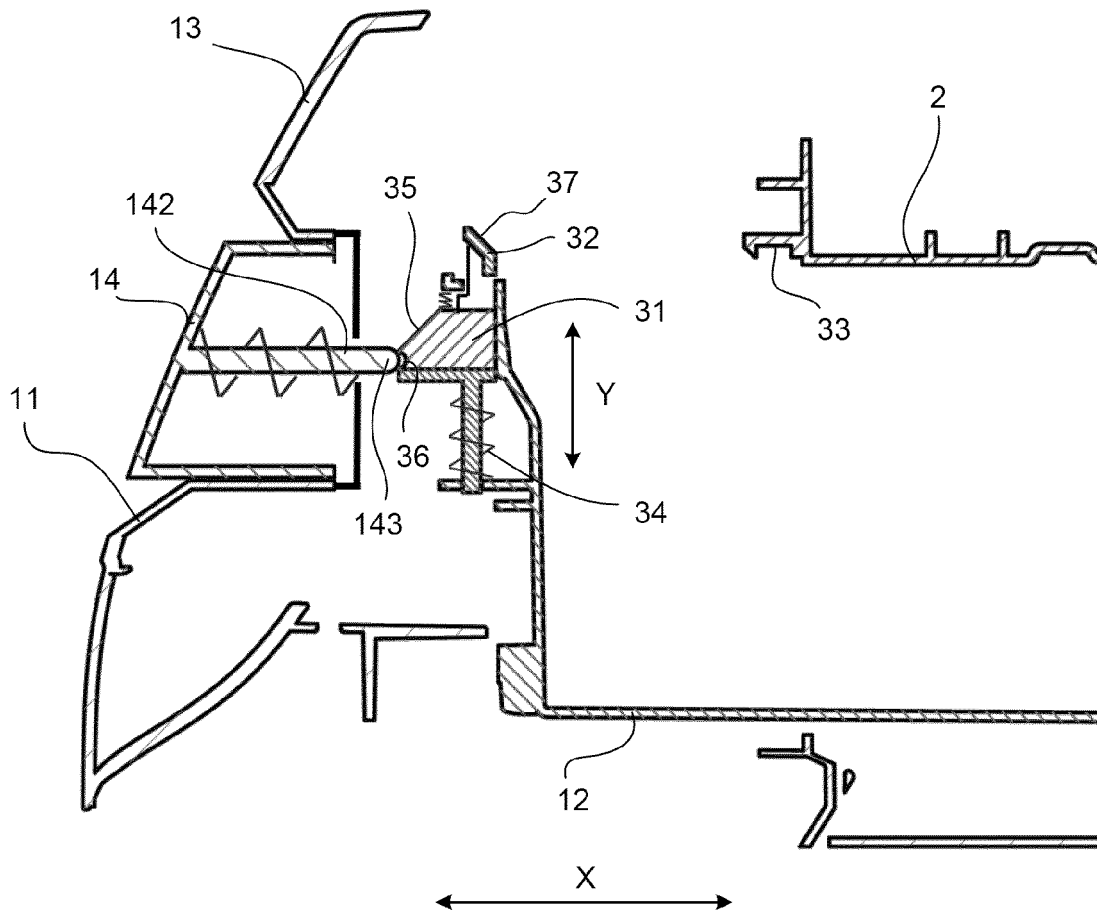


FIG. 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2016140489 A1 **[0004]**