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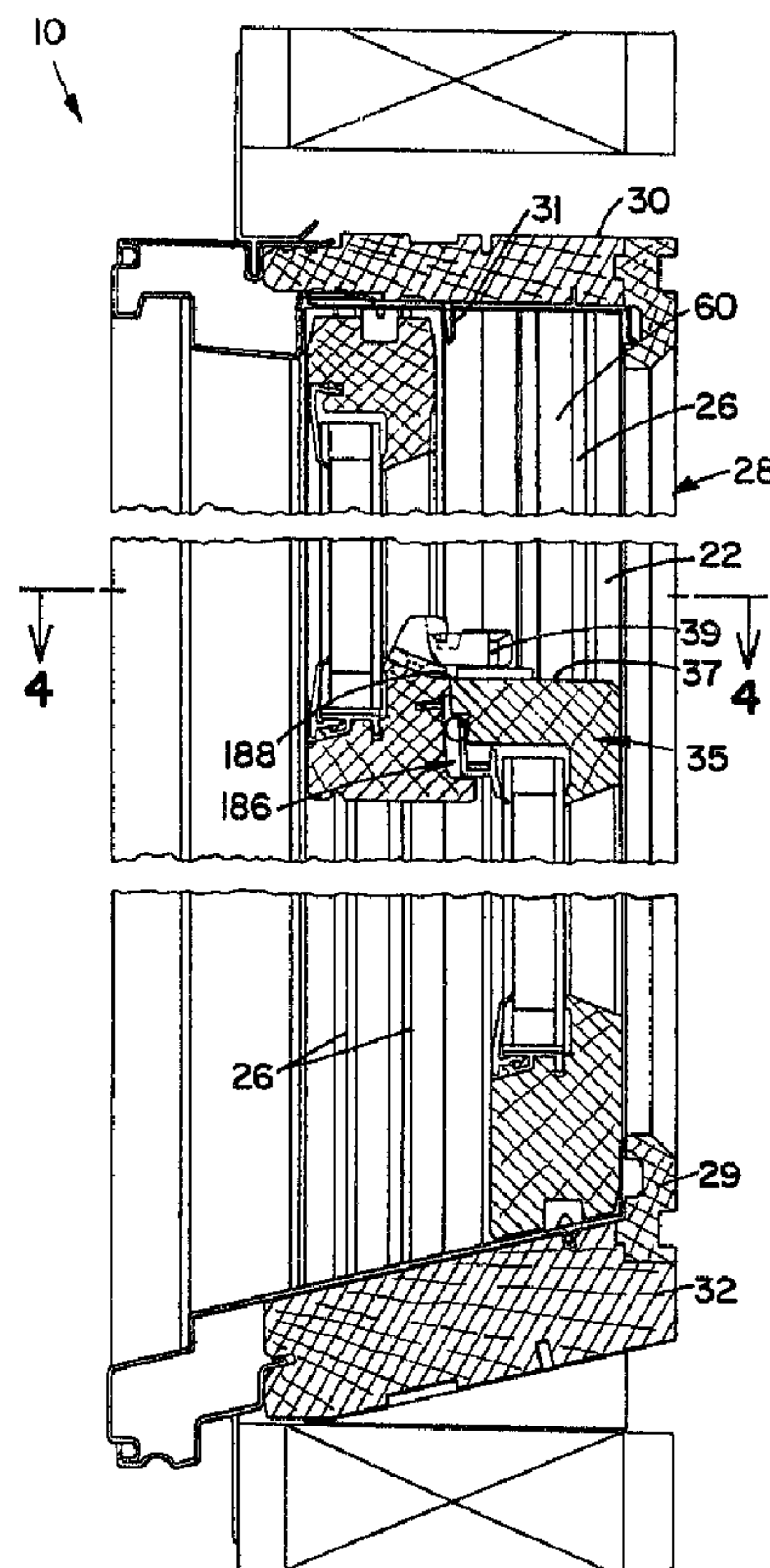
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(54) Titre : SOUPAPE DE DESAERATION A COEFFICIENT DE FROTTEMENT REDUIT ET A L'EPREUVE DE LA
FORMATION DE GIVRE

(54) Title: DOUBLE-HUNG TILTING SASH TYPE WINDOW SYSTEM



(57) Abrégé/Abstract:

A window having a frame with at least two oppositely disposed side members, a top member, and a bottom member. Operably connected to each frame side member is a jamb liner having a front face and at least one jamb channel. Mounted within the

(57) Abrégé(suite)/Abstract(continued):

frame is at least one sash having two oppositely disposed sides. The sash tilts away from the frame for easy cleaning. Within each jamb channel is a locking slide block for slidably and rotatably mounting the sash to the frame. A plough extends from the face of each jamb liner in the direction of the opposite frame side member. Each side of the sash has a sash groove for slidably mounting the sash in the frame by receiving adjacent ploughs. The plough and sash grooves have interlocking edges which engage to resist unintentional tilting of the sash. The jamb liner is mounted for lateral displacement from a first position wherein the plough is engaged with a sash groove to a second position wherein the plough is at least partially retracted from the groove so that the window can be tilted. There is a counterbalance operatively connected to the frame which has a counterbalance tab with an elongated portion having a flange proximate one end for connecting the counterbalance to the locking slide block.

Abstract

A window having a frame with at least two oppositely disposed side members, a top member, and a bottom member. Operably connected to each frame side member is a jamb liner having a front face and at least one jamb channel. Mounted within the frame is at least one sash having two oppositely disposed sides. The sash tilts away from the frame for easy cleaning. Within each jamb channel is a locking slide block for slidably and rotatably mounting the sash to the frame. A plough extends from the face of each jamb liner in the direction of the opposite frame side member. Each side of the sash has a sash groove for slidably mounting the sash in the frame by receiving adjacent ploughs. The plough and sash grooves have interlocking edges which engage to resist unintentional tilting of the sash. The jamb liner is mounted for lateral displacement from a first position wherein the plough is engaged with a sash groove to a second position wherein the plough is at least partially retracted from the groove so that the window can be tilted. There is a counterbalance operatively connected to the frame which has a counterbalance tab with an elongated portion having a flange proximate one end for connecting the counterbalance to the locking slide block.

DOUBLE-HUNG TILTING SASH TYPE WINDOW SYSTEMField of the Invention

This invention generally relates to a tilting
5 sash type window system designed for easy cleaning,
structural integrity, and safety.

Background of the Invention

Double-hung tilting sash type windows have
become increasing popular. Much of this popularity is
10 due to the tilting sash feature which allows both inside
and outside surfaces of the window to be cleaned from
the inside. A reoccurring problem with tilting sash
type windows is how to achieve a tight seal between
window frame and sashes without making it difficult to
15 tilt the sashes. Additionally, the structural integrity
of the window must be maintained at a sufficiently high
level and unexpected motion of the sash must be reduced
to promote safety. In the past, frames have been
equipped with jamb liners having ridges, or ploughs,
20 which extend into grooves in the side of the sashes.

One such configuration is shown in Fig. 2 of
U.S. Patent No. 4,799,333 to Westfall et al. In
Westfall, these ploughs have outwardly disposed sides
approximately perpendicular to the front face of the
25 jamb liner. A similar arrangement is shown in Fig. 5 of
U.S. Patent No. 4,922,657 to Foss. The plough
configuration of the jamb liner disclosed by Westfall et
al. and Foss, however, do not project outwardly to
engage with sashes having grooves with inward
30 projections.

Tilting sash windows have also been equipped
with locking slide blocks, such as the one disclosed in
U.S. Patent No. 4,610,108 to Marshik. Marshik discloses
a double-hung window having a frame with a set of
35 parallel jamb channels on opposite sides of the frame.
Within each jamb channel is a slidably mounted locking
block. A spring counterbalance mechanism is attached to
a plate on each block. A pivot extends from proximate
the lower end of opposite sides of each sash into

locking cams housed within the block. The pivot allows the sash, which holds a window pane, to be rotated or tilted inward. As the pivot rotates, the cam forces serrated ends of a spring into opposite sides of the jamb channel to prevent the counterbalance spring from pulling up the blocks and sash while cleaning.

U.S. Patent No. 4,813,180 to Scalzi discloses another locking sliding block for double-hung windows. Like the '108 patent, a locking block is slidably mounted within jamb channels and a pivot extends from opposite sides of the sash into a pivot button, or cam, in each locking block. Unlike the '108 patent, however, the pivot has a slot which engages a retaining ridge in the pivot button. This is intended to prevent dislocation of the pivots during transport and installation of the window due to deflection or bowing of the frame away from the sash. The locking block disclosed by Scalzi, although allowing the sash to pivot inside for easy cleaning of the window pane, does not allow the window to be conveniently removed from the inside.

Summary of the Invention

The present invention is a design for cleaning tilting sash type windows having an inside and an outside including a frame having at least two oppositely disposed side members, a top member, and a bottom member. Approximately parallel and operably connected to each side member is a jamb liner having a front face and two jamb channels.

The window has two sashes, each with oppositely disposed sides. The sashes are slidably mounted in the frame and have a tilted position and an untilted position. When the sash is in the untilted position, the two sash sides are parallel and proximate opposite side members of the frame.

A plough extends from the face of each jamb liner in the direction of the opposite side member. The

plough has an inside facing side and an outside facing side, wherein the outside facing side has a projecting portion extending generally in the direction of the outside of the window.

5 Each side of the sash has a sash groove for slidably mounting the sash in the frame by receiving adjacent ploughs when the sash is in the untilted position. The groove has a generally inside facing side and a generally outside facing side, wherein the inside
10 facing side has a projecting portion projecting generally in the direction of the inside of the window. The projecting portion of the plough engages with the projecting portion of the groove to resist inward displacement of the sash when the sash is in the
15 untilted position. This is especially important for resisting unwanted tilting by wind force on the outside of the window.

 In order to disengage the ploughs from the sash groove, the jamb liner is mounted for lateral
20 displacement from a first position wherein the plough is engaged with the sash groove to a second position wherein the plough is at least partially retracted from the groove. To move the jamb liner from the first position to the second position, the window has a wash-
25 assist.

 A locking slide block is slidably mounted within each jamb channel for slidably and rotatably mounting the sashes to the frame. The locking slide block has a housing with oppositely disposed sliding
30 surfaces for guiding the housing in the jamb channel. Within the block is a locking spring with serrated ends for selectively engaging oppositely disposed sides of the jamb channel to lock the block in a fixed position. A rotary cam having a rotational axis is carried within
35 the housing of the block. The cam has camming surfaces which come into contact with the locking spring to force

the serrated ends of the locking spring into engagement with the sides of the jamb channel.

One sash pivot is disposed on each lower opposite side of the sashes for operably connecting the sashes to the cam. The pivot has a longitudinal axis. Proximate one end of each pivot are oppositely disposed flanges extending perpendicularly away from the longitudinal axis. The cam has a sash pivot opening with one open top slot for inserting or removing the sash pivot. The cam also has oppositely disposed flanges extending perpendicularly to the cam's rotational axis into the sash pivot opening. When the pivot is in the pivot opening of the cam, the pivot flanges engage the cam flanges so that the pivot cannot be pulled out of the pivot opening in a direction approximately parallel to the longitudinal axis of the pivot.

The locking slide block also has a sash pivot retainer spring having a first end operably connected to the housing and a free end proximate the cam. The spring has a depressible first position for allowing the sash pivot to be inserted or removed from the sash pivot opening through the open top slot. The spring also has a second and normal position for preventing removal of the sash pivot through the open top slot.

A counterbalance is operably connected to jamb liner. The counterbalance has a counterbalance tab which includes an elongated portion having a flange proximate the end opposite the counterbalance for connecting the counterbalance to the sliding locking block.

4a

In one aspect the present invention provides a locking slide block for slidably and pivotally mounting a window sash to a side member of a window frame having a vertical jamb channel, the slide block comprising:

- (a) a housing having oppositely disposed sliding surfaces for guiding the housing in the jamb channel;
- (b) locking means adapted for selectively engaging the jamb channel and locking the block in a fixed position;
- (c) a cam carried in the housing, the cam having camming surfaces to come in contact with the locking means to operate the locking means;
- (d) a sash pivot, the pivot operatively connected to the sash and to the cam;
- (e) the cam having a sash pivot opening, the opening having an open top slot; and
- (f) a sash pivot retainer spring, the spring having a first end operatively connected to the housing and a free second end proximate the sash pivot opening, the second end having a depressible, first position for allowing the sash pivot to be inserted or removed from the sash pivot opening through the open top slot and a normal, second position at least partially covering the open top slot for preventing removal of the sash pivot through the open top slot.

In another aspect the present invention provides a locking slide block for slidably and pivotally mounting a window sash to a side member of a window frame having a vertical jamb channel, the slide block comprising:

- (a) a housing defining oppositely disposed sliding surfaces for guiding the housing in the jamb channel;
- (b) locking means adapted for selectively engaging the jamb channel and locking the block in a fixed position;
- (c) a cam carried in the housing, the cam having camming surfaces to come to contact with the locking means to operate the locking means;
- (d) a sash pivot, having a longitudinal axis, the pivot operatively connected to the sash and to the cam, the

4b

sash pivot having two flanges, at one end of an elongated portion of the pivot, oppositely and outwardly disposed from the longitudinal axis of the pivot;

(e) the cam having a sash pivot opening, the opening having an open top slot;

(f) the open top slot defined by a bottom a first side and a second side, the sides each having a cam flange; so that the elongated portion of the pivot can be inserted into the open top slot, and the flanges of the pivot engage with the cam flanges to prevent the pivot from being pulled out of the pivot opening in a direction approximately parallel to the longitudinal axis of the elongated portion of the pivot; and

(g) a sash pivot retainer spring, the spring having a first end operably connected to the housing and a free second end proximate the sash pivot opening, the second end having a depressible, first position for allowing the sash pivot to be inserted or removed from the sash pivot opening through the open top slot and a normal, second position at least partially covering the open top slot for preventing removal of the sash pivot through the open top slot.

These advantages and other objectives obtained with this invention are further explained hereinafter with more particularity and by reference to the preferred embodiment as shown in the following drawings.

Brief Description of the Drawings

Fig. 1 shows a perspective view of the window in accordance with the present invention;

Fig. 2 shows a vertical cross-section of the window in accordance with the present invention;

Fig. 3 shows a perspective view of a check rail liner pad;

Fig. 4 shows a partial horizontal cross-section of the window;

Fig. 5 shows a partial horizontal cross-section showing an alternative embodiment of the window;

Fig. 6 is a perspective view of a side member with jamb channel and wash-assist ramp;

Fig. 7A shows a perspective view of the wash-assist ramp;

Fig. 7B shows an end view of the wash-assist ramp;

Fig. 7C shows a side view of the wash-assist ramp;

Fig. 8 shows a perspective view of the side member and jamb liner with a hooked wash-assist;

Fig. 9 shows a perspective view of the hooked wash-assist;

Fig. 10 shows a perspective view of the side member and jamb channel and a camming wash-assist;

Fig. 11 shows a perspective view of the camming wash-assist;

Fig. 12 shows a perspective view of the side member and jamb channel and a biased wash-assist ramp;

Fig. 13A shows a perspective view of the biased wash-assist ramp;

Fig. 13B shows a side view of the biased wash-assist ramp;

Fig. 14 shows an exploded perspective view of a sliding locking block with a pivot;

Fig. 15 shows the assembled sliding locking block without pivot;

