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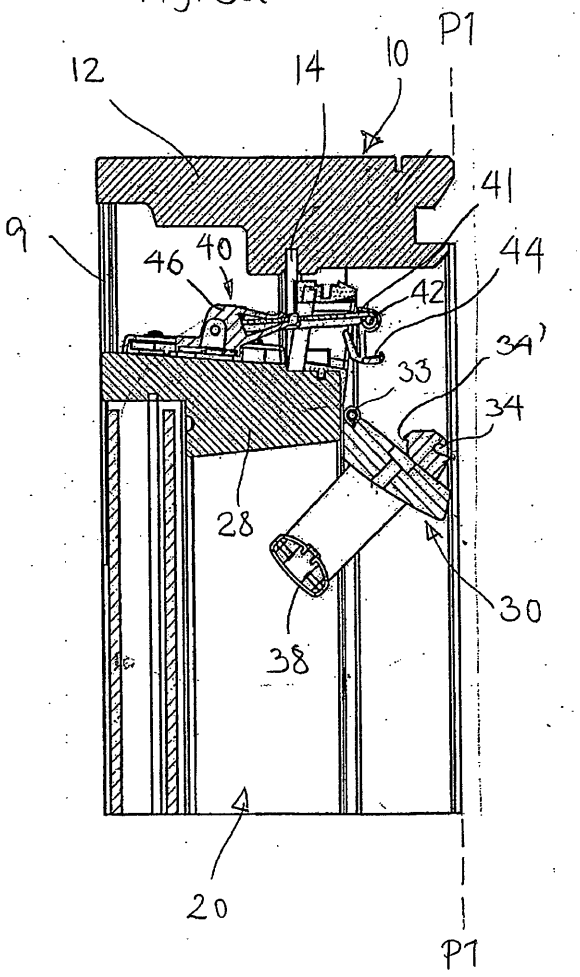
(54) Window assembly with snap-on handle, and a method for transporting the window assembly

(57) A window assembly (1) for mounting in a building structure, said assembly (1) including:
- a window sash (20) pivotally mounted to a window frame (10),
- a ventilation opening (9) suitable for air ventilation of said building structure,
- a ventilation opening flap (30) connected with said sash (20) or said frame (10) and being pivotally movable between a closed position wherein said flap (30) blocks said ventilation opening (9) and an open position wherein said ventilation opening (9) is unblocked,
- said flap (30) including a structural part (38), such as a handle, projecting outwards from said frame (10) in said open and closed positions, said flap (30) connected with said sash (20) or said frame (10) being movable to said open or closed position from a first position wherein said structural part (38) projects less from said frame (10).

Fig. 3a



EP 2 565 355 A2

Description

FIELD OF THE DISCLOSURE

[0001] The present disclosure relates to a window assembly with a sash arranged to be openable with respect to a window frame by pivotal movement about a pivot axis parallel to a pair of opposed sash members and a movable ventilation shutter or flap registering with a ventilation opening in a closed position of the flap and not registering with the ventilation opening in an open position of the ventilation flap.

BACKGROUND OF THE DISCLOSURE

[0002] WO 2007/071262 discloses a ventilating window having a sash arranged to be openable with respect to a window frame by pivotal movement about an axis parallel to a pair of opposed sash members. A ventilation shutter or flap with a handle or control bar is pivotally connected to the sash and registers in a closed position with a ventilation opening of a ventilation path through the sash. In an open position the flap does not register with the ventilation opening and allows passage of air through the ventilation channel. A lock is mounted in the ventilation opening and has a link connected to one side of the flap opposite the handle. The link operatively connects the flap to the lock. The lock is part of a lock assembly that comprises a striking plate fixed to a window frame member opposite one of the pair of sash members and a housing of the lock is fixed to one sash member opposite the striking plate.

SUMMARY OF THE INVENTION

[0003] With the prior art assemblies the ventilation flap with the handle has normally been located within an outline defined by the frame, in a position ready for use, and assembly makers have not been concerned about particular packaging problems, other than perhaps to protect a window pane already installed at the factory.

[0004] The prior art assemblies are typically designed with the handle projecting outwards from the sash to allow a person to get a firm grip on the handle for manipulating the flap. As the prior art window assemblies are currently being developed into units with handles that project from the frame outline problems will arise in respect to the packaging and transporting of the assemblies from the production facility to the building structure where the assembly is to be installed, because the projecting handle increases the risk of damage to the handle or to the rest of the window assembly. Either the packaging must be designed to accommodate for any structural parts of the handle projecting beyond the aforementioned outline of the window frame, or special care must be taken when several non-packaged assemblies are placed next to each other, e.g. during temporary storage at the building site, to avoid the risk that the handle bar causes damage to the adjacent window assembly.

[0005] It is an object of the present disclosure to solve or at least reduce these problems and to also provide an assembly that is easier to transport and to package, if necessary.

[0006] To solve or at least reduce these problems the present invention provides a window assembly for mounting in a building structure and including a window sash pivotally mounted to a window frame, a ventilation opening suitable for air ventilation of the building structure, a ventilation opening flap connected with the sash or the frame and being pivotally movable between a closed position wherein the flap blocks the ventilation opening and an open position wherein the flap uncovers or opens the ventilation opening, the ventilation flap including a structural part projecting outwards from the frame in one or both of the open or closed positions, the ventilation flap connected to the sash or the frame being movable to the open position from a first or transport position wherein the structural part does not project from the frame.

[0007] According to one preferred embodiment a lock for locking the sash to the frame is operatively connected with the flap in the open and closed positions for controlling the lock by pivotal movement of the flap. Preferably, there is no connection between the flap and the lock in the first position of the flap.

[0008] The invention also relates to a method wherein the window assembly is first transported to the building structure, with the flap connected with sash or the frame being in the first position, and wherein the flap is then pivotally moved to the open or closed position; preferably, only at that point of time at the site of the building structure is the flap brought into operable connection with the lock. Preferably, the sash is locked to the frame by the lock before the transporting, and remains locked at least until delivery of the assembly at the site of the building structure.

[0009] According to one aspect of the invention an assembly is provided, the assembly including a window sash pivotally mounted to a window frame, a ventilation opening suitable for air ventilation of a building structure, a ventilation flap connected with the sash or frame and being pivotally movable between a closed position wherein the flap blocks the ventilation opening and an open position wherein the ventilation opening is unblocked, the flap including a main body with a handle for manual operation of the flap, the handle projecting outwards from the frame in the open and closed positions, wherein the main body has a first engagement structure and the handle including a second engagement structure complementary with the first engagement structure, the first and second engagement structures being adapted to engage each other by snap action.

[0010] The present application also discloses a method for transporting a window assembly provided with a window frame, a sash pivotally mounted to the window frame, a ventilation opening and a pivotally suspended

ventilation flap that can be operatively connected to a lock that is configured to lock and unlock in the sash to the window frame, comprising: positioning the ventilation flap in a transport position in which the ventilation flap is not operatively connected to the lock and in which the ventilation flap does not protrude from the outline of the window frame during transport, and moving the ventilation flap from the transport position to an operating position in which the ventilation flap projects from the outline of the window frame and automatically connecting the ventilating flap operatively to the lock when ventilation flap is moved from the transport position to the operating position.

[0011] The present application also discloses a novel window assembly for mounting in a building structure and including a window sash pivotally mounted to a window frame, a ventilation opening suitable for air ventilation of the building structure, a ventilation flap connected with the sash or frame and being pivotally movable between a closed position wherein the flap blocks the ventilation opening and an open position wherein the ventilation opening is unblocked, a lock for locking the sash to the frame being operatively connected with the flap in the open and closed positions for controlling the lock by pivotal movement of the flap, the lock including a lock control base structure mounted to the sash, and a link member connected with the base structure, the link member being connected with the flap for the controlling of the lock, the lock including a resilient support for support of the link member. This structure is of particular advantage in that the resilient support may dampen or limit vibrations of the link member.

[0012] Further objects, features, advantages and properties of the window assembly and method according to according to the disclosure will become apparent from the detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] In the following detailed portion of the present description, the disclosure will be explained in more detail with reference to the exemplary embodiments shown in the drawings, in which:

Fig. 1 shows a window assembly according to an exemplary embodiment of the present disclosure in an open position,

Fig. 2 shows the window assembly in a closed position, as seen from the inside of a building structure,

Figs. 3a-3c are sectional views through the upper part of the window assembly, showing the flap in various positions,

Fig. 4 is a cross-sectional view of an alternative exemplary embodiment of a ventilation flap,

Fig. 5 is a perspective view of the ventilation flap of fig. 4, seen from one side,

Fig. 6 is a perspective view of the ventilation flap of Fig. 4, seen from another side,

Fig. 7a-d are sectional views through the upper part of an alternative embodiment of the window assembly, showing the flap in various positions, and

Fig. 8 is a schematic cross-sectional view of another aspect of the present disclosure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] Fig. 1 schematically shows an exemplary embodiment of a window assembly 1 including a frame 10 with an upper frame member 12 and a sash 20, the sash 20 having a window pane 5 framed by sash members 22, 24, 28 and being arranged to be openable with respect to the frame 10 by pivotal movement about a pivot axis parallel to a pair of opposed sash members 22, 28. In Fig. 1 the sash 20 is shown in an open position. The window assembly 1 can be used as a roof window or skylight.

[0015] When the sash 20 is in a closed position as shown in fig. 2 ventilation is still possible through a ventilation path in the top of the assembly 1, the end opening of the ventilation path designated numeral 9 in fig. 2. A cover that prevents rain water from entering the ventilation path is arranged on the outside of the assembly not visible in fig. 2. On the side facing the interior of the building is provided a ventilation flap 30 for selectively blocking and unblocking the ventilation path opening 9. The ventilation flap 30 is pivotally connected with the sash 20 and can be turned manually by means of a handle bar 38 between several operative positions such a closed position blocking the ventilation path opening 9, an open position unblocking the ventilation path opening 9, and a further position unlocking a lock for locking the sash 20 to the frame 10.

[0016] Figures 3a, 3b and 3c are sectional views through the upper area of a first exemplary embodiment of the assembly 1. Parts of a lock for locking the sash 20 to the frame 10 are indicated broadly by reference numeral 40; the lock 40 includes one or more movable locking pawls 45 (see fig. 6) adapted to engage a striking plate (not shown) mounted on the window frame member 12.

[0017] The ventilation flap or flap 30 with handle bar 38 is shown in fig. 3a in a first or transport position wherein the flap 30 is joined to the remaining parts of the assembly 1 only through a pivotal connection or hinge 33 with frame member 28 of sash 20; with the assembly 1 being in an upright position as shown, the flap 30 will hang freely and assume a transport position shown in fig. 3a. In this transport position of the flap 30 the assembly 1 allows for an easy transport from factory to building site as there are no structural parts projecting beyond the imaginary plane P1 defined by the outer faces of the members 12 of the frame 20 on the side of the frame 20 where the ventilation flap 30 is provided. This involves the advantage that a plurality of identical assemblies 1 may me placed closely against each other, and also that the assembly may be

packaged in a convenient manner in a package which needs to be designed only to accommodate for the contour of the frame 20 of the assembly 1.

[0018] Fig. 3b shows the assembly 1 after transport and just before or after installation in a building structure (not shown) with the flap 30 having after the transport been connected with the lock 40, and assuming a position wherein in a well-known manner a user holding on to the handle bar 38 may control the lock 40 by turning the flap anti-clockwise around the pivotal connection 33. A lever arm 44 of the lock 40 forms an additional connection between the lock 40 and the flap 30.

[0019] Fig. 3c shows the flap 30 in a closed position that a user may select during daily use of the window assembly 1 when mounted in a building structure and wherein the sash 20 is at the same time locked to the frame 10 by the lock 40. By turning the flap 30 clockwise from the position shown in fig. 3c and into a predetermined end position wherein the flap 30 still remains fully connected with the lock 40 the user may unlock the sash 20 from the frame 10, allowing the sash 20 to be turned into a position as shown in fig. 1. The clockwise turning of the flap 30 also results in the flap 30 being moved away from its position in front of the ventilation opening 9 which is thereby unblocked/uncovered.

[0020] More specifically, the flap 30 has a main body 32 adapted to block the ventilation path opening 9 in the position referred to herein as its closed position (see also fig. 6), thereby preventing passage of air through the ventilation path. The handle bar 38 is connected to a front side of the main body 32.

[0021] As seen better in fig. 6, on the rear side of the main body 32 is generally provided a portion or recess 34 for pivotally receiving a mating end of a link member 41 that is a part of the lock 40 and pivotally connected to the base structure 43 of the lock 40, at the same time as a projection 34' on the main body 32 qets in snap-engagement with an end of the lever arm 44. The link member 41 operatively connects the main body 32 of the flap 30 to the remaining parts of the lock 40 to allow a person to control the lock 40. Turning the flap 30 clockwise or anti-clockwise pulls or pushes the link member 41 into selected positions. Comparing fig. 4 with fig. 6 it can be seen how a pawl 45 of the lock 40 connected to the link member 41 thereby assumes different positions as the link member 41 is moved by the flap 30. In the position shown in fig. 6 the pawl 45 engages a striking plate (not shown) on the frame 10, thereby locking the sash 20 to the frame 10.

[0022] In figs. 3a-3c the lock 40 has a resilient support 46 for flexibly supporting the link member 41 in a predetermined position. Through proper choice of material and design of the resilient support 46 the end of the link member 41 is held in a position with its free end aligned with the mating portion or recess 34 of the main body 32, ready for establishing the pivotal connection with the flap 30 when the worker installing the assembly 1 turns the flap 30 anti-clockwise from the position shown in fig. 3a. The resilient support allows for a pivotal movement of the link member 41 with respect to the base structure 43 during normal operation of the flap, and the resilience is such as to dampen or limit vibrations of the link member 41 which the support 46 bears against. This allows for a smooth feeling when a person operates the flap 30, and also reduces any rattling noise during movement of the flap 30. As shown, the resilient support 46 may be formed as a plastic material bracket fixed to the base structure 43 and receiving the metal link member 41 in a space between two bracket arms 46', 46" and providing a clamping force on the link member 41. As the distal end of the link member 41 turns up and down during manipulation of the flap the arms 46', 46" will bend elastically with a continuous grip on the link member 41.

[0023] In the alternative embodiment shown in figs. 4-7 the flap 30 includes a flexible projecting member 36 adapted to act on a bottom side of the link member 41 when the flap 30 is moved from the first position shown in fig. 4, to move the link member 41 into a position ready for establishing pivotal connection with the flap 30 when the worker installing the assembly 1 turns the flap 30 clockwise from the position shown in fig. 4. Fig. 5 shows how the projecting member 36 extends below the link member 41; the flexibility allows the flexible member 36 to change its configuration from that shown in fig. 5 to that of fig. 6. It is noted that two or more lock mechanisms may be used in one window and that the disclosed flap may engage two or more lock mechanisms when initially moved to the closed position. Engagement of two or more lock links is hereby completed in one action.

[0024] In figs. 7a-7d the frame 20 is not shown; fig. 7a shows the flap 30 in the first position while fig. 7b shows the ventilation flap 30 in an end-position where the sash 20 is unlocked from the frame, the ventilation opening 9 being uncovered. In fig. 7c the flap 30 is the open and intermediate position wherein the ventilation opening 9 is uncovered while the sash 20 is locked to the frame 10 while in fig. 7d the flap 20 is in the closed position, the sash 20 being locked to the frame 10. It is noted that the handle 38 is not shown in figs. 4-7.

[0025] It will be understood from the foregoing that the flap 30 is intended to assume the first position shown in fig. 3a and 7a when the assembly 1 is to be transported from the manufacturing site to the site of the building structure where the assembly 1 is to be mounted. After installation the workman will turn the flap to the position shown in fig. 3b, and the flap 30 will normally never again be returned to the first position, except if the roof window needs service, such as replacement of a flap gasket.

[0026] In fig. 8 is shown another embodiment wherein the main body 32 of the flap 30, and the handle 38 that projects outwards from the frame 10 in the open and closed positions, have a first engagement structure (31') and a second engagement structure (31"), respectively, the engagement structures being complementary with each other and adapted to engage each other by snap action for connecting the handle 38 with the main body

32. In the shown embodiment the second engagement structure 31" is arranged on distal ends of leg portions 38' extending from a handle bar portion of the handle 38. The assembly 1 is in this embodiment transported to the site of the building structure with the projecting handle 38 packaged separately, the builder being required to simply engage the handle 38 with the main body 32 of the flap 30 after the window assembly 1 has been installed.

[0027] The term "comprising" as used in the claims does not exclude other elements or steps. The term "a" or "an" as used in the claims does not exclude a plurality. The single processor or other unit may fulfill the functions of several means recited in the claims.

[0028] The reference signs used in the claims shall not be construed as limiting the scope.

[0029] Although the present invention has been described in detail for purpose of illustration, it is understood that such detail is solely for that purpose, and variations can be made therein by those skilled in the art without departing from the scope of the invention.

Claims

1. A window assembly (1) for mounting in a building structure, said assembly (1) including:

- a window sash (20) pivotally mounted to a window frame (10),
- a ventilation opening (9) suitable for air ventilation of said building structure,
- a ventilation flap (30) connected with said sash (20) or said frame (10) and being pivotally movable between a closed position wherein said flap (30) blocks said ventilation opening (9) and an open position wherein said ventilation opening (9) is unblocked,
- said flap (30) including a structural part (38) projecting outwards from said frame (10) in said open and closed positions, said flap (30) connected with said sash (20) or said frame (10) being movable to said open or closed position from a first position wherein said structural part (38) projects less from said frame (10).

2. The window assembly of claim 1, wherein said structural part (38) does not project from said frame (10) in said first position.

3. The window assembly of claim 1 or 2, wherein in said open and closed positions said structural part projects beyond an imaginary plane (P1) defined by the outer faces of members (12) of said frame (20) on the side of said frame (20) where said ventilation flap (30) is provided, and wherein said structural part (38) does not project beyond said plane (P1) in said first position.

4. The window assembly according to any one of the preceding claims, wherein said structural part (38) is in said first position at least partially received between structural members (22, 24, 28) defining said sash (20).

5. The window assembly according to any one of the preceding claims, wherein said structural part (38) is a handle to be manually engaged by a person for moving said flap (30) between said open and closed positions.

6. The window assembly according to any one of the preceding claims, wherein a lock (40) for locking said sash (20) to said frame (10) is operatively connected with said flap (30) in said open and closed positions for controlling said lock (40) by pivotal movement of said flap (30).

7. The window assembly according to the preceding claim, wherein no connection is established between said flap (30) and said lock (40) in said first position of said flap (30).

8. The window assembly according to claim 6 or 7, said lock (40) including a lock control base structure (43) mounted to said sash (20), and a link member (41) connected with said base structure (43), said link member (41) being connected with said flap (30) for said controlling of said lock (40).

9. The window assembly according to the preceding claim, said flap (30) including a flexible projecting member (36) facing said link member (41) and adapted to act on said link member (41) when said flap (30) is being moved from said first position, to align said link member (41) with a mating portion (34) on said flap (30) in a position ready to establish said connection with said flap (30).

10. The window assembly according to claim 8, said lock (40) including a resilient support (46) for support of said link member (41) in a position aligned with a mating portion (34) on said flap (30) in a position ready to establish said connection with said flap (30).

11. The window assembly according to the preceding claim, said resilient support allowing a pivotal movement of said link member (41) with respect to said base structure (43), the resilience being such as to dampen or limit vibrations of said link member (41).

12. The window assembly according to the preceding claim, said resilient support being formed as a bracket receiving said link member (41) and providing a clamping force on said link member (41).

13. The window assembly according to any one of the

preceding claims 6-12, wherein said sash (20) is locked to said frame (10) by said lock (40) in said closed and open positions of said flap, said flap (30) operatively connected with said lock (40) being further pivotally movable into an unlock position to unlock said sash (20) from said frame (10).

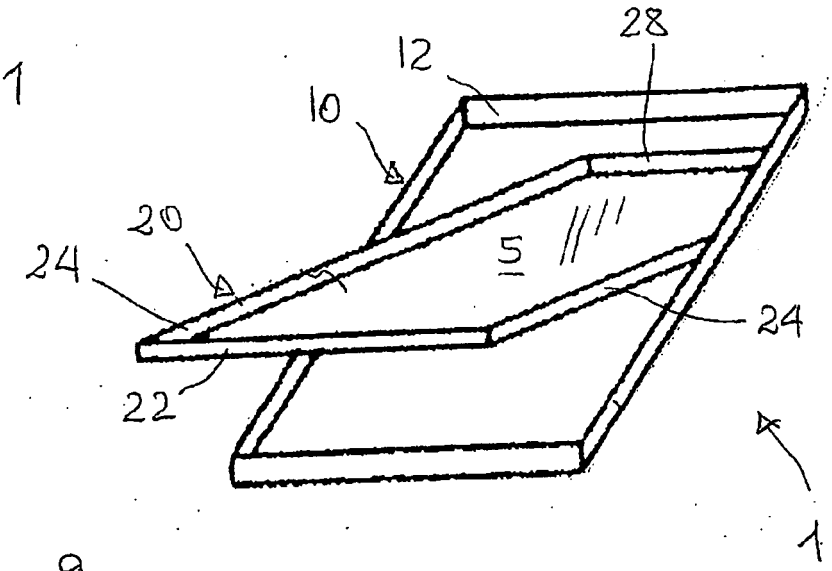
14. The window assembly according to any one of the preceding claims, said sash (20) including a window pane (5), said structural part (38) being relatively closer to said window pane (5) in said first position than in said open and closed positions.

15. The window assembly according to any one of the preceding claims, said flap (30) being pivotally connected to said sash (20), said ventilation opening (9) being formed in said sash (20).

16. A method for transporting a window assembly (1) provided with a window frame (10), a sash (20) pivotally mounted to said window frame, a ventilation opening (9) and a pivotally suspended ventilation flap (30) that can be operatively connected to a lock (40) that is configured to lock and unlock in the sash (20) to the window frame (10), comprising:

positioning said ventilation flap (30) in a transport position in which the ventilation flap (30) is not operatively connected to said lock (40) and in which the ventilation flap does not protrude from the outline of the window frame during transport, and
moving said ventilation flap (30) from said transport position to an operating position in which said ventilation flap (30) projects from the outline of said window frame (10) and automatically connecting the ventilating flap (30) operatively to said lock (40) when ventilation flap (30) is moved from said transport position to said operating position.

Fig. 1



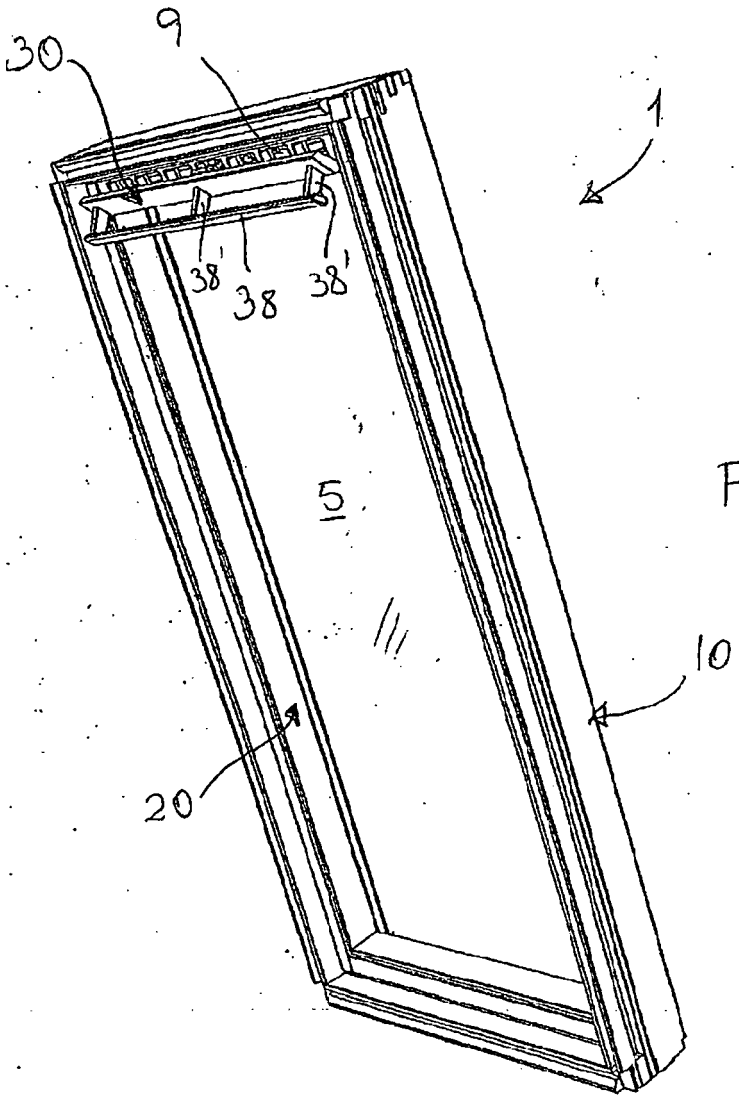
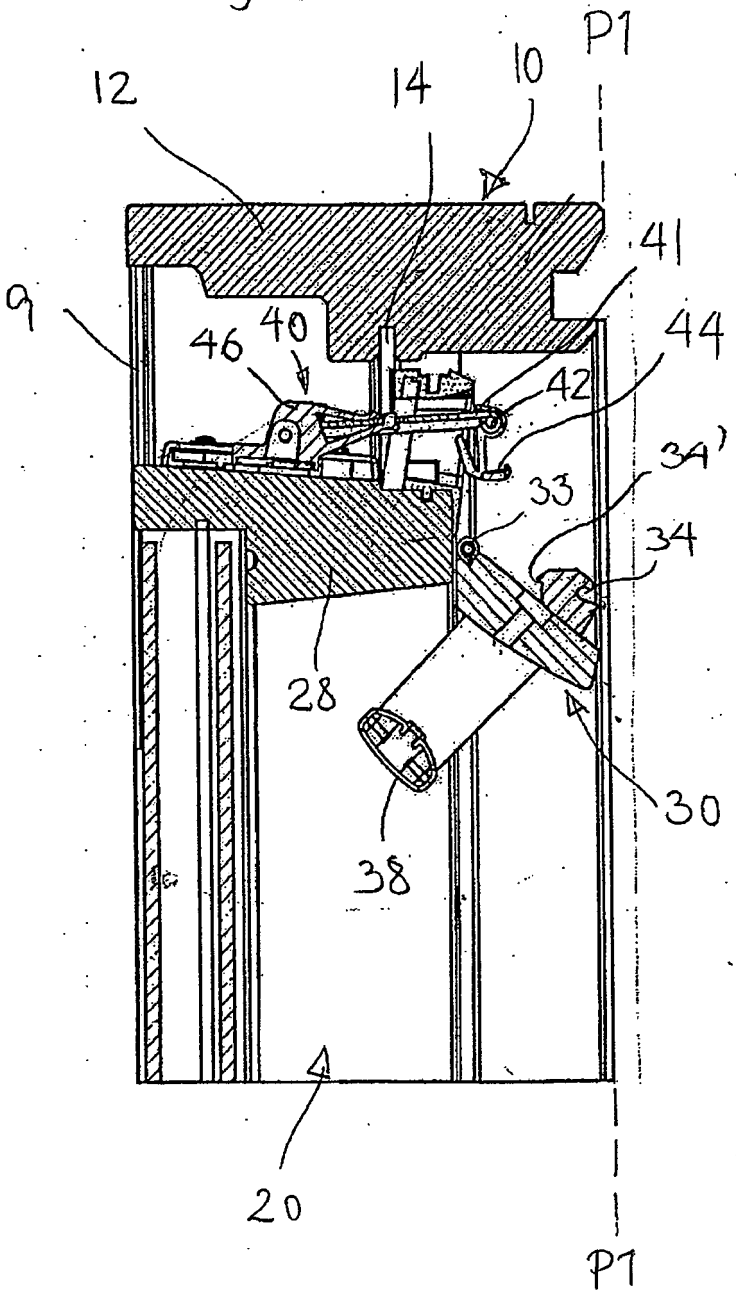


Fig. 2

Fig. 3a



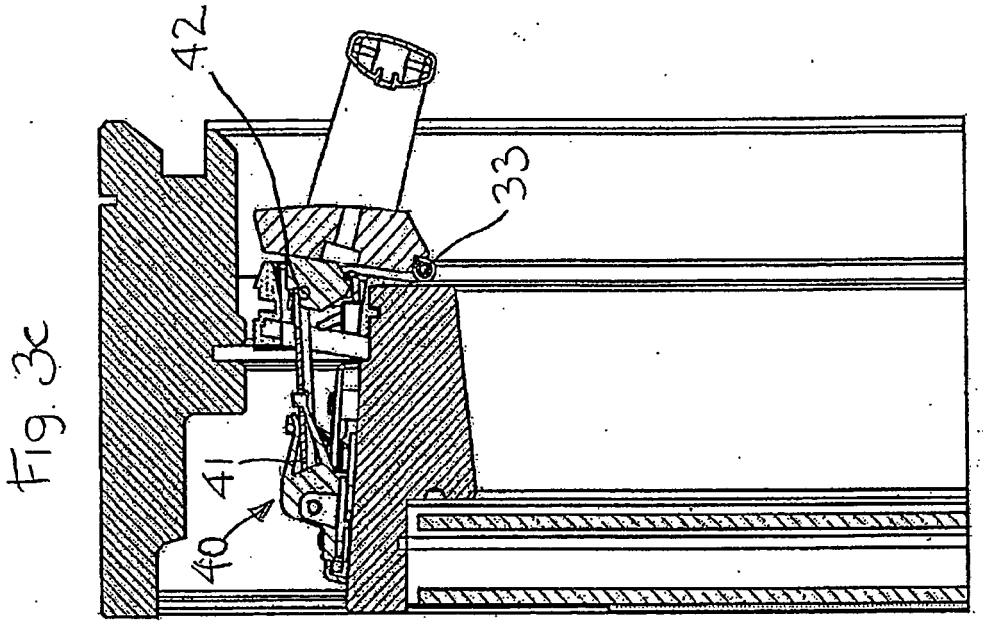


Fig. 3c

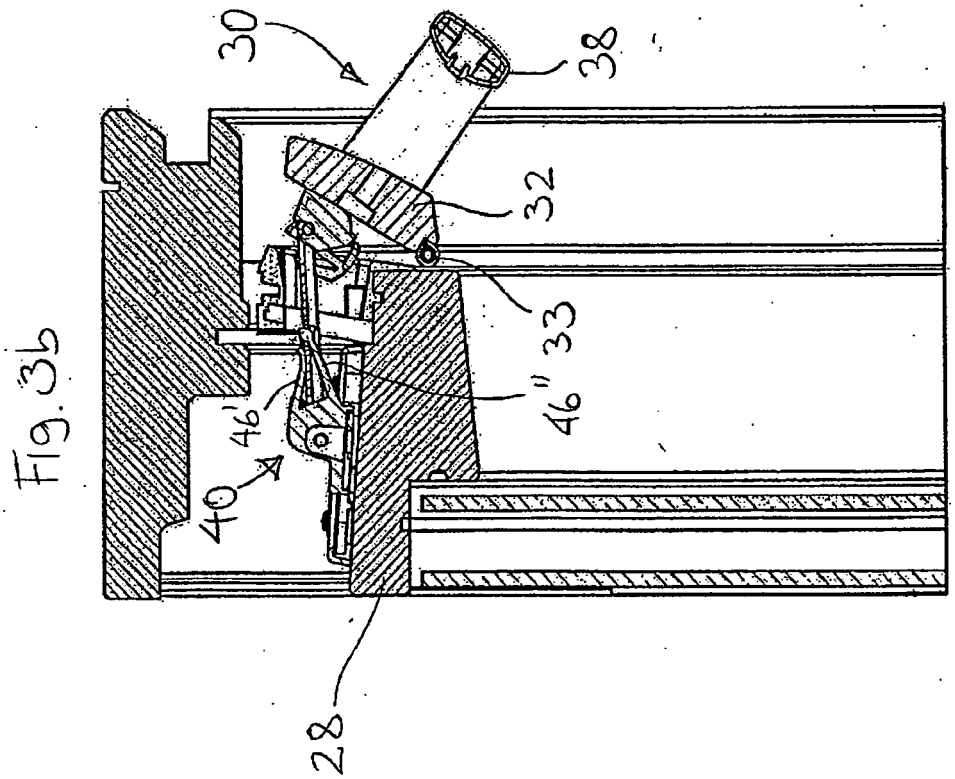


Fig. 3b

Fig. 4

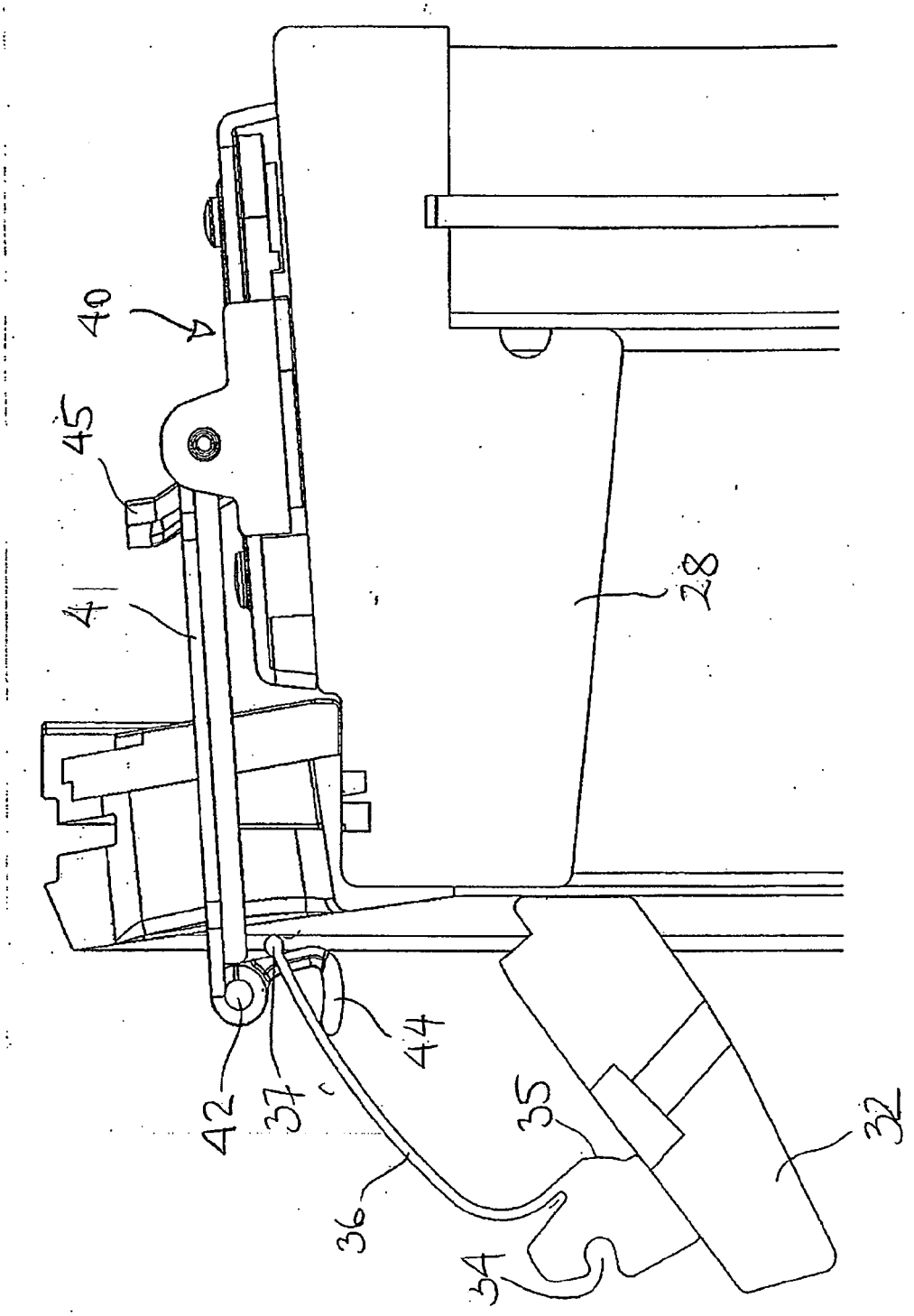


Fig. 5

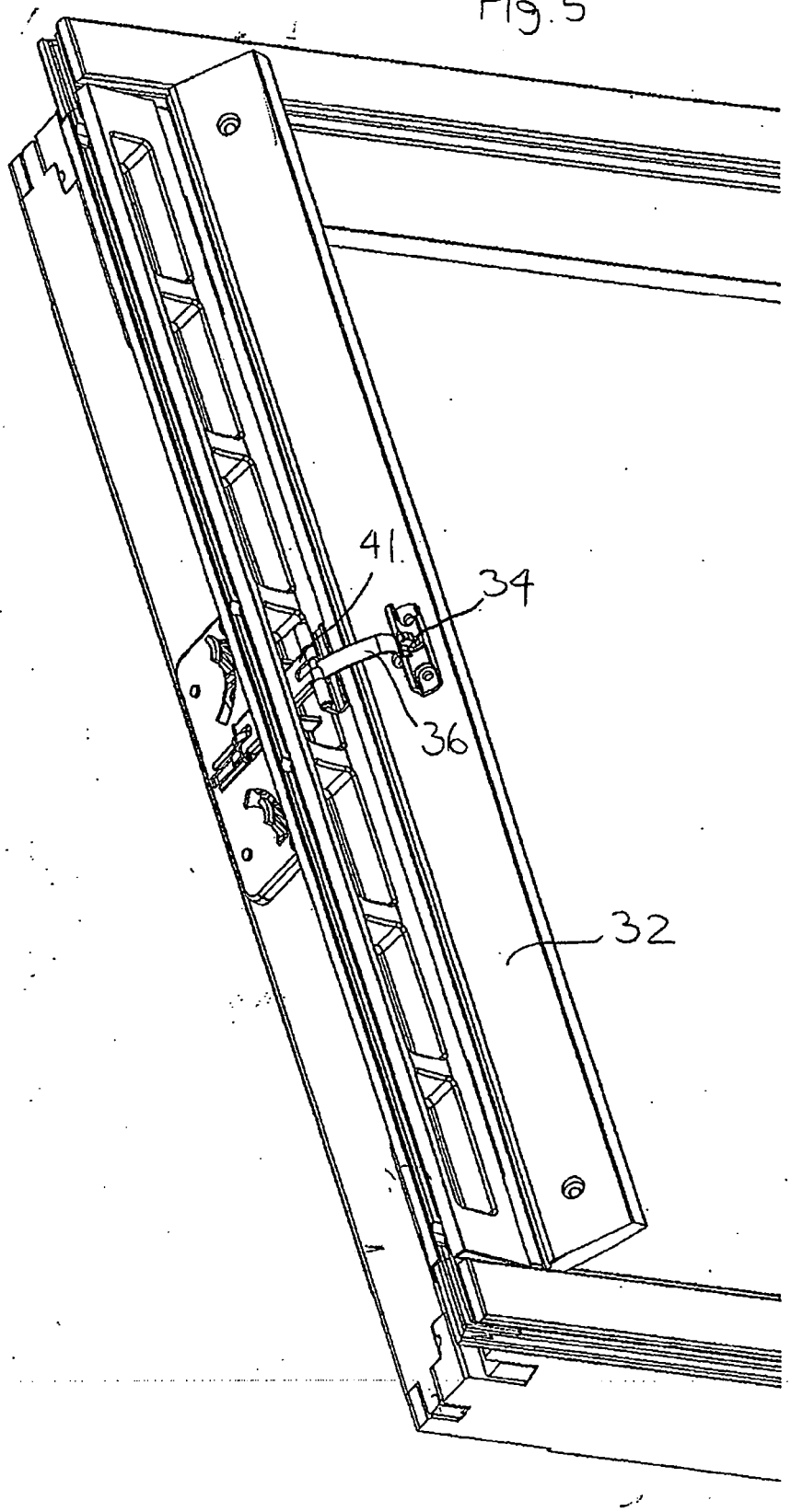
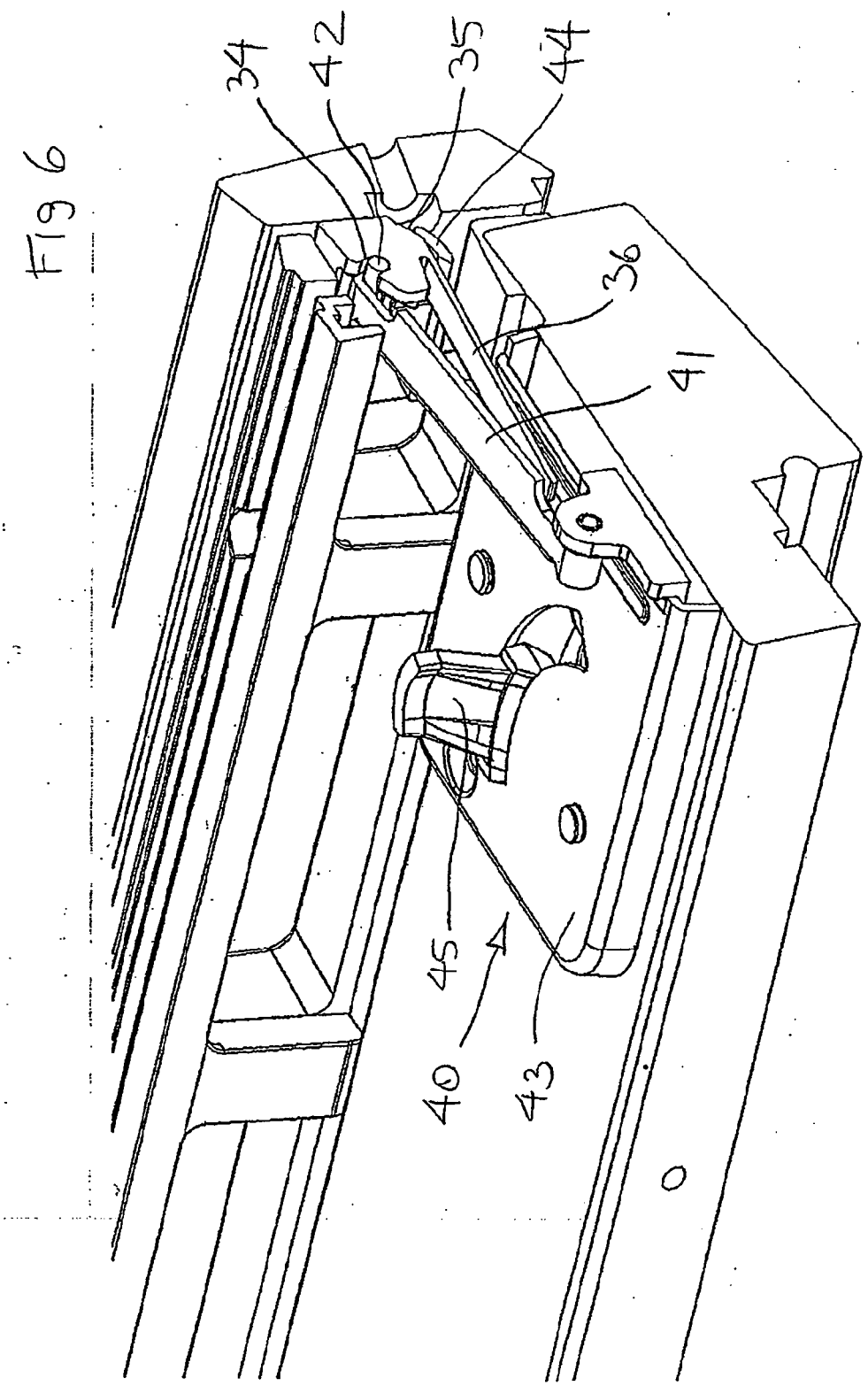


Fig 6



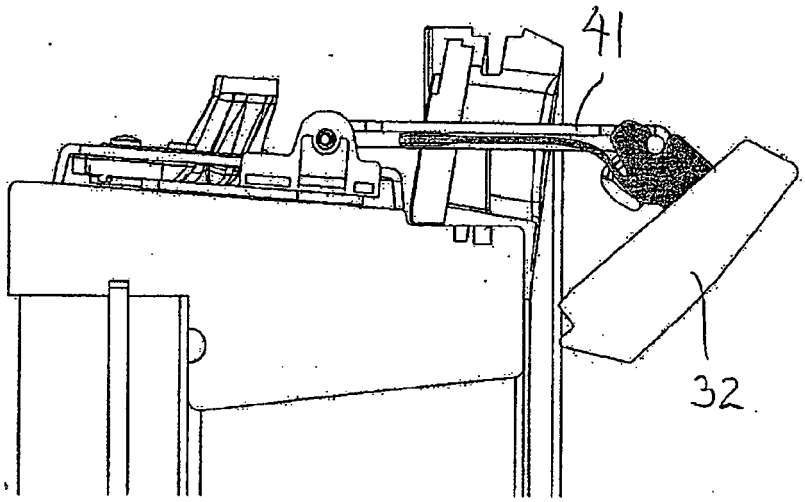


Fig. 7b

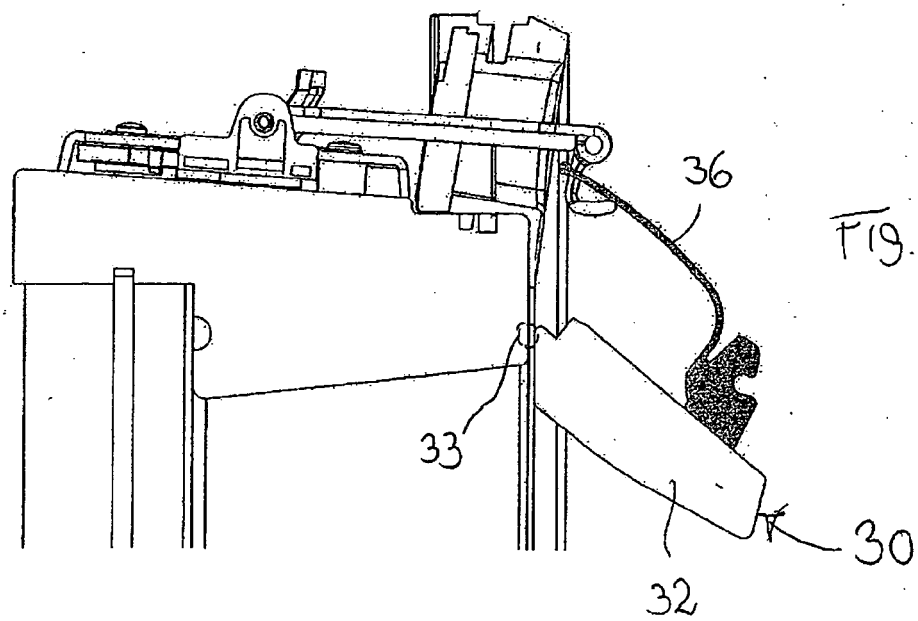


Fig. 7a

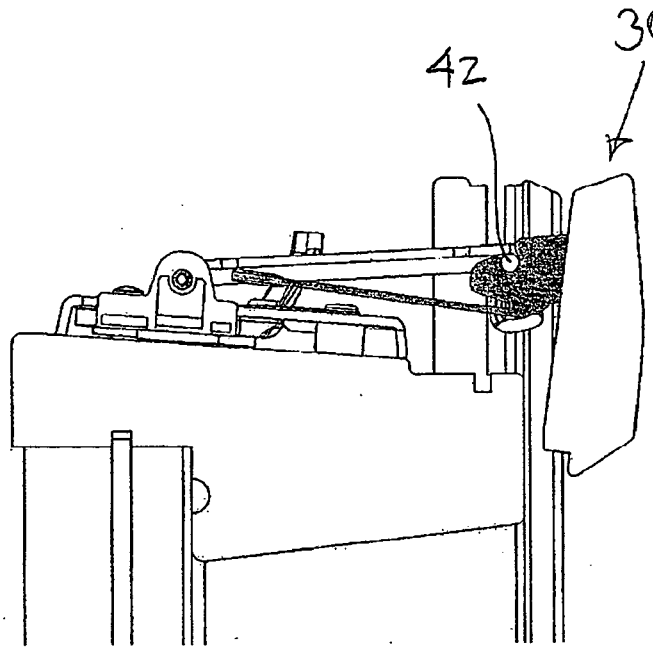


Fig. 7d

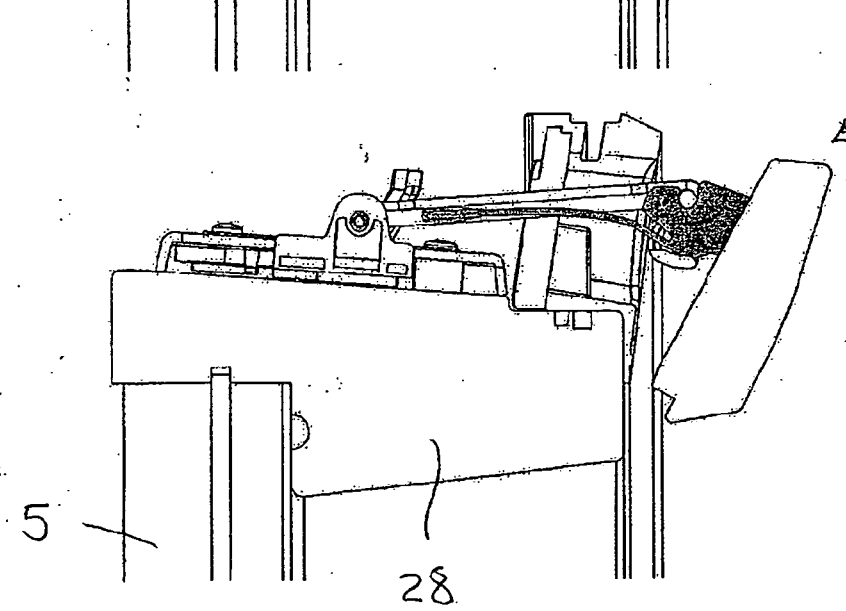
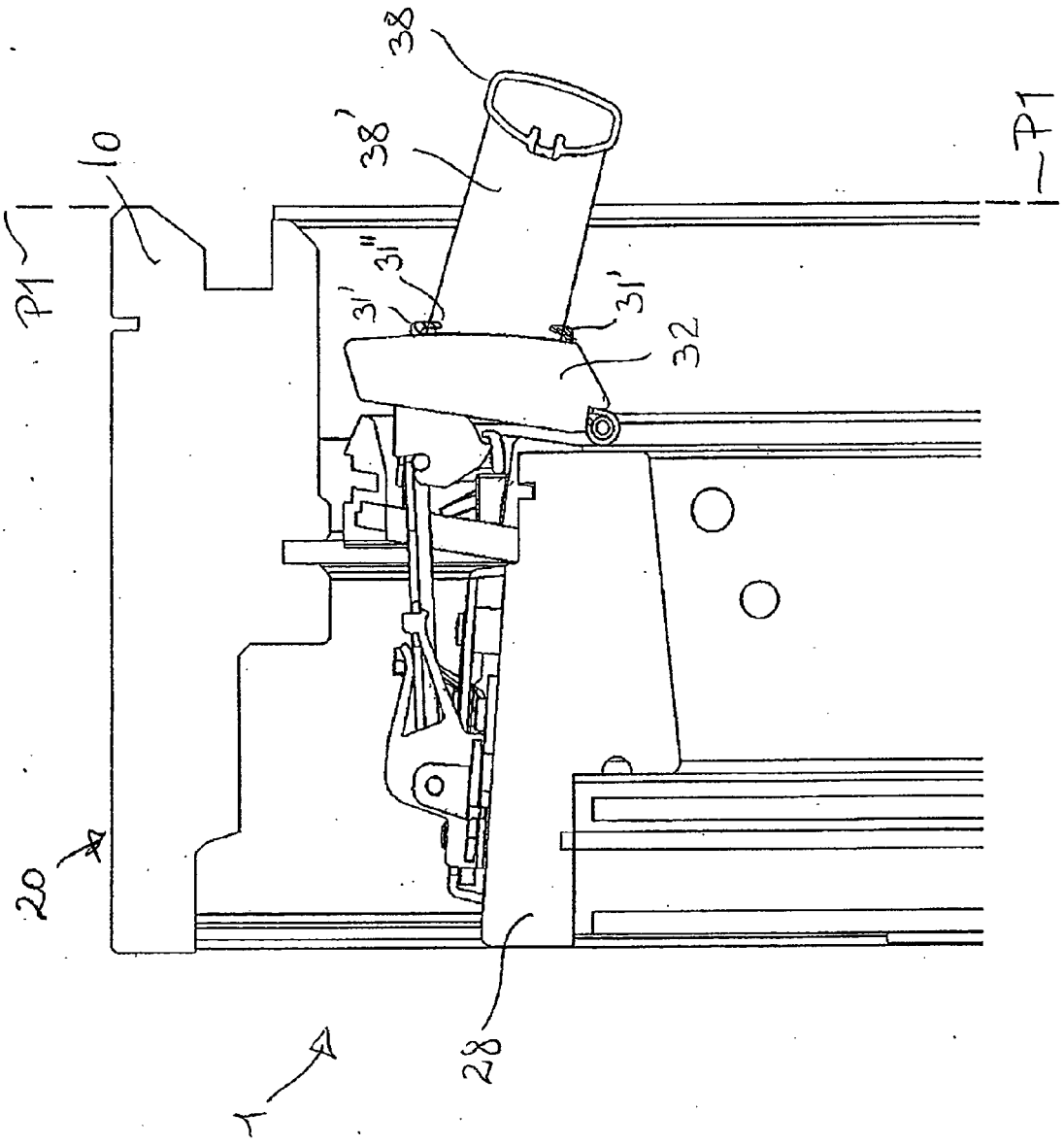


Fig. 7c

Fig. 8



REFERENCES CITED IN THE DESCRIPTION

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