

# United States Patent

[11] 3,575,452

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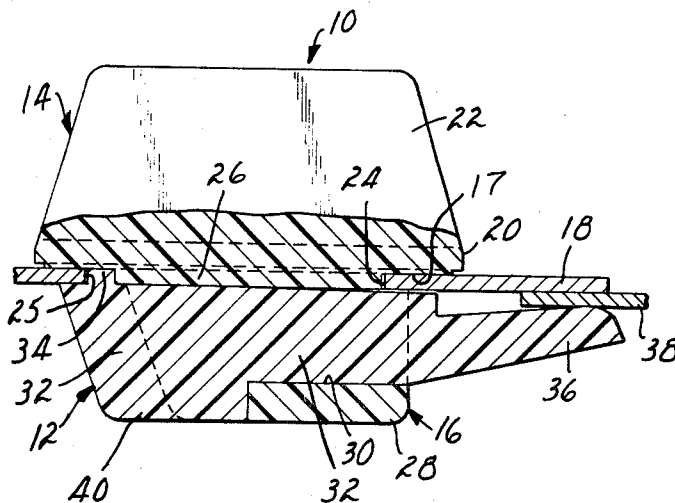
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[54] **PANEL LATCH**  
**6 Claims, 5 Drawing Figs.**

[52] **U.S. Cl.**..... 292/202  
 [51] **Int. Cl.**..... E05c 3/04  
 [50] **Field of Search**..... 292/202  
 (PLP), 347, 348, 203—211

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**ABSTRACT:** A latch formed of a body piece having a bearing surface to contact one face of a panel and a shank to project through a circular panel aperture which shank is formed with a diametrical aperture, and a crosspiece inserted into the shank aperture to bear on the opposed face of a panel and having a tongue to engage a second panel upon rotation of the latch and a locking tab to extend into a said panel aperture along the body piece shank to positively retain the latch on a panel from movement along its axis.



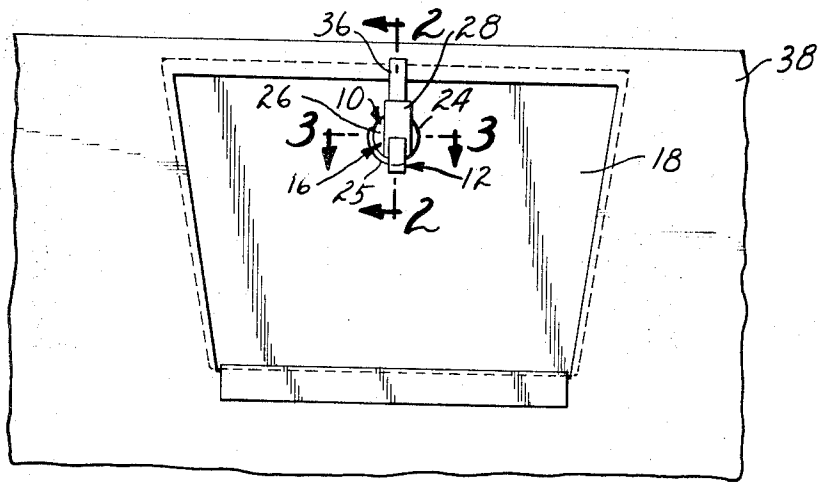


FIG. 1

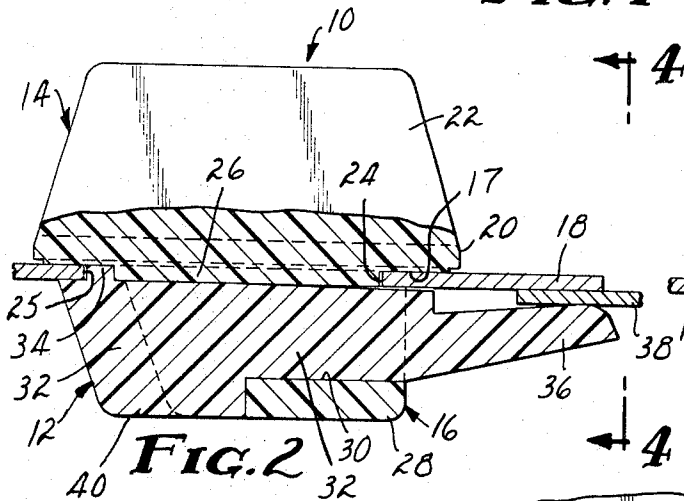


FIG. 2

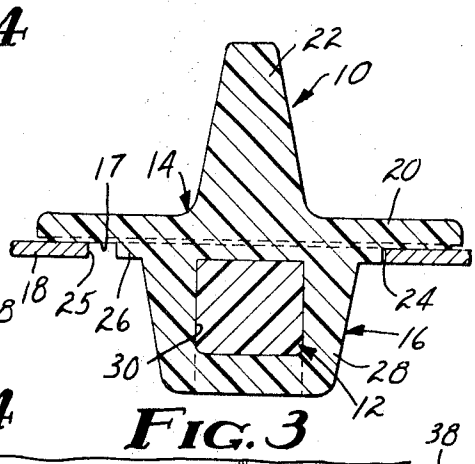


FIG. 3

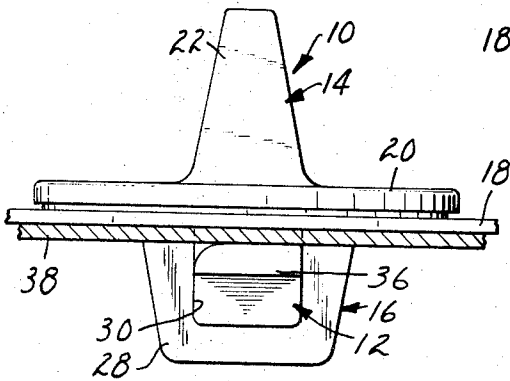


FIG. 4

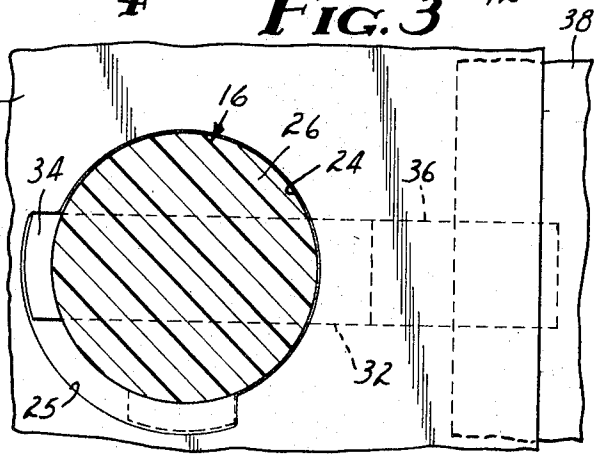


FIG. 5

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## PANEL LATCH

This invention relates to a two-piece polymeric panel latch which may be easily assembled on an apertured panel and which is positively retained thereon after assembly.

The prior art is replete with panel latches which are assembled on an apertured panel with a knob extending from one face of the panel, a shank extending through the panel and a tongue extending along the opposed face of the panel to engage a second panel upon rotation of the knob. Prior art devices have, however, generally required mechanical fasteners or a bonding material to hold the latch pieces together on a panel. Assembly of these devices, therefore, requires the use of special tools or a bonding material resulting in loss of time and additional expense. One latch which eliminates the need for special tools or a bonding material to assemble the latch parts is illustrated in U.S. Pat. No. 2,409,822 wherein a J-shaped spring is apertured to receive a shank projecting through a panel from a knob and extends along the panel to provide a latching tongue. That latch is, however, undesirable since the spring must be specially formed by bending a strip of spring material, thereby increasing the cost of manufacturing the latch and eliminating the use of inexpensive polymeric materials.

It is, therefore, an object of the present invention to provide an inexpensive panel latch which may be assembled on an apertured panel without tools or bonding materials and which is positively retained on the panel after assembly. It is a further object to provide a panel latch which when assembled on an apertured panel has a limited freedom of rotation to indicate when it is in a latched or unlatched position.

The present invention provides a moldable latch and one which is readily assembled. The latch comprises a body member having a knob, a bearing surface to engage a door or panel, and a shank having a diametrical aperture. A cotter or crosspiece extends through the shank to define a latching tongue on the extended end and the opposite end has a locking tab extending along the shank to increase its dimension in the door or panel to lock the crosspiece in place.

The novel features and advantages of the present invention will become apparent after reading the following description which refers to the accompanying drawing wherein:

FIG. 1 is a rear plan view of a latch made in accordance with the present invention and assembled on a panel;

FIG. 2 is a longitudinal sectional view taken along line 2-2 of FIG. 1;

FIG. 3 is a transverse sectional view taken along line 3-3 of FIG. 1;

FIG. 4 is a transverse view taken generally along line 4-4 of FIG. 2 of the latch assembled on a panel; and

FIG. 5 is a front plan view of the latch assembled on a panel and partially in section.

The latch of the present invention consists of two pieces, a polymeric body piece 10 and a polymeric cotter or crosspiece 12.

The body piece 10 is preferably formed of a polymeric material, for example ABS, and may be made by any one of various molding operations, such as injection molding or compression molding. It is a one-piece molding and comprises a knob 14 and an integral shank 16. The knob 14 is formed with a planar bearing surface 17 at the end thereof adjacent the shank to contact the outer face of a first panel such as door panel 18. This bearing surface 17 is preferably defined by one face of a generally disc-shaped knob base 20 from the opposed face of which a generally rectangular rib 22 extends. The shank 16 extends generally axially from the planar bearing surface 17 of the knob 14 to project through a panel aperture in which it may be freely rotated and it is formed with lesser radial dimensions than a panel aperture. In the illustrated embodiment the latch is assembled on a door panel 18 that is formed with an aperture comprising a first circular aperture 24 and about a 90° arc of a second circular aperture 25 concentric with and having a larger diameter than the first aperture 24. The shank is formed with a disc-shaped base 26

that is coaxial with the knob base 20, has a diameter equal to that of the panel first aperture 24, and has a thickness equal to that of the door panel 18. Extending from and across the shank disc 26 is a generally rectangular portion 28 formed with a rectangular aperture 30 that extends diametrically through the shank 16 and has one wall defined by the face of the shank disc 26.

The crosspiece 12 is preferably formed of a material similar to that of the body piece 10 and may also be made by any one of various molding operations. It is a one-piece molding and comprises a central portion 32, a locking tab 34, a tongue 36 and a shoulder 38. The central portion 32 is formed with cross-sectional dimensions equal to the inside dimensions of the body piece shank aperture 30 and a length greater than the diameter of the panel second aperture 25. The locking tab 34 extends from one surface of the central portion 32 perpendicular to the longitudinal axis and across the width thereof. It is formed on the central portion 32 such that when the latch is assembled on a panel the locking tab 34 extends along the body piece shank 16 into the panel aperture and with the shank 16 generally fills the panel aperture across the greater diameter thereof. In the illustrated embodiment the locking tab 34 has the shape of an arc of a ring with an inner diameter equal to the diameter of the shank disc 26 and an outer diameter equal to that of the panel second aperture 25. It is positioned near one end of the central portion 32 symmetrically across the width thereof to mate with the periphery of the shank disc 26 when the central portion is inserted into the shank aperture 30. The tongue 36 extends from the end of the central portion through the shank aperture 30 opposite the locking tab 34 and may be of any appropriate shape that will fit through the shank aperture 30 as the central portion 32 is inserted therein and that will engage the panel 18 and some portion of a second panel when the latch is assembled on a first panel and rotated. In the illustrated embodiment the tongue 36 has the same width and a lesser depth than the central portion 32. It extends from the central portion 32 spaced along its length from the surface thereof on which the locking tab 34 is positioned a distance generally equal to the thickness of a wall panel 38 that overlaps the inner face of the door panel 18 without overlapping the panel apertures 24 and 25. A shoulder 40 extends from and across the surface of the central portion 32 opposite the locking tab 34. It extends along the length of the central portion 32 from the end thereof nearer the locking tab 34 a distance sufficient to abut the rectangular portion 28 of the body piece shank 16 when the locking tab 34 mates with the periphery of the shank disc 26.

In use the latch is assembled on the door panel 18 by inserting the body piece shank 16 through the panel apertures 24 and 25 with the shank disc 26 in the panel first aperture 24 and the knob-bearing surface against the outer face of the panel 18. The end of the crosspiece 12 formed with the tongue 36 is then inserted through the shank aperture 30 until the locking tab 34 drops into the panel second aperture 25 and mates with the periphery of the shank disc 26 and the shoulder 40 abuts the rectangular portion 28 of the body piece shank 16. The surface of the crosspiece central portion on which the locking tab 34 is positioned then bears against the inner face of the door panel 18 to retain the bearing surface of the body piece 10 against the outer face of the panel 18. The rectangular rib 22 of the body piece knob 14 may then be grasped and rotated to trap the wall panel 38 between the door panel 18 and the end of the crosspiece tongue 36. Since the panel second aperture 25 is only about a 90° arc and the locking tab 34 extends into the panel second aperture 25, the latch may only be rotated 90° away from the latched position and the position of the rectangular rib 22 of the body piece knob 14 may be used to indicate that the latch is in the latched or the unlatched position. The stops provided by the aperture 25 limit rotation of the knob and the size of the panel aperture.

I claim:

1. A polymeric latch for use with a first panel which is formed with a circular aperture to prevent relative movement between said first panel and a second panel which overlaps the inner face of said first panel adjacent but not overlapping said aperture, said latch comprising:

- a molded polymeric body piece formed with a knob having a planar bearing surface to contact the outer face of a said first panel and a shank extending from said bearing surface generally axially of said knob to project through a said panel aperture, said shank having lesser radial dimensions than a said panel aperture and being formed with a diametrical aperture which at its nearest point to said bearing surface is spaced therefrom a distance equal to the thickness of a said first panel; and
- a molded polymeric crosspiece formed with a central portion having cross-sectional dimensions equal to those of said shank aperture and a length greater than the diameter of a said panel aperture to extend through said shank aperture and bear on the inner face of a said first panel on opposed sides of a said panel aperture, a locking tab extending from said central portion generally perpendicular to the length thereof to extend along said shank into a said panel aperture and with said shank to generally fill a said panel aperture across at least a diameter thereof when said crosspiece extends through said shank aperture, and tongue means extending from one end of said central portion to fit through said shank aperture as said central portion is inserted therein and to engage a said second panel upon rotation of said crosspiece with said body piece,

whereby upon insertion of said body piece shank through a said panel aperture and insertion of said crosspiece into said shank aperture, said body piece bearing surface is pulled against said outer face of a said first panel and said crosspiece locking tab extends along said shank into a said panel aperture to positively retain said crosspiece and said body piece on a said first panel, and upon rotation of said body piece knob said tongue means is rotated and may engage a said second panel and prevent relative movement of the said panels.

2. A latch as recited in claim 1 wherein said locking tab extends from said central portion of said crosspiece nearer one end thereof and said tongue means extends from the opposite end thereof.

3. A latch as recited in claim 2 wherein said crosspiece is formed with a shoulder extending therefrom opposed said locking tab to contact said body piece shank when said locking tab extends along said shank in a said panel aperture.

4. A polymeric latch for use with a first panel which is formed with a first circular aperture and a second aperture that is between a 90° arc and about a 180° arc of a second circular aperture concentric with and having a diameter greater than said first aperture to prevent relative movement

of said first panel and a second panel which overlaps the inner face of said first panel adjacent but not overlapping said apertures, said latch comprising:

- a molded polymeric body piece formed with a knob having a planar bearing surface to contact the outer face of a said first panel, a shank formed with a central disc generally coaxial with said knob having one face coplanar with said bearing surface and having a thickness equal to that of a said first panel and a diameter equal to that of a said panel first aperture and a rectangular portion extending from and across the face of said disc opposed said one face, said rectangular portion having dimensions to fit through the said panel apertures as said shank disc is fit into a said panel first aperture and being formed with an aperture therethrough at least one surface of which is planar and defined by said opposed face of said shank disc, and

- a molded polymeric crosspiece formed with a central portion having cross-sectional dimensions equal to those of said shank aperture and a length greater than the diameter of a said panel second aperture to fit through said shank aperture with one planar surface bearing against the inner face of a said first panel on opposed sides of the said panel apertures, a locking tab extending perpendicularly from said one planar surface of said central portion a distance generally equal to the thickness of a said first panel, having the shape of an arc substantially less than 90° of a ring with an inner diameter equal to that of a said panel first aperture and an outer diameter equal to that of a said panel second aperture, and positioned on said central portion to mate with the periphery of said body piece disc when said crosspiece extends through said shank aperture, a shoulder extending from said central portion opposite said locking tab to contact said shank when said locking tab mates with said disc and tongue means extending from the end of said central portion to fit through said shank aperture with said central portion and to engage a said second panel upon rotation of said crosspiece with said body piece,

whereby rotation of said latch is limited to the arc of a said panel second aperture by said crosspiece locking tab and upon rotation of said body piece knob through said limiting arc a said second panel may be engaged by said tongue to prevent relative movement of the said panels.

5. A latch as recited in claim 4 wherein said locking tab and shoulder extend from said central portion of said crosspiece nearer one end thereof and said tongue means extends from the opposite end thereof.

6. A latch as recited in claim 5 wherein said body piece knob comprises a disc coaxial with and having a diameter greater than that of said body piece shank disc and a raised rib extending from one face of said knob disc, the face of said knob disc opposed said one face thereof forming said planar bearing surface.

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