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Seidewand

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[54] **CYLINDER LOCK ASSEMBLY**

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[52] **U.S. Cl.** **70/455**

[51] **Int. Cl.** **E05b 17/18**

[58] **Field of Search** 70/455, 55, 56, 423

[56] **References Cited**

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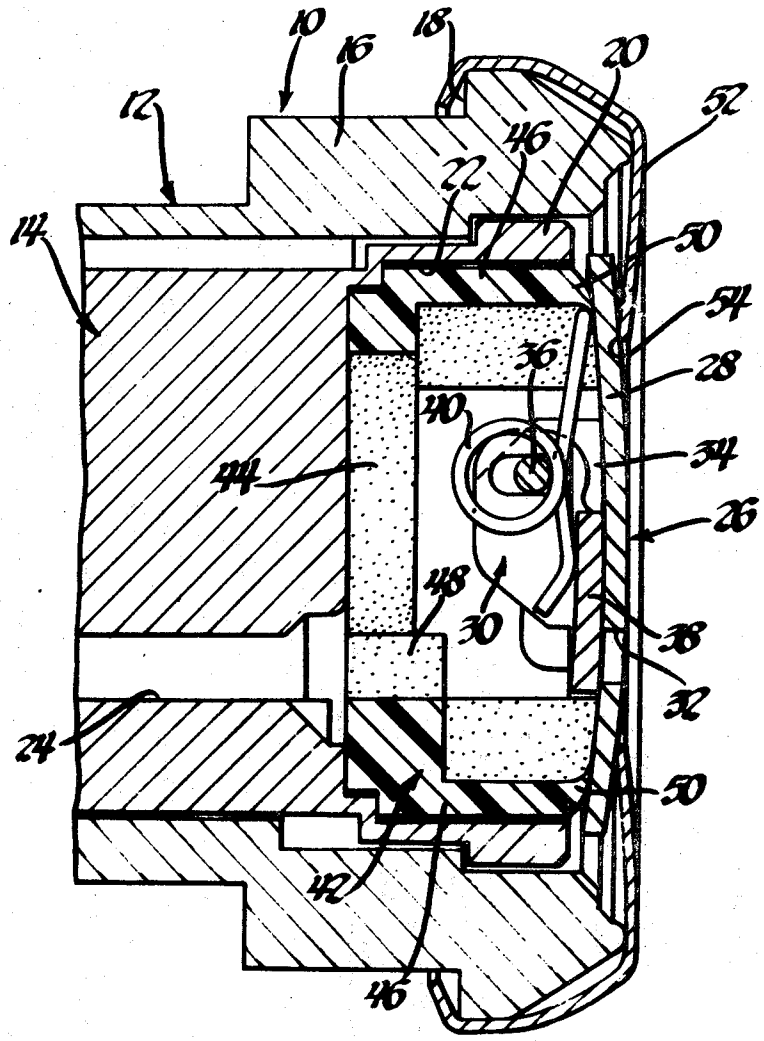
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[57] **ABSTRACT**

A cylinder lock assembly including a cylinder portion, a barrel portion rotatably disposed on the cylinder portion, a plastic cover support member disposed in a cavity at the outboard end of the barrel portion, the support member having a wall portion with a beveled edge protruding beyond the confines of the cavity, a cover disc disposed over the cavity and engaging the beveled edge of the wall portion, and a retaining ring attached to the cylinder portion and engaging the cover disc in line contact to retain the latter on the lock assembly. The retaining ring forcibly urges the cover disc against the beveled edge thereby resiliently deforming the latter so that the cover disc is tightly pressed against the retaining ring to effect a seal against foreign matter intrusion.

4 Claims, 3 Drawing Figures



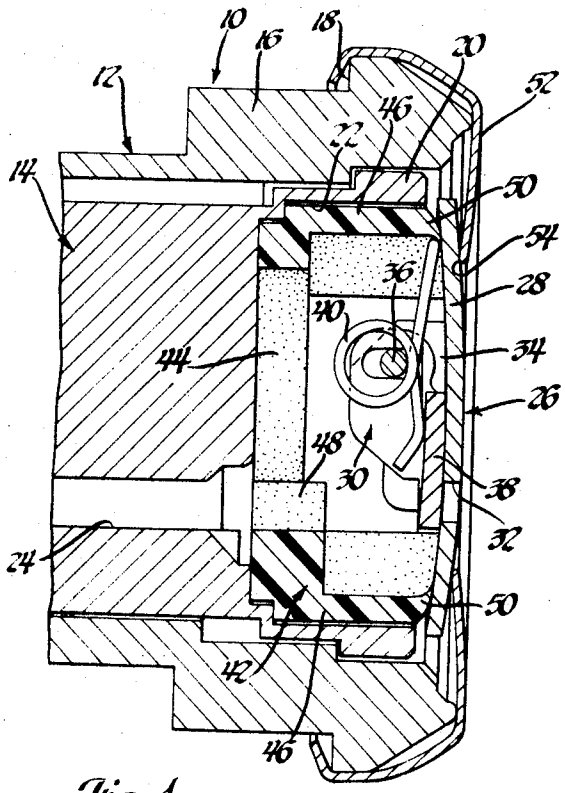


Fig. 1

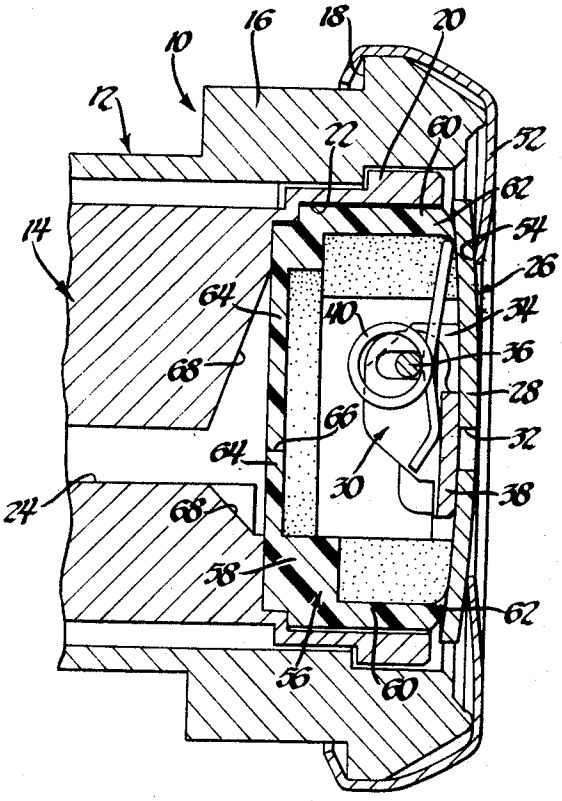


Fig. 2

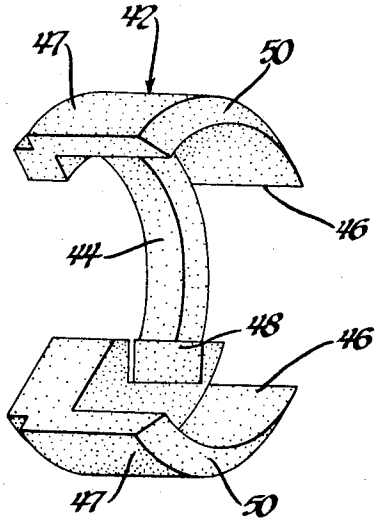


Fig. 3

CYLINDER LOCK ASSEMBLY

This invention relates generally to lock assemblies and more particularly to cylinder type lock assemblies.

Virtually all cylinder type lock assemblies include a cylinder portion adapted for rigid attachment to a mounting structure, as for example the outer panel of an automobile door, and a barrel portion rotatably disposed within the cylinder portion. Further, the barrel portion normally has connected thereto an actuating member or cam adapted to operate a remote mechanism, as for example a part of an automobile type door latch assembly, in response to rotation of the barrel portion and normally includes locking means for selectively preventing rotation of the barrel portion except upon insertion into a kay slot therein of a properly coded key. Such locking mechanisms almost invariably include a plurality of relatively small movable elements which are sensitive to the presence of foreign matter and especially moisture which, in cold climates, is subject to jam the locking mechanism by freezing. Accordingly, in applications where the lock assembly might be subjected to severe environmental conditions some provision must be made to prevent the intrusion into the key slot of foreign matter. Typically, foreign matter protection is effected by a disc covering the barrel portion of the lock assembly, the disc being biased outboard against a retaining ring rigidly attached to the cylinder portion of the assembly. Usually, the cover disc is held tightly against the retaining ring by a plurality of small springs disposed between the barrel portion and the cover disc. This structure, while accomplishing the desired result, is relatively difficult to assemble because of the necessity of maintaining the positions of the relatively small springs during several stages of the assembly procedure. A lock assembly according to this invention represents an improved cylinder lock construction which may be more economically assembled and which improves the resistance of the lock assembly to foreign matter intrusion.

Accordingly, the primary feature of this invention is that is provides an improved cylinder type lock assembly. Another feature of this invention is that it provides an improved cylinder type lock assembly particularly adapted for efficient and economical assembly and for improved resistance to foreign matter intrusion. Yet another feature of this invention is that it provides an improved cylinder type lock assembly including a cylinder portion, a rotatable barrel portion, and a cover member for sealing the outboard end of the barrel portion against foreign matter intrusion, the cover member being biased outboard into sealing engagement against a retaining ring by a unitary plastic support member housed in a cavity within the barrel portion and resiliently engaging the inboard surface of the cover member to effect the seal between the cover member and the retaining ring. A further feature of this invention resides in the provision in the lock assembly of a unitary plastic support member adapted for reception in a cylindrical cavity in the barrel portion and including a base portion and an upstanding wall portion the distal end of which is beveled to provide a resiliently deformable edge section engageable on the inboard surface of the cover disc for biasing the latter outboard against the retaining ring. A still further feature of this invention resides in the provision in the lock assembly of a plastic support member further including a pair of flexible lips which meet at an interface outboard of the kay slot but inboard of the cover disc to provide a secondary seal for the key slot, the lips resiliently yielding to permit penetration of the key into the key slot.

These and other features of this invention will be readily apparent from the following specification and from the drawings wherein:

FIG. 1 is a fragmentary sectional view of a cylinder type lock assembly according to this invention;

FIG. 2 is similar to FIG. 1 but showing a modified construction; and

FIG. 3 is a perspective view of the plastic support member.

Referring now to FIG. 1 of the drawings, thereshown in fragmentary sectional view is the outboard end of a cylinder type lock assembly designated generally **10**, the assembly including a cylinder portion **12** and a barrel portion **14** rotatably disposed within the cylinder portion. The cylinder portion **12** is adapted for rigid attachment to a supporting panel structure, not shown, by conventional means and includes an enlarged head or outboard end **16** defining an annular flange **18.** The barrel portion **14** includes an outboard flanged head **20,** a generally cylindrical cavity **22** in the head opening outboard with resect to the cylinder portion, and a key slot **24** extending longitudinally of the barrel portion generally the entire length thereof and opening into the cavity **22.** The barrel portion supports therewithin a locking mechanism, not shown, as for example a conventional side bar type mechanism, adapted to selectively lock the barrel portion **14** against rotation relative to the cylinder portion **12.** For a more detailed description of a side bar type locking mechanism, reference may be made to U.S. Pat. No. 2,949,762 issued on Aug. 23, 1960 to Theodore H. Johnstone and assigned to the Assignee of this invention. It will be understood, of course, that the side bar type locking mechanism is only one type of locking mechanism which may be incorporated in the lock assembly according to this invention and that other conventional locking mechanisms are equally applicable.

The cylinder lock assembly **10** further includes a cover assembly **26** including a slightly convex cover disc **28** and a shutter assembly **30.** The disc **28** is circular in configuration and includes a key aperture **32,** the diameter of the disc being slightly greater than the diameter of the cavity **22** in the barrel portion **14.** The shutter assembly **30** includes a pair of spaced lugs rigidly attached to the inboard surface of the disc **28** generally at opposite ends of the key aperture **32,** only one lug **34** being shown in FIGS. **1** and **2.** The lugs rigidly support a pin **36** and the pin pivotally supports a shutter **38** for movement between a closed position, FIGS. **1** and **2,** wherein a portion of the shutter closes the key aperture **32** from behind the disc and an open position, not shown, pivoted counterclockwise from the closed position. A torsion spring **40** coiled about the pin **36** bears at one end against the shutter and at the other end against the disc **28** thereby to bias the shutter toward the closed position.

Referring particularly now to FIGS. **1** and **3,** the lock assembly further includes a unitary cover support member designated generally **42.** The cover support member **42** is generally cup-shaped in configuration and includes a base portion **44** and an integral wall portion **46.** As seen best in FIG. **3,** the wall portion **46** extends generally perpendicularly with respect to the plane of the base portion **44** and, in the embodiment

shown, is divided into two diametrically opposed and, consequently, symmetrical wall sections **47.** The base portion **44** is generally circular in configuration and includes a rectangular slot **48.** The cup shape configuration of the cover support member **42** corresponds generally to the cylindrical configuration of the cavity **22** in the barrel portion **14** of the lock assembly, so that the support member is adapted for seating disposition within the cavity, the slot **48** registering with the outboard end of the key slot **24** in the barrel portion, FIG. **1.** The height of each wall section **47** slightly exceeds the depth of the cavity **22** so that each wall section projects outboard beyond the confines of the cavity. As seen best in FIG. **3,** the outboard end of each wall section **47** is beveled, as at **50,** the bevel extending generally from the tip of the wall section inboard to the lip of the cavity **22** in the barrel portion.

The cover support member **42** is preferably fabricated by conventional molding techniques from a plastic type material such as cured elastomer, nylon, or the like. When so fabricated, the wall sections exhibit a predetermined amount of inherent resiliency. Further, the bevels **50** on each wall section define edges which exhibit substantially more resilience than the remainder or body of the wall section. Accordingly, the beveled edges, when compressed, generate a resilient resisting force on the object effecting compression.

As seen best in FIG. **1,** the cover support member **42** is disposed in the cavity **22** with the slot **48** in register with the key slot **24** and with the resilient edge sections on each wall section **47** of the wall portion **46** projecting outboard of the barrel portion **14.** The inboard surface of the disc **28** seats on each of the resilient edge sections and generally completely shields the cover support member and the cavity **22,** the key aperture **32** being aligned with the slots **48** and **24** and the shutter assembly **30** being disposed within the interior of the cover support member. The cover support member is retained on the lock assembly by a retaining ring **52** bent around the outboard portion **16** of the cylinder portion **12** and spun over the annular flange **18.**

As best seen in FIG. **1,** the retaining ring **52** is slightly inwardly dished to engage the outboard surface of the disc **28** generally in circular line contact, as at **54.** The retaining ring forcibly urges the disc **28** inwardly against the edge sections of the wall portion **46** thereby resiliently deforming the latter, FIG. **1.** The resilient deformation of the edge sections functions to firmly seat the cover support member **32** in the cavity **22** while simultaneously exerting an outwardly directed force on the disc **28** thereby to effect a substantially weather tight seal in the area of the line contact **54** between the retaining ring and the disc.

In operation, with the lock assembly rigidly attached to a supporting panel structure, as for example a vehicle door outer panel, the shutter **38** normally closes the key aperture **32** in the disc to prevent intrusion of moisture and other foreign matter through the key aperture. Similarly, the seal in the area of the line contact **54** prevents foreign matter intrusion around the disc. When it is desired to actuate the remote mechanism through rotation of the barrel portion of the lock assembly **10,** a properly coded key, not shown, is inserted in the key aperture **32** and through the slot **48** into the key slot **24,** the shutter **38** being pivoted to the open position by the key during the insertion procedure. After the key is fully inserted the barrel portion **14** is rotated causing simultaneous rotation of the cover support member **42** and the cover assembly **26,** the disc **28** sliding relative to the retaining ring **52** at the line contact **54** therebetween. Subsequently, when the key is withdrawn, the spring **40** biases the shutter **38** back to the closed position, FIG. **1.**

Referring now to FIG. **2,** thereshown is a modified cover support member designated generally **56** disposed in the cavity **22** of the barrel portion **14** inboard of the cover assembly **26.** The modified support member includes a base portion **58** and a wall portion **60,** the latter again comprising a pair of diametrically opposed wall sections having beveled outboard edge sections **62.** The base portion **58** of the support member **56** is modified to include a pair of integral lips **64** self-biased to a normal closed position, FIG. **2,** wherein the lips define a generally flat surface overlying the key slot **24.** Lips **64** meet at an interface **66** aligned with the key slot **24** and the key aperture **32** in the disc **28.** Accordingly, the lips **64** form a secondary closure behind the shutter **38** to provide added resistance to foreign matter intrusion into the key slot **24.**

When the key is inserted into the key aperture **32,** the shutter **38** is first pivoted from the closed to the open position whereafter the nose of the key engages the lips **64** at the interface **66** to effect downward deflection of the lips into a conical portion **68** of the barrel portion **14.** The lips **64** thereby wipe the key clean of foreign matter during the insertion procedure to even further protect against foreign matter intrusion.

It will be apparent to those skilled in the art that the provision of a unitary plastic cover support member, as opposed to a plurality of relatively small coil springs, for the purpose of outwardly biasing the cover assembly permits substantial simplification of the assembly procedure for the cylinder lock assembly **10.** More particularly, with a unitary cover support member there are no problems of maintaining the alignment of the small coil springs within the barrel portion **14** during assembly of the disc on the barrel portion. Further, the problems normally associated with handling large numbers of relatively small components is completely eliminated. It will also be apparent to those skilled in the art that while the wall portions **46** and **60** of the support members **42** and **56** are formed into two diametrically opposed wall sections, it is perfectly feasible to provide a single generally cylindrically shaped wall section, the choice being a matter of design convenience.

Having thus described the invention, what is claimed is:

1. In a lock assembly including a cylinder portion, a barrel portion disposed on said cylinder portion for rotation relative to the latter, said barrel portion having a key slot extending generally the entire length thereof opening into an enlarged cavity therein adjacent the outboard end of said cylinder portion, and lock means on said barrel portion responsive to insertion in and withdrawal of a key from said key slot for selectively locking said barrel portion against rotation relative to said cylinder portion, the improvement comprising, a cover support member disposed in said cavity and including a base portion conforming generally to the configuration of the base of said cavity and an integral side wall portion extending generally parallel to the sides of said cavity, means on said wall portion defining an integral resiliently deformable edge section projecting outboard of the confines of said cavity, a cover member

having a key aperture therein, said cover being disposed over said cavity with said key aperture in register with said key slot and in engagement on said edge section of said wall portion, and retainer means rigidly attached to said cylinder portion and slidably engaging said cover member thereby to retain the latter on said lock assembly, said retainer means forcibly urging said cover member against said edge section thereby to effect resilient deformation of the latter for generating a substantially weather tight seal between said retainer means and said cover member.

2. In a lock assembly including a cylinder portion, a barrel portion disposed on said cylinder portion for rotation relative to the latter, said barrel portion including a key slot extending generally the entire length thereof opening into an enlarged generally cylindrical cavity disposed adjacent the outboard end of said cylinder portion, and tumbler means on said barrel portion responsive to insertion in and withdrawal of a key from said key slot for selectively locking said barrel portion against rotation relative to said cylinder portion, the improvement comprising, a generally cup-shaped cover support member disposed in said cavity and including a base portion conforming to the configuration of the base of said cavity and an integral symmetrical wall portion extending generally parallel to the sides of said cavity, said wall portion projecting outboard beyond the confines of said cavity and being beveled at the distal end thereof to define a resiliently deformable edge section of said wall portion, a cover disc having a key aperture therein, said cover disc being disposed over said cavity with said key aperture in register with said key slot and in engagement on said wall portion edge section, and retainer means rigidly attached to said cylinder and slidably engaging said cover disc thereby to retain the latter on said lock assembly, said retainer means forcibly urging said cover disc against said edge section thereby to effect resilient deformation of the latter for generating a substantially weather tight seal between said retainer means and said cover disc.

3. In a lock assembly including a cylinder portion, a barrel portion disposed on said cylinder portion for rotation relative to the latter, said barrel portion including a key slot extending generally the entire length thereof opening into an enlarged generally cylindrical cavity disposed adjacent the outboard end of said cylinder portion, and tumbler means on said barrel portion responsive to insertion in and withdrawal of a key from said key slot for selectively locking said barrel portion against rotation relative to said cylinder portion, the improvement comprising, a generally cup-shaped plastic cover support member disposed in said cavity and including a base portion defining a segment of a circle and a pair of integral diametrically opposed side walls extending generally parallel to the sides of said cavity, each of said side walls projecting outboard beyond the confines of said cavity and being beveled at the distal end thereof to define a resiliently deformable edge section on each of said side walls, a cover disc having a key aperture therein, shutter means on said cover disc adapted to normally close said key aperture, said cover disc being disposed over said cavity in engagement on said side wall edge sections with said key aperture in register with said key slot and with said shutter means projecting into said cavity, and a retaining ring rigidly attached to said cylinder portion and slidably engaging said cover disc substantially in line contact thereby to retain the said cover disc on said lock assembly, said retaining ring forcibly urging said cover disc against each of said edge sections thereby to effect resilient deformation of the latter for generating a substantially weather tight seal between said retaining ring and said cover disc.

4. The improvement recited in claim 3 wherein said base portion includes an opposed pair of integral lips self-biased to form a generally flat surface outboard of said key slot for preventing the intrusion thereinto of foreign matter and adapted for separation along an interface aligned with said key slot upon insertion of a key through said cover disc key aperture and into said key slot.

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