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J. A. ROGAS ETAL
SLIDING DOOR CLOSURE

3,246,363

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2 Sheets-Sheet 1

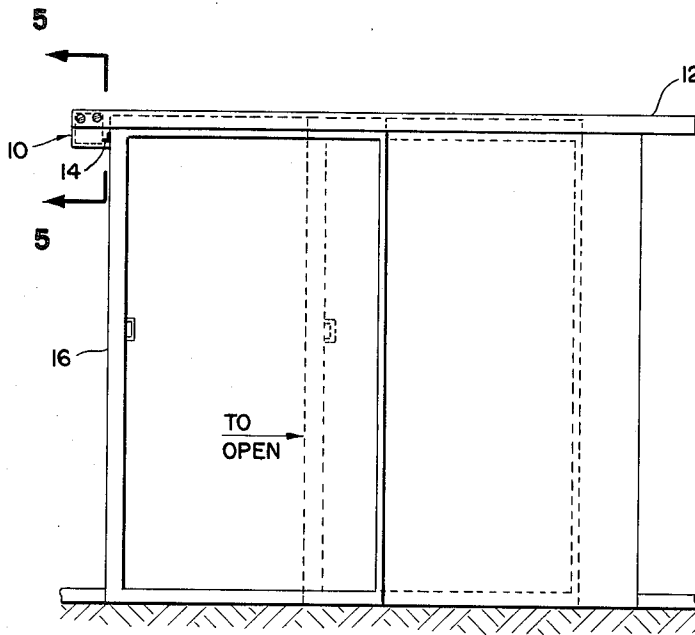


FIG. 1

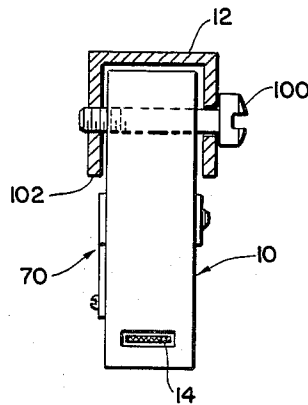


FIG. 5

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2 Sheets-Sheet 2

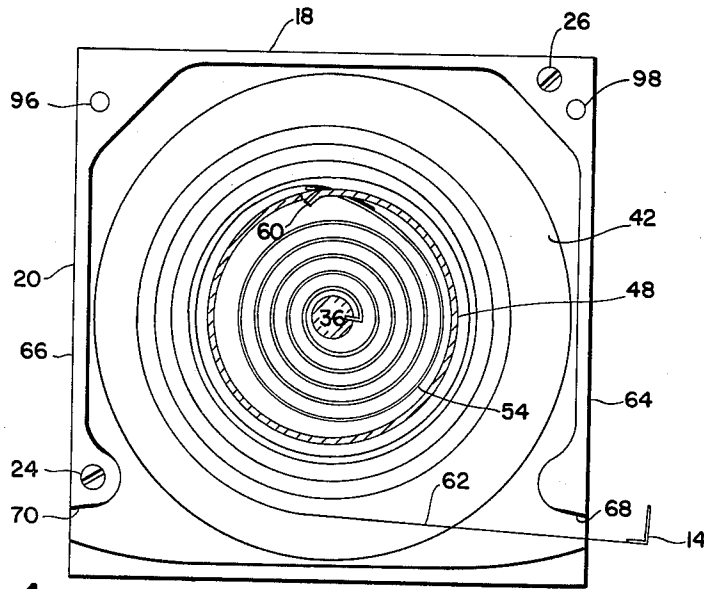


FIG. 4

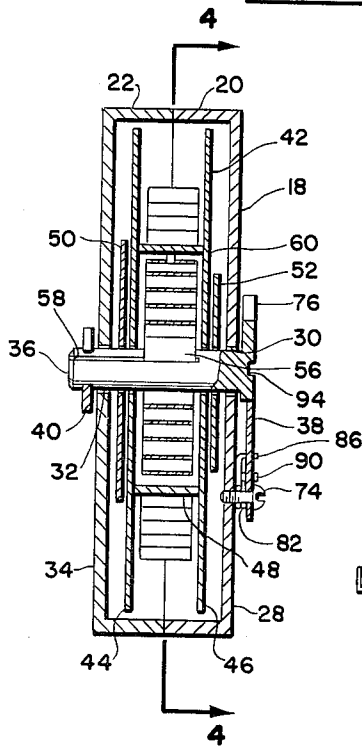


FIG. 3

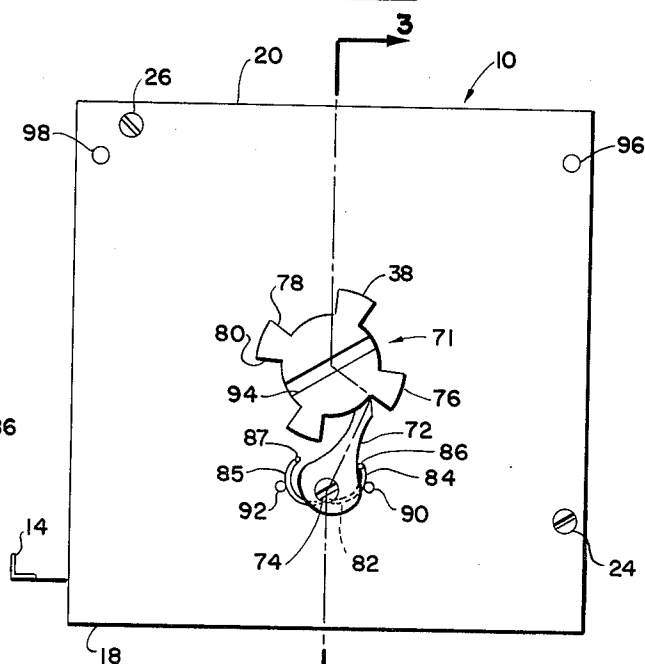


FIG. 2

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SLIDING DOOR CLOSURE

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2 Claims. (Cl. 16-78)

This invention relates to a door closure and, in particular, to a closure mechanism for use with sliding doors or the like.

It is known in the art that a closure mechanism may be provided for sliding doors which includes a spring biased reel with a band wound on its outer surface which is connected to the door. The spring is so wound that when the sliding door is opened the flexible band plays off the reel and the tension of the spring increases. Upon release of the door, the force of the spring winds in the flexible band and pulls the door to a closed position. Although some of these prior art devices have had mechanisms for adjusting the tension of the springs, these mechanisms have suffered from the disadvantage that they have slipped, and hence, the springs have had insufficient force to close the door. Moreover, the door closure mechanisms were incapable of being assembled so that they could close either left or right hand opening doors.

It is, therefore, the principal object of the present invention to provide a mechanism for automatically closing sliding doors which includes means for adjusting the tension of the spring of the closure mechanism, which means is positively locked into position and, hence, will not slip.

Another object of the invention is to provide a sliding door closure which is readily convertible from right handed to left handed operation and the spring adjusting mechanism is also readily adjustable so as to provide a positive lock once the spring is adjusted as desired.

Still a further object of the invention is to provide a sliding door closure which is simple in construction and readily adaptable for the fitting in a door frame.

According to the principal aspect of the present invention, a coil spring-type return door closure mechanism is provided in which there is a means for readily adjusting the tension of the spring, which means includes a ratchet wheel fixed to the shaft which carries the coil spring in the closure and a pawl on the front wall of the housing of the closure which engages the ratchet wheel and, thereby provides a positive locking mechanism for the spring adjusting means.

According to another aspect of the invention, a housing for the sliding door closure is provided in which there are a pair of openings on opposite sides of the housing and the housing is formed of two similar sections which are readily removable so that the spring and reel assembly may be reversed and the flexible band on the reel may be disposed out of either of said openings as desired. Thus, the closure mechanism may be utilized for either right hand or left hand opening doors. Furthermore, the pawl of the spring tensioning means generally described above is designed so that it may engage the ratchet wheel to prevent rotation of the shaft carrying the coil spring regardless of which direction the ratchet rotates or the coil spring is arranged.

Other objects, aspects and advantages will become apparent from the following description taken in connection with the accompanying drawings wherein:

FIG. 1 is a front elevational view showing the closure mechanism of the present invention installed in a frame for a sliding door;

FIG. 2 is an elevational view of the front of the sliding door closure of the present invention;

FIG. 3 is a sectional view taken along line 3-3 of FIG. 2;

FIG. 4 is a partial sectional view taken along line 4-4 of FIG. 3 which is the plane through which the housing of the closure mechanism is divided into two sections; and

FIG. 5 is a sectional view taken along line 5-5 of FIG. 1.

Referring now to the drawings in detail, the closure mechanism of the present invention is referred to generally by numeral 10. As seen in FIG. 1, the door closure mechanism 10 may be positioned within a channel-shaped frame 12 for a door with the end of the flexible band 14 of the mechanism affixed to the sliding door 16 by any suitable means. Generally speaking, when the door 16 is moved to the right, the band 14 is unwound from the mechanism and is extended to the position shown in dotted lines and, after the door is released, the coil spring within the mechanism rewinds the band and returns the door to the position shown in full lines in FIG. 1.

Looking now to the details of the closure mechanism as seen FIGS. 2 to 4, there is provided a housing 18 which is composed of a front section 20 and a rear section 22. The two sections of the housing are readily secured together by means of screws 24 and 26. The front wall 28 of the front section 20 has a central opening 30 which is aligned with an opening 32 in the rear wall 34 of the housing. Rotatably positioned in the openings is a round shaft 36 which includes a ratchet wheel 38 on the front face of the housing. The shaft is retained in the openings 30 and 32 by means of a retaining or spring clip 40 adjacent the rear wall of the housing.

A reel 42 is positioned within the interior of the housing and comprises a pair of plates 44 and 46 which are rotatable with respect to the shaft 36 and a ring member 48 which is fixed to the plates 44 and 46 by welding or the like. Washers 50 and 52 are positioned on opposite sides of the plates 44 and 46 to enhance the free rotation of the reel about the shaft 36. The spring for the closure mechanism is in the form of a coil spring 54 which is wound around the shaft 36 and has its inner end 56 fixed into a slot 58 in the shaft. The outer end of this spring has an opening so it can be hooked over an inwardly extending lip (see FIG. 4) which is punched in from the ring member 48 of the reel. A flexible band 62 adapted to have its outer end 14 connected to a sliding door is wound about the reel 42 and has its inner end also disposed over the lip 60. As can be best seen in FIG. 4, the inner end of the flexible band must first be disposed over the lip 60 before the spring 54 and the latter tends to retain the flexible band on the lip 60.

The housing 18 of the closure is provided with a pair of opposed side walls 64 and 66 which have openings 68 and 70 at the lower end thereof through which the flexible band 62 may extend, depending upon which direction the band and coil spring are wound about the shaft 36. Since the two sections 20 and 22 of the housing are merely connected together by means of screws 24 and 26, the housing may be readily disassembled and the reel 42 including the flexible band 62 and coil spring 54 may be reversed so that the door closure may be operable for either left hand or right hand opening doors.

One of the principal features of the invention is the provision of a means 71 for readily adjusting the tension of the coil spring 54 and, when once adjusted, it is positively locked into a fixed position and, hence, will not slip. The spring adjusting means 71 comprises the ratchet wheel 38 which is integral with the shaft 36 and a pawl 72 which is pivotally mounted on a screw 74 which is mounted into the front wall 28 of the housing 18. As can be best seen

from FIG. 2 of the drawings, the ratchet wheel 38 has a plurality of circumferentially spaced teeth 76 having side walls 78 and 80 which extend radially with respect to the axis of rotation of the shaft 36 and of the ratchet wheel. Also, the end of the pawl 72 is somewhat pointed. Due to the configuration of the end of the pawl and of the ratchet teeth, it is ensured that once the ratchet is rotated to the desired position to tension the coil spring 54, the pointed end of the pawl 72 will positively lock the ratchet wheel into position. A spring member 82 is wound about a portion of the screw 74 and has a pair of curved lips 84 and 85 which have upstanding portions 86 and 87, respectively, adapted to engage opposite sides of the pawl. Two pins 90 and 92 extending from the front wall 28 of the housing bear against the outer sides of the lips 84 and 85 so that the spring 82 will be constantly positioned upwardly thereby holding the pawl in a substantially vertical position. Also, the upstanding portion 86 of the lip 84 of the spring urges the pawl into engagement with the ratchet wheel 38 thus further ensuring the locking of the ratchet wheel 38. The portion 87 of the spring 82 serves the same purpose as upstanding portion 86 when the point of the pawl is pivoted to the left of the screw 74 rather than to the right as seen in FIG. 2.

The ratchet wheel is provided with a slot 94 which is adapted to receive a screwdriver or similar hand tool. It can be appreciated that by rotating the ratchet wheel 38 in a counterclockwise direction, the tension of the coil spring 54 is increased and the pawl 72 will merely ride over the ends of the teeth 76 of the ratchet wheel. However, if it is desired to decrease the tension of the coil spring 54, the pawl may be moved by hand out of engagement with the ratchet wheel 38 against the force of the spring lip 84 to permit the ratchet under the force of the coil spring to rotate in a clockwise direction. Thereafter, the pawl may be released and the spring lip 84 will return the pawl into locking engagement with the ratchet wheel 38.

It is seen from the above described arrangement that not only may the two sections 20 and 22 of the housing of the door closure be separated so as to reverse the position of the coil spring 54 and reel 42 but also the pawl 72 may be reassembled by merely unscrewing the screw 74 from the housing and pivoting the end of the pawl to a position to the left of the screw 74 rather than to the right as shown in FIG. 2 so as to engage the ratchet wheel and prevent it from rotating in a counterclockwise direction. The spring arrangement 82 is advantageous in that it will continuously urge the pawl 72 into engagement with the ratchet wheel 38 regardless of whether the pawl is arranged to prevent the rotation of the ratchet wheel in either the counterclockwise or clockwise direction. Thus, the door closure of the present invention is extremely versatile since it may be readily assembled and arranged by the user before mounting it into a door frame so that it will be suitable for either a left hand or right hand opening door.

It is preferable that the housing 18 of the door closure have the general rectangular configuration shown in the drawings with flat front and rear walls so that the housing may be readily positioned in a door frame channel as shown in FIG. 5 of the drawings. For the purpose of mounting the housing in the door channel, a pair of openings 96 and 98 are provided through the housing so that all that need be done is to provide openings in the channel for receiving self-tapping screws 100 or the like for retaining the housing in the door frame. As seen in FIGS. 1 and 5, the pawl 72 and ratchet wheel 38 are disposed on the housing 18 so that they are positioned below the lower edge 102 of the door frame thus permitting easy access to the spring adjusting means 71. If it is not possible to fit the housing within the channel 12, the closure mechanism 10 may be mounted on the outer wall adjacent the sliding door and the end 14 of the flexible band of the

closure mechanism may be fixed to the door through an arm, not shown, which extends at right angles outwardly from the door.

Although only one specific embodiment of the invention has been disclosed herein for purposes of illustration, it will be understood that various changes can be made in the form, details, arrangement and proportions of the various parts without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. A sliding door closure comprising:

a housing having a front wall, a back wall and at least two opposite side walls, each of said side walls having an opening therein through which a flexible band may extend;

said housing being formed of two sections with one of said sections including said front wall and the other of said sections including said back wall and means detachably holding said sections together in fixed relationship;

said front wall and said back wall having aligned openings therein;

a shaft rotatably positioned in said openings;

a reel in said housing freely surrounding said shaft;

a coil spring positioned in said reel and concentric with said shaft, one end of said spring being fixed to said shaft and the other end of said spring being fixed to said reel thereby normally urging said reel in one direction of rotation;

a flexible band wound on said reel having one end thereof fixed to said reel and the other end extending outside said housing through one of said side wall openings for connection to a sliding door;

means for adjusting the tension of said spring, said means including ratchet means fixed to said shaft at the front wall of said housing, a single pawl and means pivotally mounting said pawl on said front wall so as to engage said ratchet means;

said means pivotally mounting said pawl on said front wall being readily removable whereby said pawl may be selectively assembled into two positions to engage and prevent rotation of said ratchet means in either direction of rotation thereof; and

said biasing means urging said pawl into engagement with said ratchet means regardless of which of said two positions the pawl is disposed.

2. A sliding door closure comprising:

a rectangular housing having a flat front wall, a flat back wall and two pairs of said walls, one pair of said side walls having openings therein at the lower portions thereof through which a flexible band may extend;

said housing being formed of two sections with one of said sections including said front wall and the other of said sections including said back wall, and means detachably holding said sections together in fixed relationship;

said front wall and said back wall having aligned openings therein;

a shaft rotatably positioned in said openings;

a reel in said housing freely surrounding said shaft;

a coil spring positioned in said reel and concentric with said shaft, one end of said spring being fixed to said shaft and the other end of said spring being fixed to said reel thereby normally urging said reel in one direction of rotation;

a flexible band wound on said reel having one end thereof fixed to said reel and the other end extending outside said housing through one of said side wall openings for connection to a sliding door;

means for adjusting the tension of said spring, said means including ratchet means fixed to said shaft at the front wall of said housing and a single pawl, said

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ratchet means having a plurality of circumferentially spaced teeth, each of said teeth having side walls extending radially with respect to the axis of rotation of said shaft;

means pivotally mounting said pawl on said front wall 5 so that an end thereof engages said ratchet means between consecutive teeth of said ratchet means, said pawl mounting means being readily removable whereby said pawl may be selectively assembled into two positions to engage and prevent rotation of said ratchet means in either direction of rotation thereof; 10 and

means biasing said end of said pawl into engagement with said ratchet means regardless of which of said 15 two positions said pawl is disposed.

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