Feb. 28, 1967 LE ROY R. MALECK 3,306,645

ADJUSTABLE CLOSURE MEANS

Filed Aug. 2, 1965

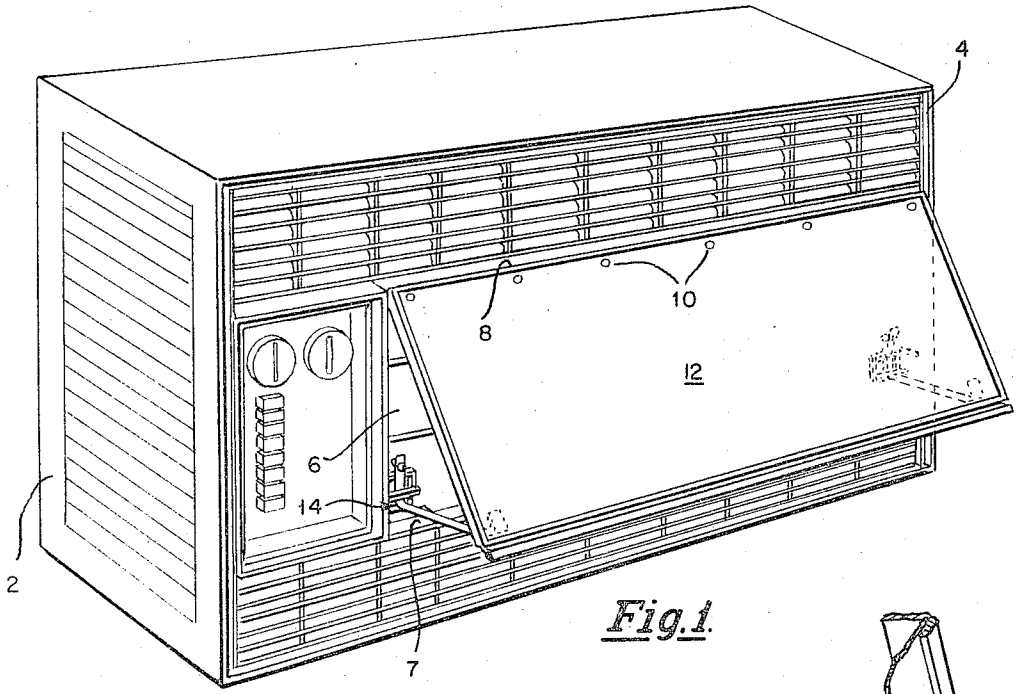


Fig. 1.

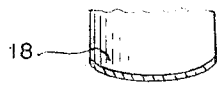


Fig. 3.

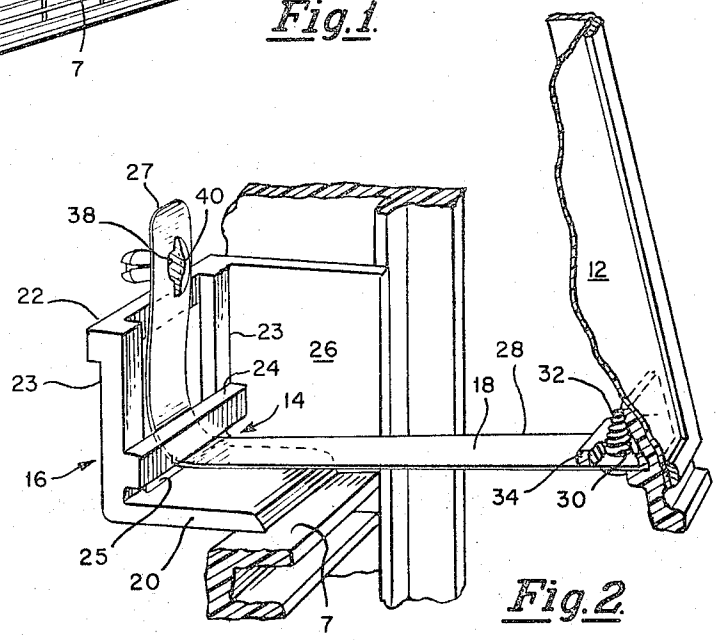
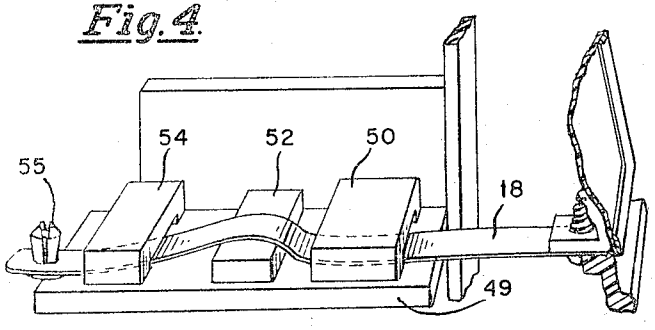


Fig. 2.

Fig. 4.



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ADJUSTABLE CLOSURE MEANS

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This invention relates in general to a manually adjustable holdfast or clasp, and in particular to a movable tape for selectively positioning and limiting the movement of a panel or doorlike closure member. More particularly, the invention is concerned with a friction clasp for retaining a hinged panel or door, such as a ventilation panel located at the front of a window-type air conditioner, in any preset position. The friction clasp is easily manufactured (a major portion preferably as a part of the frame supporting the hinged panel), is trouble free, and is not likely to rattle, wear out, or require adjustment.

It is sometimes desirable to provide a room size window air conditioner with a manually adjustable ventilation panel for varying the quantity of room air to be mixed with fresh air entering from outside the room. The ventilation panel could conceivably be retained in a preset but adjustable position by a friction type hinge, a detented latch, a rigid sliding latch, or other type of positioning device. These positioning devices are often complicated, difficult to manufacture, expensive, and in some instances offer only a limited number of adjustable positions. In addition, an important disadvantage to some positioning devices is their physical size and the additional space they require for optimum operation. The additional space is usually of some consideration in any type of functional apparatus, but it is of prime consideration in appliance design, especially window air conditioners.

This invention overcomes many of the objections and deficiencies of the heretofore mentioned positioning devices. A friction clasp type positioning device constructed in accordance with the teachings of this invention is economical, of the utmost simplicity, is easily manufactured as part of the decorative front grill, and provides the ventilation panel with an unlimited number of adjustable positions. In addition, due to its unique construction, the friction clasp is relatively small in size and requires only a very samll cabinet depth for operation. Adequate operation, despite the small depth required, is possible because of utilization of a vertical area behind the decorative grill above the friction clasp.

A friction clasp constructed in accordance with the teachings of this invention utilizes only a single moving element in addition to the ventilation panel itself. In operation, its positioning or clasping characteristics result from friction between the single moving element and a guide track, the latter being preferably formed integral with the decorative grill. The friction clasp of the yet to be described design also provides means integral therewith for limiting total panel movement.

The primary object of this invention is to provide a simple, economical, and trouble free friction clasp for retaining a hinged panel in any selected position.

Another object of this invention is to provide an improved clasp for limiting the movement of a hinged panel.

A further object of this invention is to provide a friction clasp for selectively positioning a hinged panel wherein the clasp is relatively small in depth, trouble free in operation, and resistant to noise from vibration.

A feature of this invention resides in the use of a very flexible and resilient steel tape which comprises the only moving part of the mechanism.

The primary advantage of this invention resides in the ability to reduce the horizontal depth required for adequate operation while providing a low cost, reliable friction clasp.

Other objects and advantages of this invention will become apparent upon an examination of the following description taken in conjunction with the accompanying drawings wherein:

FIG. 1 illustrates a perspective view of a window type air conditioning unit in which the present invention is included.

FIG. 2 is an enlarged perspective view of the invention wherein all hidden portions are shown by dashed lines.

FIG. 3 is an enlarged cross section of the steel tape incorporated in the invention.

FIG. 4 is an enlarged perspective view of an alternate embodiment of the invention wherein dashed lines are also used to illustrate hidden portions.

The window-type air conditioner, as will be particularly noted in FIG. 1, comprises an outer body **2** to the front of which is secured a decorative grill or frame **4**. The frame **4** defines an opening **6**, having a lower edge **7**, through which room air may be drawn for cooling and subsequent recirculation in a manner well known in the art. An upper edge **8** of opening **6** is provided with any type of commonly used hinge **10** for pivotally securing a ventilation panel **12** thereto. Ventilation panel **12** may be pivoted outwardly as shown in FIG. 1 for varying the volume of room air recirculated through the air conditioner.

A friction clasp, generally referred to by reference numeral **14**, is affixed to lower edge **7** of opening **6** for limiting the outward movement of panel **12** and selectively retaining it in any desired position. As best seen in FIG. 2, which illustrates the right hand friction clasp shown in phantom in FIG. 1, friction clasp **14** comprises a tape guide generally referred to by numeral **16** and a resilient metal tape **18** threaded therethrough. Tape guide **16** includes a base plate **20** having a forward end secured atop lower edge **7**. A back support **22** is positioned above but slightly behind the base plate and is supported by a pair of uprights **23**. Uprights **23** also support a tape retaining bar **24** positioned forwardly of the back supports and above the base plate, thereby forming a narrow window **25**. A side wall **26** is provided to insure rigidity of the tape guide and assist in fastening it to frame **4**.

Resilient tape **18** has an arcuate cross section (clearly shown in FIG. 3), which is easily deformable, identical to the steel tape commonly used in steel tape measuring reels. The resilient tape is threaded through tape guide **16** by inserting a first end **27** over the base plate and through window **25**, then deforming it substantially 90° and sliding it behind retaining bar **24** but in front of the back support. The tape is also deformed at the apex of its 90° bend and assumes a flattened rather than arcuate cross section. The tape may now be urged through the tape guide as far as necessary.

When the steel tape is threaded through the tape guide and deformed into a 90° configuration, its natural resilience attempts to restore it back to its original shape, that is, planar with an arcuate cross section. Concurrently the resilience, or energy stored within the metal upon deformation, causes the tape to exert a normal force against the base plate, back wall, and retaining bar, at the points of contact with the tape. A specific coefficient of friction also exists between the tape and the material it contacts, which tends to resist movements of the tape through the tape guide. Naturally, the tape may be moved through the guide by exerting a sufficient force on it to overcome the frictional resistance.

A second end **28** of resilient tape **18** is provided with an aperture **30** and a threaded fastener **32** for securing this end to a tab **34** protruding from panel **12**. A force exerted on panel **12**, to adjust it to another position is transmitted to the steel tape through tab **34**, and if of sufficient magnitude to overcome the resistive friction, movement is imparted to the tape.

The arcuate cross section of the tape is desirable to prevent buckling or bending of the length of tape between the tape guide and the tab. This cross section also increases the effective tape thickness, thus providing a tighter fit within the tape guide and a corresponding reduction of noise from vibration. A low noise level is especially important in a window air conditioner which depends upon rotation of a heavy motor for operation, yet is required to be relatively quiet while functioning, such as for sleeping.

First end **27** of resilient tape **18** is also provided with an aperture **38**. A rivet **40** or the like is inserted into aperture **38** after the resilient tape has been threaded through the tape guide. The rivet prevents the tape from unthreading from the guide thus limiting movement of the panel in an outward direction. When the panel is fully extended, rivet **40** abuts against the top edge of back support **22**.

In some applications of this novel friction clasp where cabinet depth is less critical than height, a second embodiment illustrated in FIG. 4 may be more desirable. This embodiment utilizes a tape guide comprising a base **49** which may also be secured to frame **4** and three support blocks. A first support block **50** is secured to the front of the frame and resilient tape **18** threaded thereunder. The resilient tape is then threaded over a second support block **52**, having a top surface slightly higher than the bottom surface of the first support block. The tape is finally threaded under a third support block **54** positioned to the rear of and slightly below the second block. After the tape is threaded through the support blocks it is slightly bowed, its cross section is flattened, and its resilience again establishes a friction which resists tape movement. A rivet **55** is provided to limit tape movement and the total operation is very similar to that of the first embodiment.

It should be understood that more than one friction clasp of either or both embodiments may be used if the movable member is of sufficient size to so require.

In either embodiment of the invention herein described a single movable element, namely the resilient tape, is required to selectively adjust a hinged panel in any desired position. Naturally, the friction clasp will keep the panel in a closed position when it is not desired to operate the air conditioner. In addition, the invention utilizes one principal element which may be molded as an integral part of the frame, and a second element which is commercially available at a low cost due to its use in the manufacture of steel tape measures.

Many modifications and alterations of the invention, far different both in appearance and details of construction from the embodiment herein illustrated but nevertheless utilizing the basic teachings of the invention, will be readily apparent or devised upon study by persons skilled in the art. Accordingly, the scope of protection to be afforded should not be limited by the particular embodiment illustrated and described, but should be determined from the description of the essence of the invention which appear in the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In combination: a panel hinged to and supported by a frame; a substantially right angle guide track including a first friction surface, a second friction surface at substantially a right angle to said first friction surface, and a retaining bar; a resilient and deformable friction member threaded for movement through said guide track; said friction member having an upper side in frictional contact with said retaining bar and a lower side in frictional contact with said first and second friction surfaces; means limiting movement of said friction member in one direction, and further means securing an end of said friction member to said panel, whereby said panel may be selectively retained in any position.

2. In combination: a panel hinged to a frame; a resilient friction member; a guide track secured to said frame for guiding said resilient friction member and including a first friction surface, a second friction surface orientated 90° thereto, and a friction member retaining bar; said resilient friction member movable through said guide track and having one side in frictional contact with said retaining bar, and an opposite side in frictional contact with said first and second friction surfaces, said friction member thereby deforming substantially 90° responsive to movement through said track; means limiting movement of said friction member in one direction for preventing unthreading thereof from said guide track; and means securing an end of said friction member to said panel whereby said panel may be selectively retained in any position.

3. In combination: a closure structure including first and second elements arranged for respective pivotal movement; a guide track secured to said first element for guiding said resilient friction member and including a first friction surface, a second friction surface orientated 90° thereto, and a friction member retaining bar; said friction member movable through said guide track and having one side in frictional contact with said retaining bar, and an opposite side in frictional contact with said first and second friction surfaces, said friction member thereby deforming substantially 90° responsive to movement through said track; means limiting movement of said friction member in one direction for preventing unthreading thereof from said guide track; and means securing an end of said friction member to said second element, whereby said first and second elements may be selectively adjusted to any number of positions relative to each other.

4. A friction tape for use in selectively supporting a hinged vent panel in an air conditioner comprising: a panel hinged to a frame; a guide track secured to said frame and including a base, a back support orientated substantially 90° to said base, and a tape retaining bar interior thereof; a resilient tape having an arcuate cross section with a first side frictionally contacting said base and said back support, and a second side frictionally contacting said retaining bar; said resilient tape also having one end secured to said panel, an opposite end including means limiting movement thereof, and a portion intermediate said ends; said intermediate portion deforming substantially 90° to conform to said guide track and movable therethrough responsive to a force applied to said panel, said tape thereby frictionally supporting said panel in any selective position.

5. A friction tape for use in selectively adjusting a hinged vent panel in an air conditioner comprising: a panel hinged to a frame; a guide track secured to said frame and including a base, a back support orientated substantially 90° to said base, and a tape retaining bar interior thereof; a tape of arcuate cross-section threaded

through said guide track against said retaining bar and having a first and extending in a vertical direction including means limiting movement thereof, a second end extending in a horizontal direction secured to said panel, and a deformable portion intermediate said first and second ends conforming substantially to said guide track; said tape having resilient properties and exerting substantially normal forces against said base and said back support thereby establishing a frictional force for resisting movement of said tape through said guide track and retaining said panel in any preset position, whereby said preset position may be varied responsive to a horizontal force on said panel of sufficient magnitude to overcome said frictional force.

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