Nov. 10, 1959 W. G. SPIEGELHALTER 2,911,899

WINDOW CLOSURE FOR ROOM AIR CONDITIONER

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FIG. 1

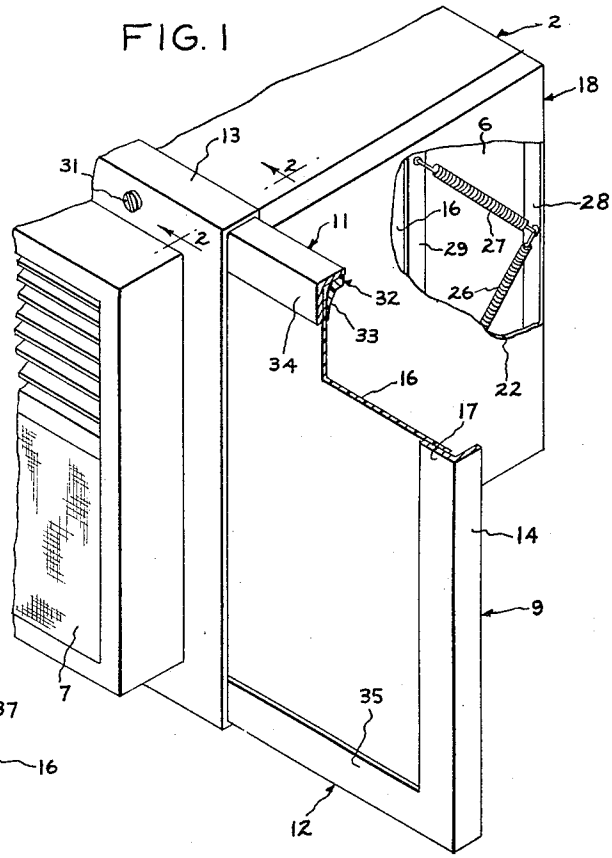


FIG. 2

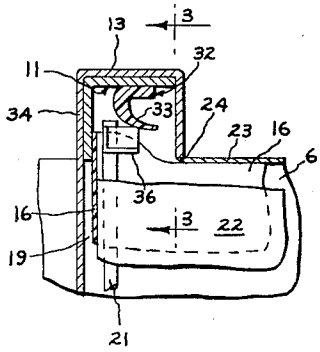


FIG. 4

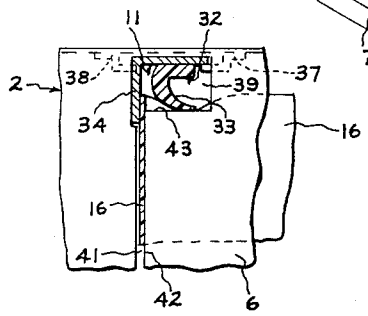
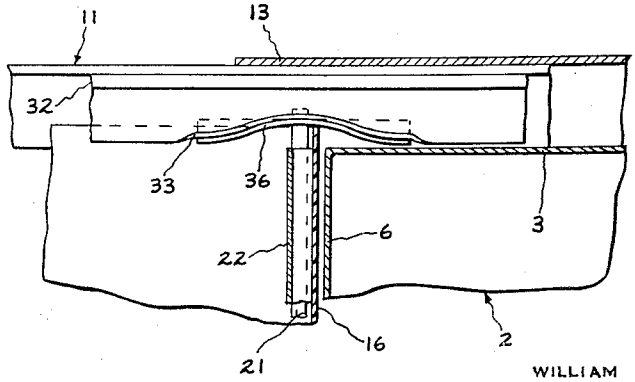


FIG. 3



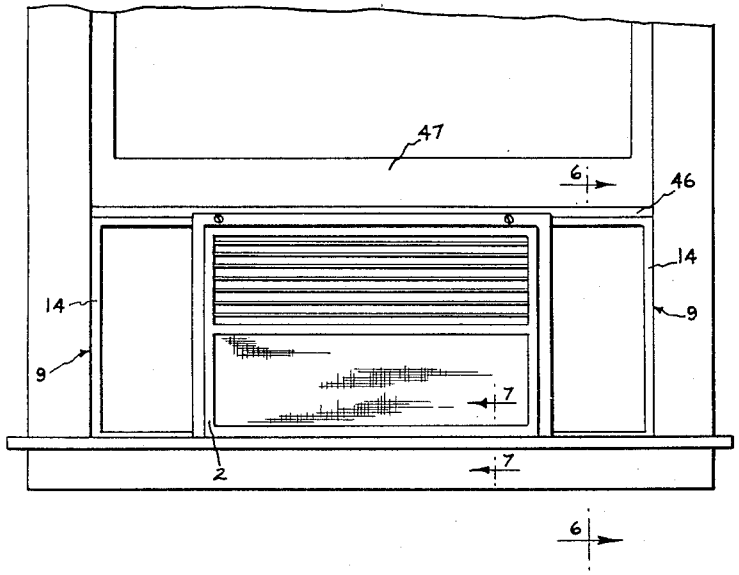
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WINDOW CLOSURE FOR ROOM AIR CONDITIONER

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FIG. 5



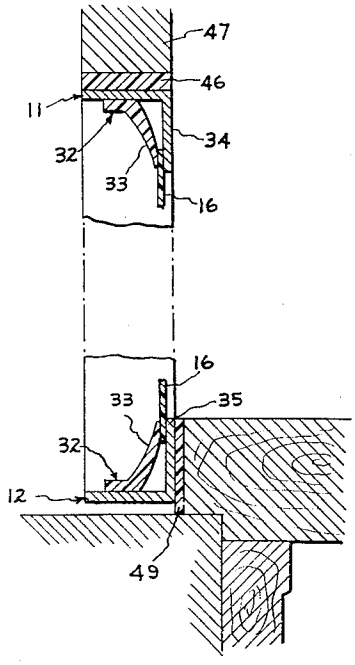
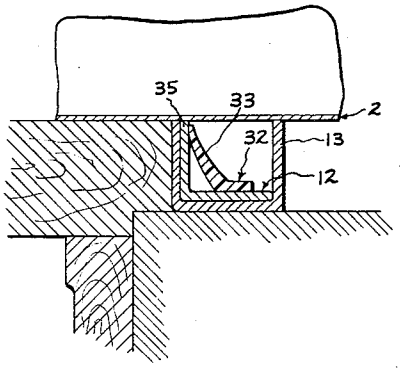


FIG. 6

FIG. 7



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WINDOW CLOSURE FOR ROOM AIR CONDITIONER

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6 Claims. (Cl. 98—94)

The present invention relates to and has as its principal object an improved closure arrangement for blocking the openings between the case of a room air conditioner and the sides of an aperture or window in the wall of a room in which the case is mounted.

A more specific object of the present invention is to provide, for closing the openings between the air conditioner case and the sides of a window, a closure arrangement in which the closure material retracts into and is stored adjacent to and parallel with the sides of the case when it is desirable to remove the conditioner from the window or when it is necessary to transport the air conditioner.

Further objects and advantages of the present invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming a part of this specification.

In carrying out the present invention there is provided on the case of a room air conditioner, an extension frame, telescopically mounted on the case, and including upper and lower horizontal arms or sections arranged to move inwardly and outwardly with respect to the case. The sections are connected at their outer ends by a vertical member which moves flush against the side of a window when the extension frame is moved to the extended position. In order to close the space between the extension frame and the case, there is provided a flexible closure means having one end attached to the vertical member. The flexible closure means moves outwardly with the extension frame to close the space between the horizontal sections and the case as the extension frame is moved away from the case. Space for storage of the flexible closure means is provided parallel to the side of the case and spring means, attached to one end of the flexible closure means cause the flexible closure means to separate from the extension frame and telescope into the storage space when the frame is moved toward the case. Thus, when the unit is mounted in a window, the excess flexible closure means is stored in the housing parallel to the sides of the case and, when the unit is removed from the window, the vertical member is moved flush against the side of the case and the closure means is stored parallel to the side of the case.

For a better understanding of the invention reference may be had to the accompanying drawings in which:

Fig. 1 is a perspective view having portions broken away to show the adjustable closure arrangement;

Fig. 2 is a cross-sectional view, taken along line 2—2 of Fig. 1, illustrating the portion of the arrangement where the closure means enters the housing;

Fig. 3 is a partial cross-sectional view taken along line 3—3 of Fig. 2;

Fig. 4 is a cross-sectional view similar to Fig. 2 showing an embodiment of the invention in which the closure material is stored within the room air conditioner case itself;

Fig. 5 is an elevation view illustrating the manner in

which an air conditioner having the closure arrangement of the present invention is mounted in a window;

Fig. 6 is a partial cross-sectional view taken along line 6—6 of Fig. 5 illustrating the sealing arrangements between the window and the window sash with the extension frame; and

Fig. 7 is a cross-sectional view taken along line 7—7 of Fig. 5 illustrating the manner in which the lower portion of the adjustable closure means rests against the lower sill of the window.

Referring now to Fig. 1, there is shown an air conditioner having the adjustable closure arrangement of the present invention arranged thereon. The air conditioner is of the self-contained type having a refrigeration system and air moving means mounted within a case or housing 2 which is adapted to be mounted in a window opening in a manner such as shown in Fig. 5. The case 2 of the air conditioner is preferably formed of suitable sheet material or the like connected to form top and bottom walls 3 (only the top wall being shown in the drawings), side faces or walls 6, a front wall 7 and a rear wall (not shown in the drawings). In operation, the rear wall is positioned externally of the window opening and the front wall 7 is positioned in the room to be air conditioned.

The air conditioning unit includes a refrigeration compressor, heat exchangers, fans and filters (none of which are shown), all of which are mounted in a suitable manner within the case 2. Suitable openings are provided in the front wall 7 through which room air is circulated into and out of the unit and in the rear wall for the circulation of outside air. Controls are preferably arranged on the front wall 7 for controlling the operation of the refrigerating and air circulating components.

In its most preferable form, the present invention comprises a pair of telescopically mounted extension frames 9 (only one shown in Fig. 1) arranged on opposite sides of the case 2. These extension frames are laterally adjustable with respect to the sides of the air conditioner to open or close the space between the sides of the conditioner and the sides of the window frame or aperture in which the conditioner is mounted. As may be seen in Fig. 1, the extension frame 9 comprises upper and lower horizontal sections 11 and 12 which are telescopically mounted in a channel housing or track member 13 attached to the case 2. Connecting at the outer ends of the horizontal sections is a vertical section or member 14 which is designed to move flush against the window frame when the sections 11 and 12 are extended from the trackway 13 and the side of the case 6. By moving the extension frame 9, a variable sized space or opening is created between the horizontal sections 11 and 12, the vertical member 14 and the side 6 of the case. In order to close this space and thereby fill the entire opening between the side of the case 6 and the side of the window there is provided a flexible closure means or material 16 having one end attached to the vertical section 14 of the extension frame 9. The closure means or material 16 is preferably formed from a reasonably flexible waterproof fabric or plastic material which is glued or riveted, or secured in any other manner well known in the art, to the flange 17 of the vertical section 14. As the extension frame 9 is moved inwardly or outwardly with respect to the side 6, the flexible closure means 16, which is firmly attached to the vertical section 14, completely fills or obstructs the variable space between the horizontal sections of the extension flange 9 and the side 6 of the case.

Obviously, when the horizontal sections 11 and 12 telescope into the trackway 13, the flexible closure means cannot continue to move laterally inward, or it will obstruct the operation of the components within the air conditioner. Therefore, according to the present invention

when the extension frame **9** is telescoped into its trackway **13**, the flexible closure means **16** separates from the frame and slides into a storage space or housing **18** disposed parallel to the side face **6** of the case **2**. As may best be seen in Fig. 2, the housing **18** contains an opening **19** which lies approximately flush with the plane of movement of the extension frame (only the section **11** of the extension frame **9** being shown in Fig. 2). During retraction of the extension frame or the section **11**, the flexible material **16** enters the opening **19** to the housing **18** and turns approximately 90° to slide into the housing **18** and parallel to the side face **6** of the case **2**.

In order to facilitate smooth entry of the flexible closure material **16** into the housing **18**, means are provided adjacent the opening of the housing around which the flexible closure material is turned into the housing. As may be easily seen in Fig. 2, the turn-around means comprises a rod **21** which lies closely adjacent the opening **19**. The rod is supported in the vertical position by the outer side **22** of the housing which wraps around the rod. The flexible material **16** enters the opening **19**, passes around the rod **21** and slides toward the rear of the unit into the housing **18**.

Still referring to Figs. 2 and 3, the vertical width of the closure material **16** is actually slightly greater than the vertical height of the housing **18** which lies flush with the upper and lower walls of the case. This is illustrated in Fig. 2 wherein the upper edge of the flexible closure material can be seen to extend above the upper wall **23** of the housing **18**. It should be understood that the bottom edge of the flexible closure material also extends below the lower wall of the housing **18**. Thus, in passing into the housing **18**, the flexible closure material **16** actually is compressed or bent over at its uppermost and lowermost edges in order to fit into the housing **18**. Since the closure material **16** is made of a highly flexible material it does not particularly damage the material to be compressed slightly in order to fit into the smaller height housing. However, in order to prevent the material from wearing, the upper wall **23** of the housing is rounded at the point **24** where it meets with the channel section or trackway **13**. It is to be understood that the lower wall (not shown) is provided with a similar rounded portion to ease the entry of flexible closure material **16** into the housing.

In order to keep the flexible closure material tightly drawn across the space or opening between sections of the extension frame **9** and the side face **6** of the case and in order to cause the flexible closure material to feed into the housing **18** when the extension frame is retracted toward the side face **6** of the case, spring means are fastened between the inner end of the flexible closure means and the rear of the housing **18** to continually exert a tensioning force on the closure means. More specifically there are shown two coil springs **26** and **27** which are attached to the rear end wall **28** of the housing **18** a point near the center of the wall. These springs diverge in the direction toward the front of the housing and are attached to a vertical support member **29** which, in turn, is secured to the other end of the flexible closure material **16**. In the illustrated embodiment of the invention, the coil springs **26** and **27** are of a length slightly less than ½ the height of the housing **18**. These springs are always maintained in tension and provide a continual component of force on the flexible closure material **16** in the direction toward the rear of the housing. Even when the extension frame **9** is entirely telescoped with the vertical member **14** disposed adjacent the side **6** and with the closure material retracted into the housing to its maximum extent, the springs **26** and **27** maintain a tension on the closure material. As the extension frame is moved away from the side face **6** and as the closure material **16** moves laterally with the frame, the other end of the material and the support member **28** move parallel with respect to the side face **6** of the housing **18** and in a direction away from the end wall **28**. Springs **26** and **27** are stretched into tension and produce a force opposed to the outward extension of the extension frame **9**.

In order to maintain the extension frame in the extended position for closing the opening between the case and the side of an aperture or window there are provided means for locking the extension frame into a particular position. More specifically, there is provided a locking screw **31** which is threaded into the trackway or channel **13** and which is tightened down on the upper horizontal section **11** when the extension frame is moved into the desired position. This wedges the upper horizontal section **11** against the opposite side of the channel **13** and prevents the component of force produced by the springs **26** and **27** from pulling the extension frame away from the side of the window.

In order to seal the upper and lower edges of the flexible closure material **16**, there are provided on the upper and lower horizontal sections **11** and **12** respectively a sealing means which seals the edges of the material with respect to the front flanges **34** and **35** of these sections. More specifically, in the embodiment shown, there is provided a longitudinal gasket **32** in each of these sections having a portion **33** arranged to force or press the edge of the flexible closure material **16** against the flanges **34** and **35** of the respective sections. Thus, in Fig. 1, the downwardly depending portion **33** pushes the upper edge of the flexible closure material **16** against the flange **34**. Gaskets **32** extend approximately the entire length of the upper and lower horizontal sections.

When the extension frame **9** is retracted it is necessary to divert the sealing portion **33** away from the closure material **16**, in order to permit the material to turn into the housing **18** without damaging either the material **16** or the resilient sealing gasket **32**. As may best be seen in Figs. 2 and 3, there is provided a diverter means **36** adjacent the turn-around rod **21** which bends the depending portion **33** of the gasket away from the upper edge of the flexible material **16** to permit the material to freely turn around the rod **21**. As the upper horizontal section **11** proceeds into the trackway **13**, the sealing end **33** of the gasket resumes its normal position against the flange **34**. This can be clearly seen in Fig. 7 with respect to the flange **35** and the lower horizontal section **12**. Only the upper gasket diverter means is shown in Figs. 2 and 3, however, it is understood that the lower sealing arrangement is exactly the same as the upper sealing arrangement except that the components are in reverse position.

Referring now to Fig. 4, there is shown a second embodiment of the present invention in which the flexible closure material **16** lies adjacent the inside face **6** of the case **2** and no outer housing is required for the storage of this material. Also, in this embodiment the trackway for the upper and lower horizontal sections is provided as an integral part of the casing **2**. Within the case there are provided track members **37** and **38** which support the horizontal sections **11** and **12** in slidable relation with respect to the case **2**. Openings **39** (only one of which is shown) are provided in the side of the case through which the horizontal sections **11** and **12** are permitted to extend and retract. These sections, as in the previous embodiment of the invention, are connected at their end portions with a vertical section or member (not shown in Fig. 4) to which the end of the flexible closure material is attached. In the side face **6** of the case there is provided a slot **41** extending the width of the case between the openings **39**. The flexible closure material **16** passes through this slot **41** during the movement of the extension frame. As the flexible closure material **16** moves into the slot **41**, it is turned and pulled rearwardly along the inner side of the side face **6** toward the rear of the case by a resilient means (not shown in Fig. 4), such as the springs utilized for pulling the flexible closure material to the rear of the housing **18** in the embodiment shown in Fig. 1. The

edge 42 of the slot is flared inwardly to provide a rounded entry area for permitting smooth movement of the flexible closure material 16 into and out of the case.

In this embodiment of the invention the sealing end or portion 33 of the gasket 32 is diverted away from the front flange 34 by the lower edge 43 of the opening 39 in the side of the case. As in the previous embodiment of the invention, when the extension frame is moved outwardly from the case, the flexible closure material 16 extends outwardly from the side 6 of the case along with the extension frame and the edges of the closure material are sealed against the front flange of the frame by means of the sealing end 33 of the gasket. The end or portion 33 of the gasket resumes its normal sealing position only a short distance from the side face 6 of the case.

An air conditioner having either of the above described arrangements for closing the space between the case and the side of a window can be mounted as is shown in Fig. 5. After the case 2 is placed in its proper position in the window, the extension frames 9 are then moved outwardly so that the vertical sections 14 abut or are flush with the sides of the window. A felt or rubber sealing member 46 is placed along the top of the upper horizontal section 11 and the trackway 13 of the unit. The window sash 47 is then lowered directly onto the sealing member to provide an air tight seal between the extension frame and the window. This may be more clearly seen in Fig. 6. When the embodiment of the invention illustrated in Fig. 1 is used, then the lower track and lower horizontal section 12 are arranged to fit into the space behind the window sill 48 with the bottom wall 4 of the case 2 resting on the window sill. This is clearly shown in Fig. 7. As may be seen in Fig. 6, a sealing member 49 of felt or other resilient material is placed along the edge of the window sill between the ends of the trackway 13 and the sides of the window for completely sealing the space between the front flange 35 of the lower horizontal section and the back of the window sill.

By the present invention there has been provided an adjustable closure arrangement for blocking the openings between the case of a room air conditioner and the sides of a window or aperture. In the present invention the closure material is extensible with respect to the case and is stored parallel to the side of the case whenever it is desirable to remove the conditioner from the window or whenever it is necessary to transport the air conditioner. Moreover, this closure arrangement, when in the unextended position, does not increase the outer dimensions of the case to any great extent since the closure material is stored parallel with and flat against the sides of the case. This is a particularly advantageous arrangement for those types of air conditioners that are presently referred to as portable and which are designed for transportation from room to room and therefore are frequently mounted and dismounted from windows or apertures of varying widths.

While in accordance with the patent statutes there has been described what at present is considered to be the preferred embodiments of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and it is, therefore, the aim of the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A window mounting arrangement for closing the space between the case of a room air conditioner and the frame of a window comprising an extension frame telescopically mounted on said case, said extension frame including upper and lower horizontal sections connecting

at their outer ends with a vertical member and arranged to move in a lateral plane toward and away from said case to encompass a variable space between said extension frame and said case, a flexible closure means attached at one end to said vertical member and arranged to extend laterally with said extension frame to close said space between said extension frame and said case during movement of said extension frame away from said case, a housing for said flexible closure means disposed parallel to the side of said case and having an opening approximately flush with the lateral plane of movement of said extension frame, spring means in said housing attached to the other end of said closure means for maintaining tension on said flexible closure means and causing said flexible closure means to retract into said housing when said frame is moved toward said case for storing said excess flexible closure means in said housing parallel to the side of said case and means for maintaining said extension frame in the extended position.

2. A window mounting arrangement for closing the space between the case of a room air conditioner and the frame of a window comprising an extension frame telescopically mounted on said case, said extension frame including upper and lower horizontal sections connected at their outer ends with a vertical member, said extension frame arranged to move in a lateral plane toward and away from said case to encompass a variable space between said extension frame and said case, flexible closure means attached at one end to said vertical member and arranged to extend laterally with said extension frame to close said space between said extension frame and said case during movement of said extension frame away from said case, sealing means in said upper and lower horizontal members for sealing the edges of said flexible closure means to said upper and lower horizontal members during movement of said extension frame away from said case, a housing for said flexible closure means disposed parallel to the side of said case and having an opening approximately flush with the lateral plane of movement of said frame, said opening being coextensive with the width of said space between said upper and lower horizontal sections for receiving said flexible closure means, spring means in said housing attached to the other end of said flexible closure means for maintaining tension on said flexible closure means and causing said flexible closure means to retract into said housing when said extension frame is moved toward said case thereby to store excess flexible closure means in said housing parallel to the side of said case and means for holding said extension frame in the extended position.

3. A window mounting arrangement for closing the space between the case of a room air conditioner and the frame of a window comprising an extension frame telescopically mounted on said case, said extension frame including upper and lower horizontal sections connecting at their outer ends with a vertical member, said extension frame arranged to move in a lateral plane toward and away from said case to encompass a variable space between said extension frame and said case, a flexible closure member attached at one end to said vertical member and arranged to extend laterally with said extension frame to close the space within said extension frame during movement of said extension frame away from said case, sealing gaskets in said upper and lower horizontal sections for sealing the edges of said flexible member during movement of said extension frame away from said case, each of said gaskets including a resilient portion for engaging the side of said flexible closure means and sealing it against a portion of said horizontal sections, a housing for said closure means disposed parallel to the side of said case and having an opening approximately flush with the lateral plane of movement of said extension frame, said opening being of sufficient vertical length to accommodate the vertical height of said flexible sealing means, means for forcing said sealing portion of said

gasket upwardly away from said flexible closure means as said extension frame is moved toward said housing, spring means in said housing attached to the other end of said flexible closure means for maintaining tension on said flexible closure means and causing said flexible closure means to retract into said housing when said frame is moved toward said case for storing excess flexible closure means in said housing parallel to the side of said case and means for holding said extension frame in the extended position.

4. A window mounting arrangement for closing the space between the case of a room air conditioner and the frame of a window comprising an extension frame telescopically mounted on said case, said extension frame including upper and lower horizontal sections connecting at their outer ends with a vertical member and arranged to move in a lateral plane toward and away from said case to encompass a variable space between said extension frame and said case, a flexible closure means attached at one end to said vertical member and arranged to extend laterally with said extension frame to close said space between said extension frame and said case during movement of said extension frame away from said case, a housing for said flexible closure means disposed parallel to the side of said case and having an opening approximately flush with the lateral plane of movement of said extension frame, means in said opening around which said flexible closure means is directed into said housing, spring means in said housing attached to the other end of said closure means for maintaining tension on said flexible closure means and causing said flexible closure means to retract into said housing when said frame is moved toward said case for storing said excess flexible closure means in said housing parallel to the sides of said case and means for maintaining said extension frame in the extended position.

5. A window mounting arrangement for closing the space between the case of a room air conditioner and the frame of a window comprising an extension frame telescopically mounted on said case, said extension frame including upper and lower horizontal sections connected at their ends by a vertical section and arranged to move in a lateral plane toward and away from said case to encompass a variable space between said sections and said case, a flexible closure means attached at one end to said vertical section and arranged to extend laterally with said extension frame to close said space between said sections of said extension frame and said case, said case of said room air conditioner having a slot therein disposed approximately parallel and flush with the lateral plane of movement of said extension frame, said slot being sufficient vertical length to receive the vertical height of said flexible closure means, spring means within said case attached to the other end of said flexible closure means for maintaining tension on said flexible closure means and causing said flexible closure means to move parallel to the side of said case whereby during movement of said extension frame toward said case the excess flexible closure means is retracted through said slot in said case and is stored parallel with the side of said case and means for locking said extension frame in the extended position flush against the side of the window frame.

6. A window mounting arrangement as specified in claim 5 in which the side of said slot in the case is flared inwardly to provide a rounded edge for feeding said flexible closure means outwardly and inwardly through said slot.

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