Nov. 10, 1953 D. ENGEL 2,658,570

COMBINED VACUUM SEALED WINDOW AND VENETIAN BLIND HOUSING

Filed Nov. 8, 1951 2 Sheets-Sheet 1

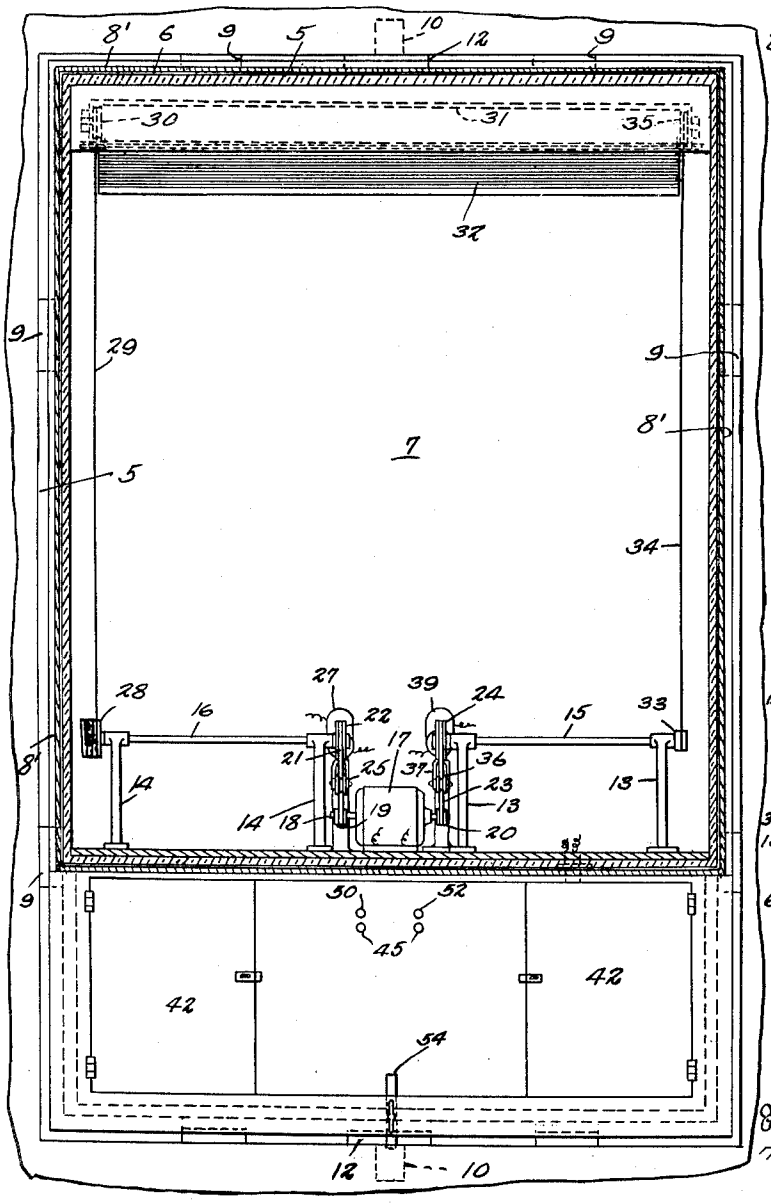

Fig. 1.

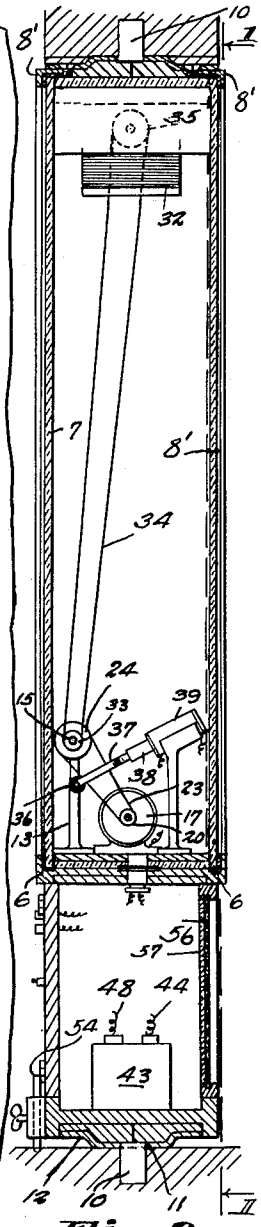

Fig. 2.

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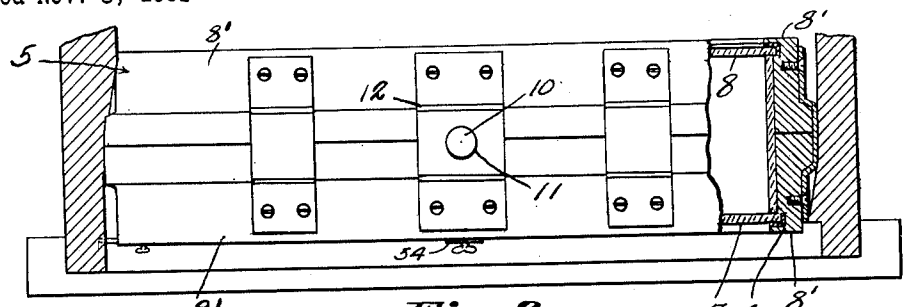

Fig. 3.

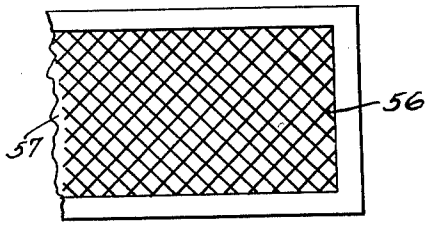

Fig. 4.

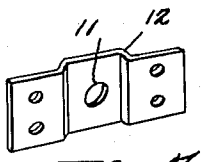

Fig. 7.

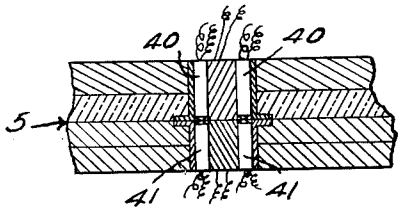

Fig. 5.

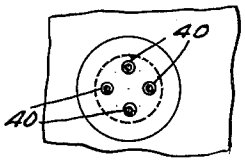

Fig. 6.

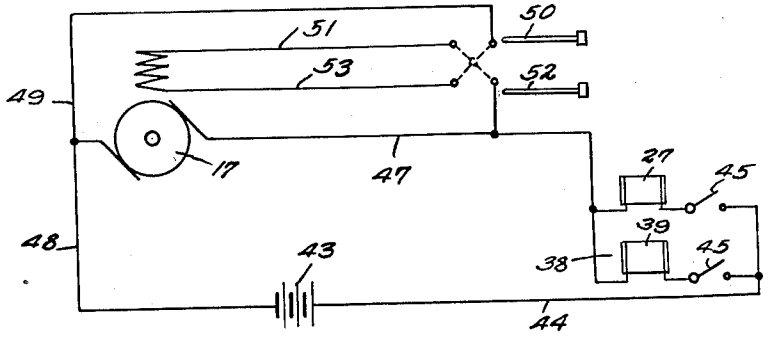

Fig. 8.

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Patented Nov. 10, 1953

2,658,570

UNITED STATES PATENT OFFICE

2,658,570

COMBINED VACUUM SEALED WINDOW AND VENETIAN BLIND HOUSING

David Engel, Uniontown, Pa.

Application November 8, 1951, Serial No. 255,414

1 Claim. (Cl. 160—168)

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This invention relates to window construction, the primary object of the invention being to provide a window of box-like form, so constructed and arranged that a conventional Venetian blind may be housed therein, thereby protecting the slats of the Venetian blind against dust, condensation and other foreign matter, to the end that the Venetian blind will be maintained in a clean condition at all times.

An important object of the invention is to provide a window which is constructed to provide a vacuum sealed chamber in which the electrical operating means for operating the Venetian blind is also supported within the vacuum sealed chamber, to the end that the window is insulated against heat and cold, the Venetian blind providing means to protect the window against heat radiation, caused by sun rays striking the window panes.

Still another important object of the invention is to provide a vacuum sealed window embodying spaced members between which a Venetian blind is mounted, the window being supported on vertical pivots for rotation in a horizontal plane to permit the window to be opened as desired.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claim, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings,

Figure 1 is a vertical sectional view through the upper portion of a window, constructed in accordance with the invention, illustrating a Venetian blind supported therein.

Fig. 2 is a vertical sectional view through the window construction.

Fig. 3 is a transverse sectional view through the frame of the window, a portion of the window being shown in section to illustrate the interior structure thereof.

Fig. 4 illustrates the grill which encloses one side of the lower portion of the window construction.

Fig. 5 is a fragmental sectional view illustrating the electrical connections between the stationary contacts and movable contacts of the window through which electric current passes to the operating motor.

Fig. 6 is an elevational view illustrating the contacts between the movable window and the stationary window frame.

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Fig. 7 is a perspective view of one of the bearing clips in which the window bearing pins operate.

Fig. 8 is a diagram illustrating the electrical circuits to the operating means of the device.

Referring to the drawings in detail, the window comprises a substantially wide sash indicated generally by the reference character 5, the edges of the sash being formed with the rabbet 6 for the reception of the window panes 7 and 8, which are disposed at opposite sides of the sash, suitable insulating and securing means such as plastic or the like being positioned within the rabbbet for engagement with the window panes to secure the window panes within the window sash in such a way as to provide a vacuum seal for the window panes.

The reference character 8' indicates clamps which are used to engage the edges of the window panes and clamp them in position within the rabbet of the window sash, as clearly shown by Fig. 3 of the drawings.

Brackets 9 are bolted to the clips 8' and connect the clips 8' at opposite side edges of the window sash. Pivot pins 10 extend from the upper and lower bars of the window sash at points intermediate the ends thereof, the pivot pins operating in the openings 11 of the bearing clips 12 which are secured within the window sash opening.

Mounted within the window at the base thereof, are upstanding bearing arms 13 and 14, the bearing arms 13 providing bearings for the shaft 15 while the bearing arms 14 provide bearings for the shaft 16. The inner bearing arms 13 and 14 are spaced apart providing a clearance for the electric motor indicated at 17 which is mounted within the window, the electric motor having its shaft 18 extended through the ends of the motor housing, where the shaft supports the pulleys 19 and 20. The belt 21 operates over the pulley 19 and then passes over the pulley 22 mounted on one end of the shaft 16, so that rotary movement is transmitted to the pulley 22 and shaft 16. Operating over the pulley 20, is the belt 23 that operates over the pulley 24, the pulley 24 being secured to the inner end of the shaft 15 to rotate the shaft 15 as desired.

Associated with the belt 21, is the idle pulley 25 that is supported on the arm 26 providing an extension of the core of the solenoid 27, and since under normal conditions, the belt 21 is loose to normally slide over the pulley 22, it will be obvious that when the solenoid 27 is energized, the idle pulley 25 will be drawn into close engagement with the belt 21 tightening the belt

so that movement will be transmitted to the shaft 16, through said belt.

At the outer end of the shaft 16 is the drum 28 on which the cord 29 winds when it is desired to raise the Venetian blind. As shown, the cord 29 extends over the pulley 30 mounted on one end of the bar 31, which provides the supporting bar for the Venetian blind indicated generally by the reference character 32, the cord passing through openings in the slats of the Venetian blind, where it connects with the lowermost slat or bar of the Venetian blind to the end that as the cord 29 is wound on the drum 28 the slats of the Venetian blind will be elevated and caused to pile one upon another in the usual and well known manner.

Secured to one end of the shaft 15, is the pulley 33 over which the cord 34 operates, the pulley 33 being substantially smaller than the drum 28 since the cord 34 is so constructed and arranged that it will tilt the supporting bar 31 of the Venetian blind to move the slats of the Venetian blind to their open or closed positions, as desired. As shown, the cord is in loop form and operates over the pulley 35 secured to one end of the supporting bar.

The belt 23 which transmits motion from the pulley 20 to the pulley 24 is normally loose to slip over the pulleys and will not under normal conditions, operate to rotate the shaft 25. Mounted adjacent to the belt 23, is the idle pulley 36 which engages the belt to tighten the belt and cause the belt to frictionally engage the pulley 24 to transmit movement to the pulley and shaft 15.

The idle pulley 36 is mounted on the arm 37 that forms an extension on the core 38 of the solenoid 39 so that by completing the circuit to the solenoid 39, the belt may be tensioned for operation.

Since the window is mounted for rotation within its frame proper, contact pins 40 extend through the bottom of the window structure, and contact with the contact pins 41 that extend upwardly though the frame proper so that electric current may pass through the contact pins 40 and 41 to the solenoids and motor.

Formed directly below the lower bar of the window is a compartment which is closed by means of the doors 42, in which the battery and switches of the device are mounted, the battery being illustrated by the reference character 43 and is in circuit with the solenoids 27 and 39 through the wire 44 and switches 45.

The solenoids 27 and 39 are in circuit with the motor 17 through the wire 47.

The wire 48 provides a circuit between the battery and motor, while the wire 49 provides a circuit between the motor and switch 50, the switch 50 being in circuit with the motor through the wire 51, and is so arranged that it will cause the rotation of the motor in one direction. The switch 52 is in circuit with the motor 17, through the wire 53 and is so arranged that when the circuit is completed through the switch 52, the

motor will operate in the opposite direction, one direction being to provide rotation of the motor to elevate or raise the Venetian blind, while the motor operating in the opposite direction will operate to lower the Venetian blind.

The window is equipped with the sliding bolt 54 whereby the window may be bolted against pivotal movement within its frame.

The compartment formed below the lower bar of the window and which has one side thereof closed by the doors 42, may be ventilated by opening said doors 42. The compartment has its opposite side closed by the grill 56, which is provided with the strip of fiber glass 57 on the rear of the grill.

From the foregoing it will be seen that due to the construction shown and described, I have provided a window which is mounted for pivotal movement within its frame, the window embodying a box-like body portion wherein the window panes are spaced apart and secured within the frame in such a way as to provide a vacuum seal between the window panes and frame. The Venetian blind is mounted within the vacuum chamber formed between the window panes to protect the slats of the Venetian blind against dust, condensation or other foreign matter to maintain the Venetian blind clean at all times. In addition, it will be obvious that due to the construction of the window, the window will be insulated and the Venetian blind mounted within the window may be operated to dissipate heat caused by radiation.

Having thus described the invention, what is claimed is:

A Venetian blind operating mechanism comprising stationary vertical bearing arms, horizontal shafts axially aligned, mounted in the bearings of the vertical bearing arms, an electric motor mounted within the space between said adjacent ends of the shafts, belts operating between the motor and horizontal shafts rotating said horizontal shafts, a lifting pulley secured to one of said shafts, a lifting cord operated by said pulley adapted to move the slats vertically, a slat tilting means including a pulley secured to the other shaft, and a slat tilting cord operating over said pulley of the slat tilting means, a normally loose inactive belt adapted to transmit rotary movement from said motor to the latter shaft and pulley, and electrically controlled means for tightening said normally loose belt on the pulley of the slat tilting means, operating said slot tilting pulley.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,301,454	Kerr	Apr. 22, 1919
2,415,222	Spencer	Feb. 4, 1947
2,566,640	Smith	Sept. 4, 1951