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(19) **United States**(12) **Patent Application Publication** (10) **Pub. No.: US 2006/0014485 A1****Sousa et al.**(43) **Pub. Date:****Jan. 19, 2006**(54) **SINGLE PIECE VANE KNOB**(75) Inventors: **Helder T. Sousa**, Toronto (CA);
Geoffrey H. Bowler, Ballantrae (CA);
Karel Caslavsky, Toronto (CA); **Iuliu**
V. Dinescu, Aurora (CA); **Thomas**
Woegerer, Plaggrave (CA)

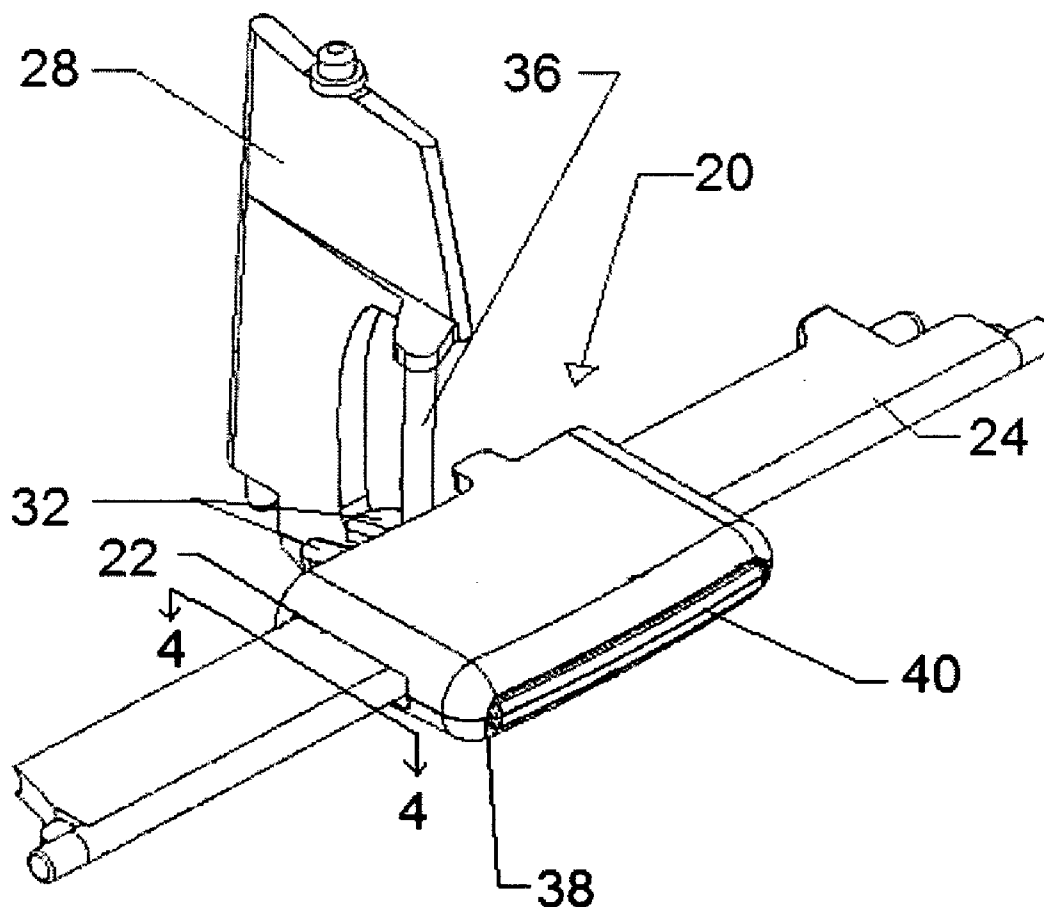
Correspondence Address:

LANG MICHENER
BCE PLACE, P.O. BOX 747
SUITE 2500, 181 BAY STREET
TORONTO, ON M5J 2T7 (CA)(73) Assignee: **Progressive Moulded Products Limited**(21) Appl. No.: **11/176,238**(22) Filed: **Jul. 8, 2005**(30) **Foreign Application Priority Data**

Jul. 15, 2004 (CA) 2,474,315

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F24F 13/06 (2006.01)(52) **U.S. Cl.** **454/315**(57) **ABSTRACT**

A closed control knob for a vent having vanes and louvers includes a resilient member integrally molded within the control knob. The resilient member acts between the control knob and the louver on which it is mounted to provide a frictional force to retain the knob in the position it is placed by a passenger in a vehicle of other user. By integrally forming the resilient member with the control knob, assembly is simplified and failure of glued, snapped or welded joints is avoided.



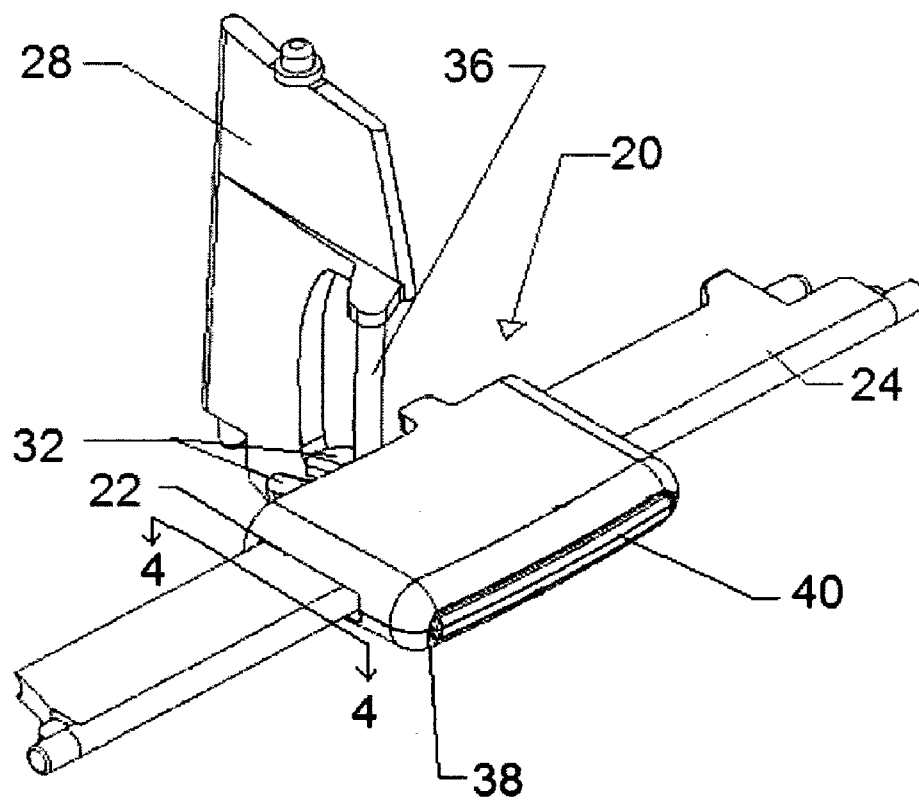


Fig. 1

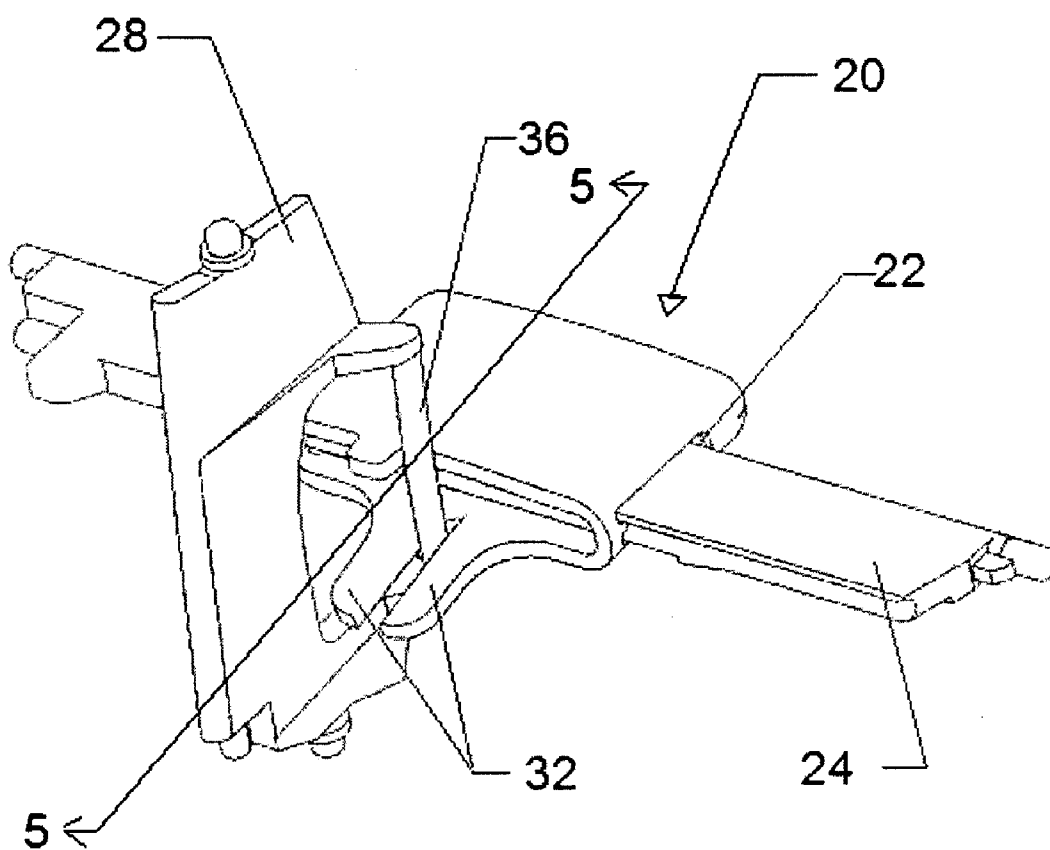


Fig. 2

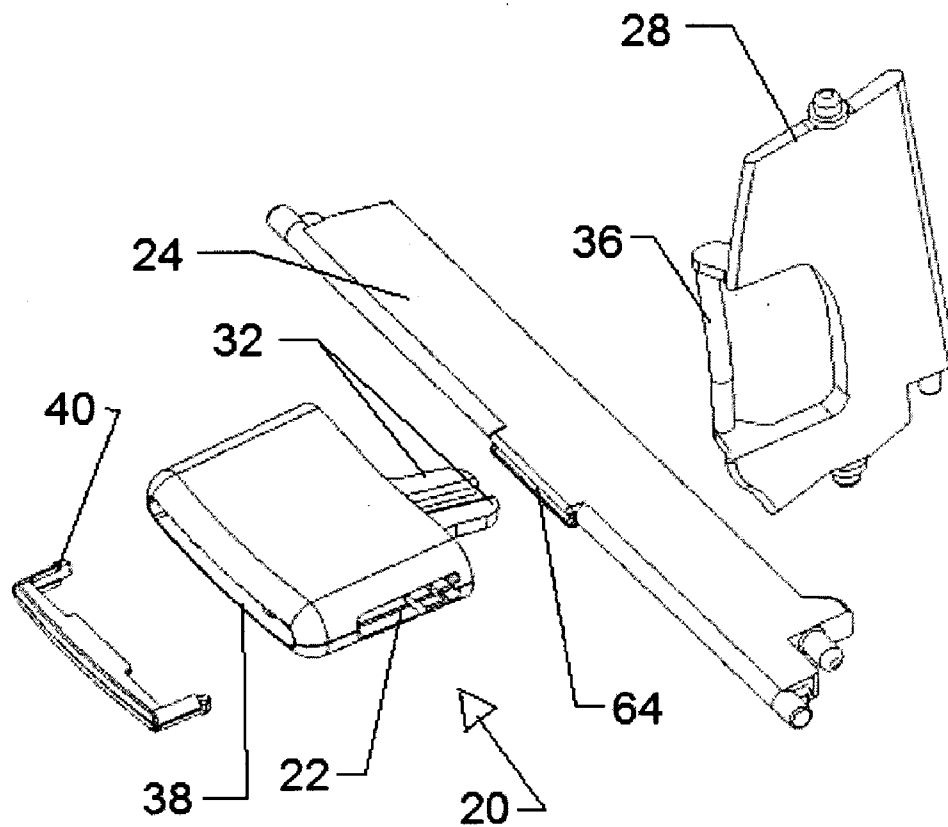


Fig. 3

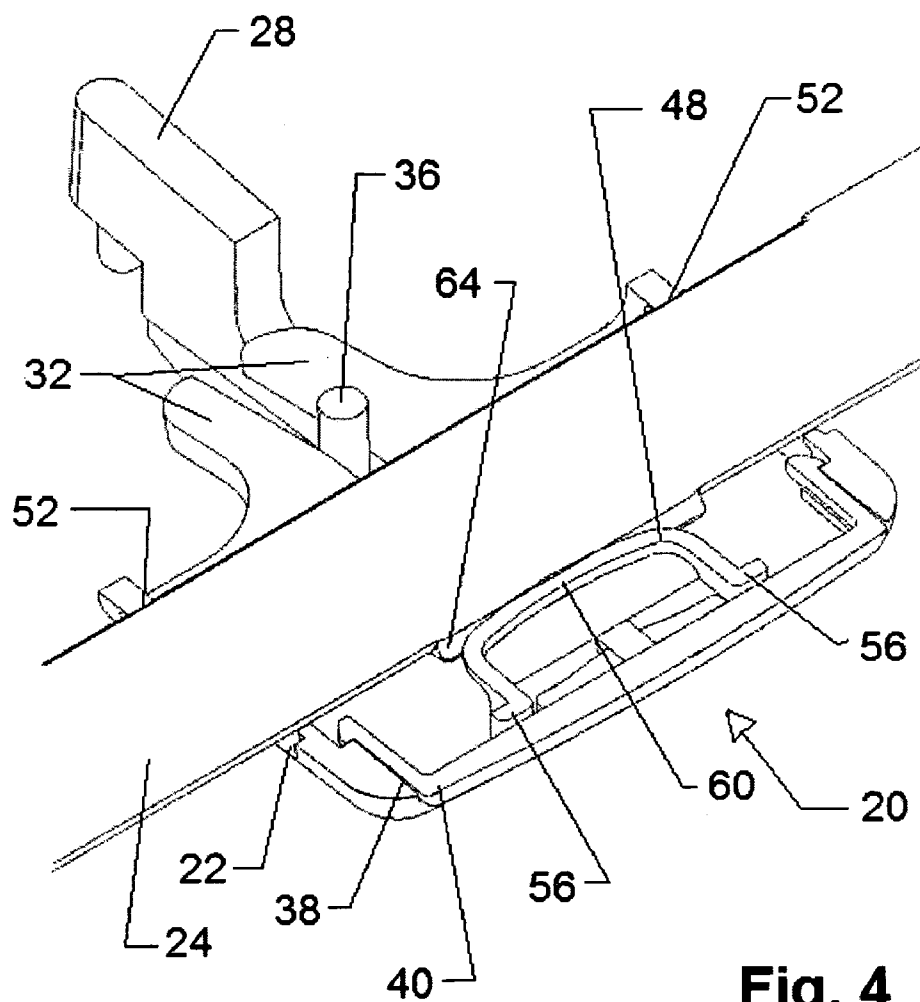


Fig. 4

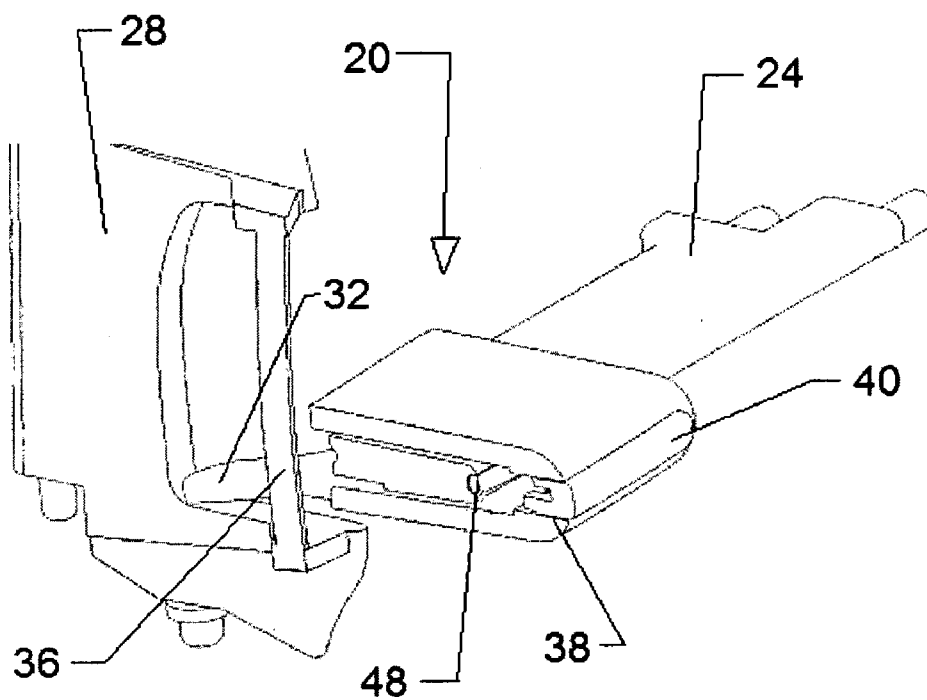


Fig. 5

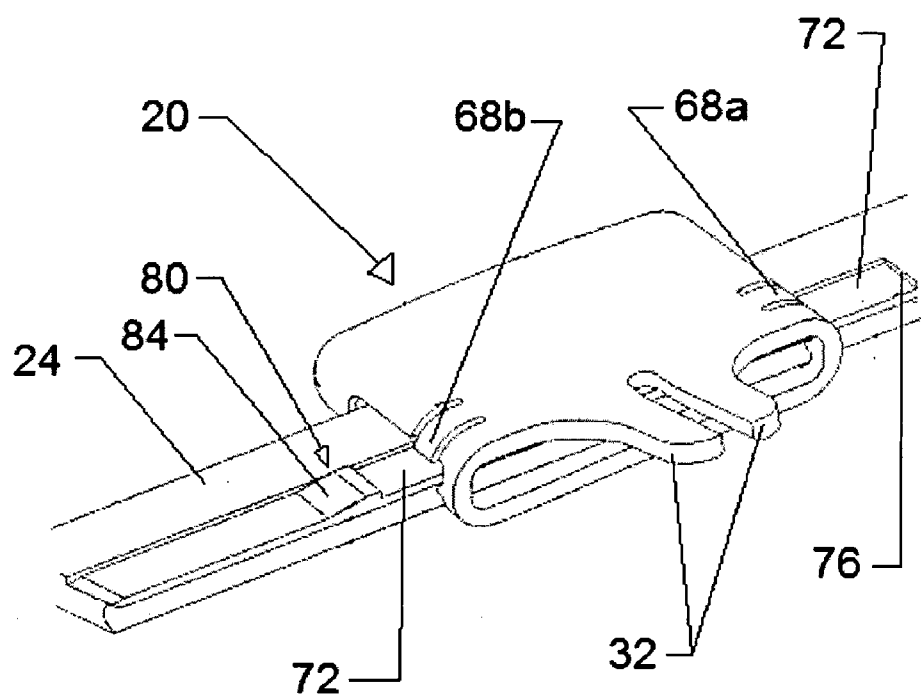


Fig. 6

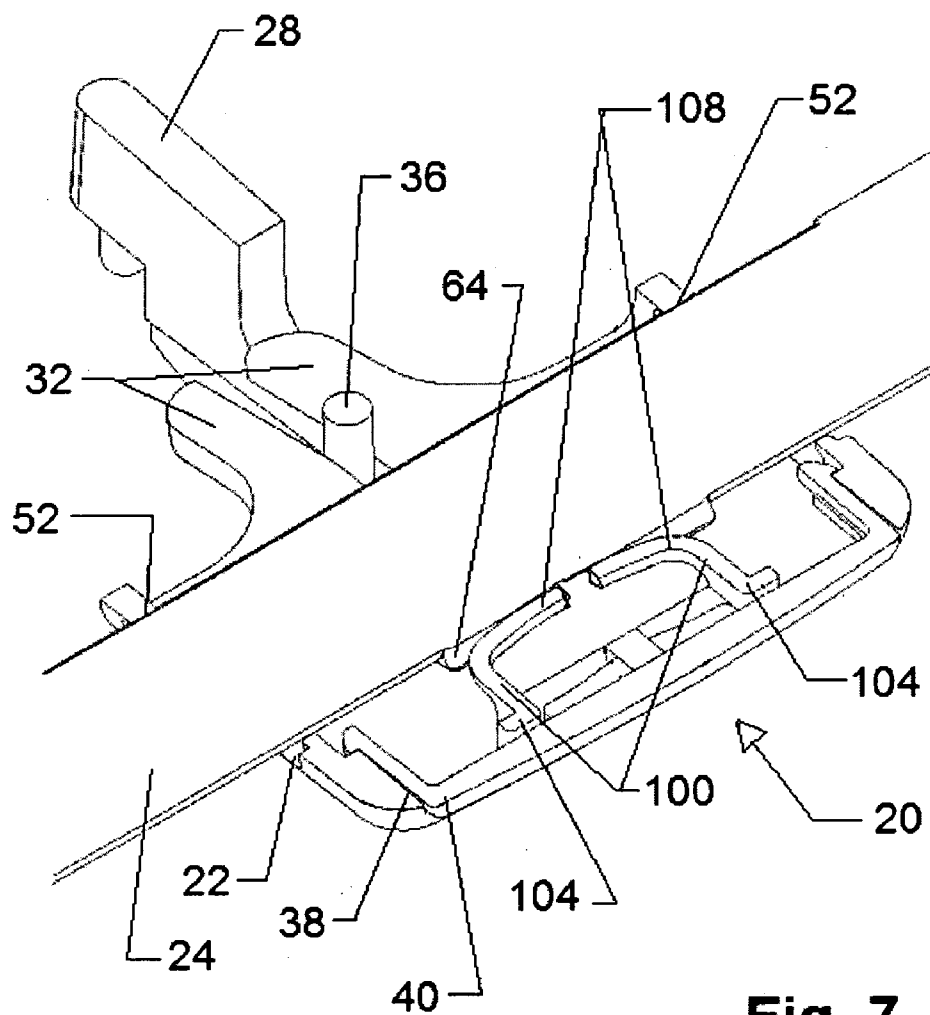


Fig. 7

SINGLE PIECE VANE KNOB

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application is related to the applicants' Canadian application 2,474,315 filed Jul. 15, 2004 and claims priority therefrom.

FIELD OF THE INVENTION

[0002] The present invention relates to a control knob for vents in automotive ventilation systems. More specifically, the present invention relates to a closed control knob for vents, which closed control knob can be constructed as a single, molded piece with an integral resilient member.

BACKGROUND OF THE INVENTION

[0003] Automotive ventilation systems typically include one or more vents with vertical vanes and horizontal louvers which can be adjusted by a passenger to direct the airflow from the vent in a desired direction and/or which can, in some cases, be closed to block the airflow from the vent. The designers and stylists of automotive interiors have several concerns when designing a vent, namely: ease of operation; appearance; reliability; and the cost of assembly and manufacture of the vent.

[0004] A design which is commonly employed to control vents is a closed control knob which has a passage to slidably receive a center louver across the front of the vent and which has fingers which extend into the vent to engage a central vane therein. The louvers of the vent are interconnected to each other such that moving the center louver moves the other louvers a similar amount and the vanes of the vent are interconnected in a similar fashion such that movement of the center vane moves the other vanes by a similar amount. The fingers of the knob engage the center vane such that, left or right movement of the knob along the center louver turns the center vane and correspondingly turns all of the vanes left or right. Further, by moving the knob up or down to tilt the center louver up or down, the other louvers are correspondingly tilted up or down.

[0005] While this design is widely employed in the automotive industry, it suffers from disadvantages. In particular, as it is desired that the vanes and louvers of the vent remain in position, once adjusted by a passenger, it is necessary to provide a degree of frictional resistance to movement of the knob along the louver. To date, such frictional resistance has been provided by a metal spring or other separate resilient member which acts between the knob and the louver. However, when such a spring or resilient member is employed with the knob, the spring and/or resilient member must be assembled into the knob, which increases the cost of the vent. Further, such knobs must be assembled from two or more components to permit installation of the spring or resilient member into the knob and this can lead to failure of the knob assembly at one or more of the assembly joints if a glued, snapped or welded joint fails.

[0006] Further, if the spring or resilient member acts against the top or bottom side of the louver, rather than against an edge of the louver, a visible track, groove or other non-aesthetic feature must be formed on the louver, resulting in a vent which is less attractive than may be desired.

[0007] Previous attempts to overcome the disadvantages of requiring a separate spring or resilient member have been open knob designs, wherein the knob is generally U-shaped, having an open side into which the louver is snapped to engage the knob. These open knob designs have included an integrally formed spring but such previous solutions have not been well received as it is possible in use to detach the knob from the louver, by a user applying too much pressure to the knob, resulting in failure of the knob and vent.

SUMMARY OF THE INVENTION

[0008] It is an object of the present invention to provide a novel closed control knob for a vent which obviates or mitigates at least one disadvantage of the prior art.

[0009] According to a first aspect of the present invention, there is provided a closed control knob for controlling vanes and louvers in a vent, the control knob comprising: an enclosed passage through which a louver to be controlled can slidably extend; a pair of fingers extending from said control knob to engage at least one vane to be controlled; a resilient member, integrally formed with said control knob, to act between said control knob and said louver to generate a frictional force therebetween, the frictional force acting to maintain the control knob in its current position on said louver; and an aperture to allow said resilient member to be integrally molded with said control knob.

[0010] Preferably, the resilient member comprises a generally bow-shaped member, the ends of the bow-shaped member being connected to the control knob and the portion of the member between the ends being cantilevered therefrom and being resiliently deformable to act between the control knob and the louver.

[0011] The present invention provides a control knob for a vent having vanes and louvers includes a resilient member integrally molded within the control knob. The resilient member acts between the control knob and the louver on which it is mounted to provide a frictional force to retain the knob in the position it is placed by a passenger in a vehicle of other user. By integrally forming the resilient member with the control knob, assembly is simplified and failure of glued, snapped or welded joints is avoided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Preferred embodiments of the present invention will now be described, by way of example only, with reference to the attached Figures, wherein:

[0013] FIG. 1 shows a perspective view of the front and side of a single piece closed control knob on a center louver and vane of a vent in accordance with an embodiment of the present invention;

[0014] FIG. 2 shows a perspective view of the back and top of the single piece control knob and louver and vane of FIG. 1;

[0015] FIG. 3 shows a perspective exploded view of the top and front of the single piece control knob and louver and vane of FIG. 1;

[0016] FIG. 4 shows a sectional view taken along line 4-4 of FIG. 1;

[0017] FIG. 5 shows a sectional view taken along line 5-5 of FIG. 2;

[0018] FIG. 6 shows a perspective view of the underside of the single piece control knob and louver of FIG. 1; and

[0019] FIG. 7 shows a sectional view similar to that of FIG. 4 of another embodiment of the present invention with two resilient members.

DETAILED DESCRIPTION OF THE INVENTION

[0020] A vent control knob with an integral resilient member in accordance with the present invention is indicated generally at 20 in FIGS. 1, 2 and 3. As illustrated, control knob 20 has an enclosed passage 22 through which louver 24 passes and is thus a closed control knob. A vane 28 is connected to control knob 20 via a pair of fingers 32 extending rearwardly from knob 20 and engaging a rod 36 connected to vane 28. Control knob 20 includes an aperture 38 extending therethrough and the front of which can be closed with a trim or accent piece, such as chromed insert 40, for aesthetic reasons. Aperture 38 permits a resilient member, discussed below, to be integrally molded within knob 20. Control knob 20 can be slid along louver 24 to move rod 36, and thus turn vane 28, and the other vanes (not shown), as desired.

[0021] As best seen in FIGS. 4 and 5, passage 22, through control knob 20, includes an integrally formed resilient member, in this embodiment spring 48, which acts between control knob 20 and the front of louver 24 and which forces louver 24 against a pair of bosses 52 located one at each end of passage 22. Spring 48 is generally bow-shaped with the ends 56 of the bow being attached to control knob 20 and the center bow portion 60 being cantilevered out from ends 56 such that center bow portion 60 is resiliently deformed when louver 24 is inserted into passage 22, as described below.

[0022] In conjunction with the frictional force generated between the center bow portion 60 of spring 48 and the front of louver 24 and between louver 24 and bosses 52, spring 48 creates a frictional force to maintain control knob 20 in the position it is placed in by a passenger using control knob 20 to adjust a vent. To enhance the feel and operation of control knob 20, louver 24 preferably includes a raised track portion 64, best seen in FIGS. 3 and 4, along its front edge for the center bow portion 60 of spring 48 to act against and which also serves to limit the portions of knob 20 which actually contact louver 24, thus assisting in preventing movement of knob 20 along louver 24 from scratching portions of louver 24 which would be visible to users. Track portion 64 is shorter in length than the width of control knob 20 so that track portion 64 is not visible to vehicle passengers as it is always located within control knob 20.

[0023] As will be apparent to those of skill in the art, control knob 20, including a resilient member, such as spring 48, can be molded as an integral member avoiding the need for a separate step of assembling spring 48 within control knob 20 and avoiding the need for a separate assembly step and/or the need for welded, snapped together or glued joints in control knob 20.

[0024] As will also be apparent to those of skill in the art, the resilient member can be formed in a variety of manners without departing from the scope of the present invention. For example, one or more cantilevered resilient arms can be formed within control knob 20 to act between control knob 20 and louver 24.

[0025] As shown in FIG. 6, control knob 20 includes a spring tab 68a and 68b on each opposed edge of its underside and spring tabs 68a, 68b run in a track 72, which is formed, on the underside of louver 24. One end of track 72 includes an end stop 76 against which spring tab 68a on control knob 20 will abut to prevent further movement of control knob 20 in that direction. The other end of track 72 includes a second end stop 80 which spring tab 68b will abut to prevent further movement of control knob 20 in that direction.

[0026] As shown, end stop 80 includes a ramped back portion 84 to allow assembly of control knob 20 onto louver 24. Specifically, during assembly louver 24 is slid into passage 22 of control knob 20, from right to left in the orientation shown in FIG. 6, such that first spring tab 68a rides up ramp portion 84 of end stop 80 and then snaps down into track 72, and as louver 24 is further inserted into passage 22, spring tab 68b will ride up ramped portion 84 of end stop 80 and then snap down into track 72.

[0027] Once louver 24 has been inserted into passage 22 to the extent wherein both spring tabs 68a and 68b are in track 72, control knob 20 can be moved horizontally along track 72 within a range limited by a respective spring tab 68a, 68b abutting a respective end stop 76, 80.

[0028] FIG. 7 shows another embodiment of the present invention which includes two resilient members 100. Each member 100 has a first end 104 fixed to control knob 20 and a cantilevered end 108 which acts against louver 24. As will be apparent, the actual shape of members 100 is not particularly limited provided that cantilevered ends 108 are resiliently biased against louver 24.

[0029] As will be apparent to those of skill in the art, while the embodiment illustrated herein has control knob 20 mounted to a horizontal louver, the present invention is not so limited and can be advantageously employed with vents with vertical louvers and horizontal vanes, or in other configurations as desired.

[0030] By incorporating a molded resilient member within control knob 20 to provide a frictional force between control knob 20 and louver 24, an advantageous vent control knob is obtained. Fabrication and assembly are simplified as it is not required to mount a spring or resilient member inside the control knob, nor is it required to glue, snap or weld a multi-part knob together. Further, as the resulting control knob is a single piece, it is more reliable than multi-piece knobs.

[0031] The above-described embodiments of the invention are intended to be examples of the present invention and alterations and modifications may be effected thereto, by those of skill in the art, without departing from the scope of the invention which is defined solely by the claims appended hereto.

We claim:

1. A closed control knob for controlling vanes and louvers in a vent, the control knob comprising:

an enclosed passage through which a louver to be controlled can slidably extend;

a pair of fingers extending from said control knob to engage at least one vane to be controlled;

a resilient member, integrally formed with said control knob, to act between said control knob and said louver to generate a frictional force therebetween, the frictional force acting to maintain the control knob in its current position on said louver; and

an aperture to allow said resilient member to be integrally molded with said control knob.

2. The closed control knob of claim 1 wherein said resilient member acts between the closed control knob and the front of the louver.

3. The closed control knob of claim 2 wherein said resilient member comprises a generally bow-shaped member, the ends of said bow-shaped member being connected to said control knob and the portion of the member between said ends being cantilevered therefrom and being resiliently deformable to act between said control knob and said louver.

4. The closed control knob of claim 3 wherein said portion of said resilient member between said ends engages a track on an edge of said louver to enhance frictional forces developed between the resilient member and the louver.

5. The closed control knob of claim 1 further including a pair of spring tabs, one on each side of said knob, said spring tabs engaging a track on a side of said louver, the track including a pair of spaced end stops and each spring tab abutting a respective one end stop at a respective end of

intended movement of said closed control knob along said track to limit movement of said control knob along said louver.

6. The closed control knob of claim 5 wherein one of said end stops includes a ramp portion over which said spring tabs can ride to enter said track during assembly.

7. The closed control knob of claim 1 further including an accent piece mounted in said aperture.

8. The closed control knob of claim 2 comprising at least two resilient members.

9. The closed control knob of claim 8 wherein each of said at least two resilient members comprises a cantilevered arm extending from said closed control knob to abut said louver.

10. The closed control knob of claim 3 further including a pair of spring tabs, one on each side of said knob, said spring tabs engaging a track on a side of said louver, the track including a pair of spaced end stops and each spring tab abutting a respective one end stop at a respective end of intended movement of said closed control knob along said track to limit movement of said control knob along said louver.

11. The closed control knob of claim 10 wherein one of said end stops includes a ramp portion over which said spring tabs can ride to enter said track during assembly.

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