Jan. 31, 1967 A. H. EBERHART 3,301,164

HINGED POLYPROPYLENE LOUVER SET

Filed Nov. 18, 1964 2 Sheets-Sheet 1

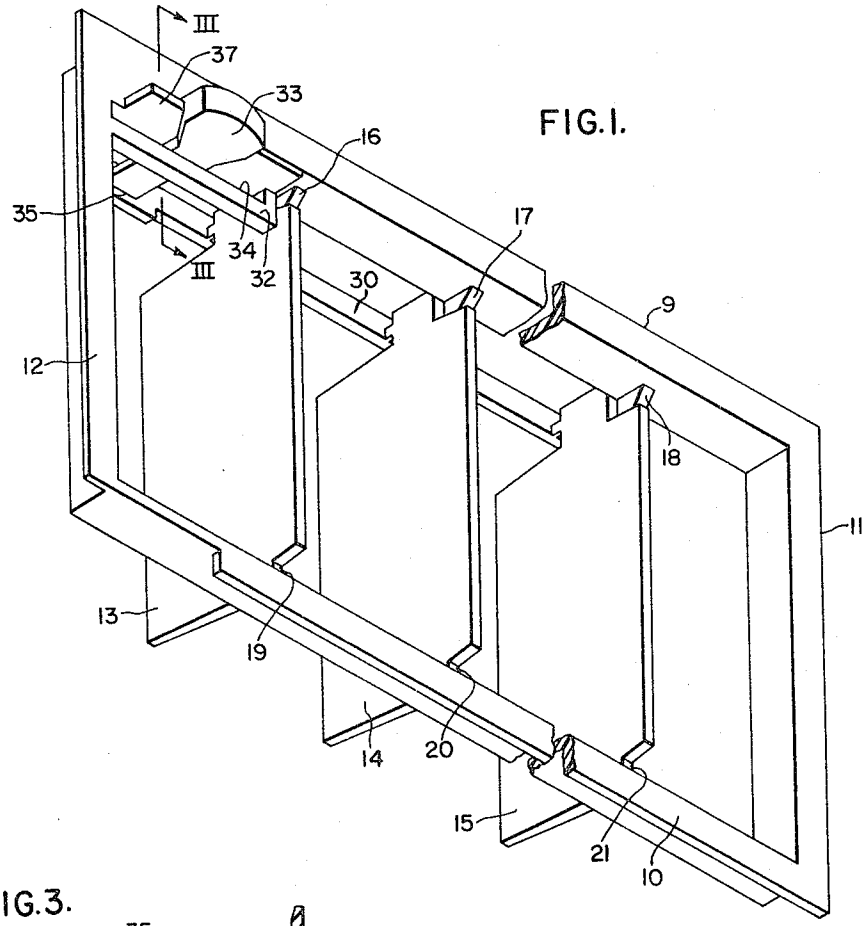
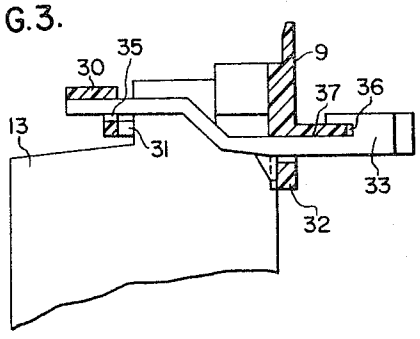



FIG.1.

FIG.3.



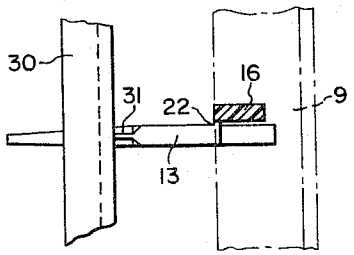




FIG.4.

WITNESSES

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FIG. 2.

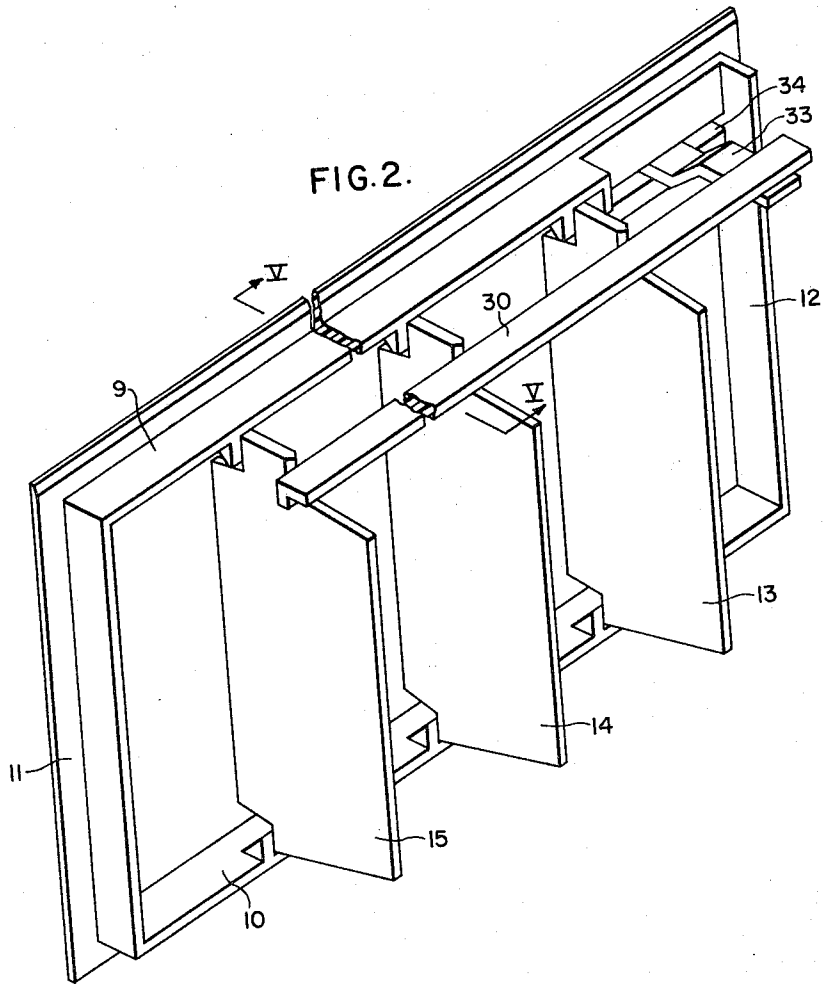



FIG. 6.

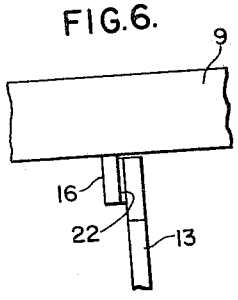
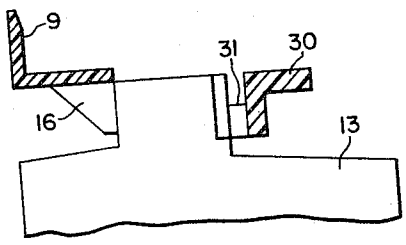



FIG. 5.



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# HINGED POLYPROPYLENE LOUVER SET

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6 Claims. (Cl. 98—40)

The present invention relates to adjustable air distribution grills or louver sets such as may be used to control the flow of air from an air conditioning cabinet or the like.

Numerous arrangements of movable vanes assembled in a frame as sets of controllable vanes for controlling air flow through an aperture have been devised in the past. Where a plurality of movable vanes are assembled in a set and supported on a common framework, the prior art arrangements have required the relatively costly procedure of assembling numerous individual parts in the mechanism together with the necessary interconnecting control linkages.

It is a principal object of the present invention to provide an improved low cost arrangement of a set of movable vanes in a single supporting framework that may be simultaneously formed and assembled with interconnecting control linkage by a single molding operation.

In accordance with the invention, the supporting framework, the plurality of movable vane members, and the interconnecting control link which is usually referred to as a gang bar are simultaneously formed and molded as a single piece of plastic material such as polypropylene. Each of the movable vanes is connected to respective portions of the supporting framework by integrally molded flexible hinge or web portions to thus enable the respective vane to be movable on the frame. Also the integrally molded gang bar is connected to a side edge portion of each vane by a flexible hinge or web portion in a plane parallel to but behind a side member of the frame so that a reciprocating movement of the gang bar will cause a simultaneous or ganged pivotal movement of the interconnected vanes.

Various other features and the attendant advantages of the invention will be apparent with reference to the following specification and drawings, in which:

FIGURE 1 is a perspective elevational view of the adjustable louver vane set of the invention as seen from the front;

FIG. 2 is a perspective elevational view of the adjustable louver vane set of the invention as seen from the rear;

FIG. 3 is a cross section on the line III—III of FIG. 2;

FIG. 4 is a fragmentary end view of one of the vanes showing the web or hinge connections to the gang bar and the frame with the frame broken away;

FIG. 5 is a section on the line V—V of FIG. 2; and

FIG. 6 is a fragmentary plan view of the top of the frame showing the flexible web connection of a vane to the inward projection of the frame.

Referring now to FIGS. 1 and 2 of the drawings, the louver vane set of the invention is comprised of a molded frame including side members or rails **9**, **10** and end cross members **11**, **12**. The frame is molded in one piece of suitable plastic material which may preferably be polypropylene. Polypropylene is a presently preferred material due to its extreme toughness and durability under flexing conditions as will be better understood from the following description of the details of the invention although it will be understood that other suitable plastic materials having the requisite toughness and flexibility may be used. In order to simplify the drawings, the louver set of the invention is shown to comprise



only three vanes **13–15** extending transversely between the side rails **9**, **10** of the frame and it should be understood that any number of vanes may be provided as desired.

Each of the side rails **9**, **10** is provided with a plurality of longitudinally spaced and oppositely positioned inwardly extending projections or ears **16**, **17**, **18** and **19**, **20**, **21**, respectively, which are integrally molded with the respective frame side rails **9** and **10**. As more clearly shown by FIGS. 4, 5 and 6 of the drawings, each of the vanes such as vane **13** is connected or joined to a respective projection such as the projection **16** by a thin flexible web portion such as shown at **22** which thus provides a hinge arrangement permitting the respective vanes to be moved about an axis parallel to the end cross members **11**, **12** and transverse to the axis of the side rails **9**, **10**. Each of the hinge web portions such as shown at **22** are integrally molded with the projections and the respective vanes such as the vane **13** and the previously mentioned preference for a tough and flexible plastic molding material such as polypropylene should now be well understood.

A gang bar such as shown at **30** is also integrally molded and connected to respective end surfaces of the vanes **13**, **14** and **15** by flexible web or hinge portions such as shown at **31** for the vane **13**. Since the gang bar is positioned in a plane behind the plane of the side member **9** and is interconnected to each of the vanes **13**, **14**, **15** by means of flexible hinge web portions such as shown at **31**, it will be understood that a reciprocating movement of the gang bar **30** will cause a pivotal simultaneous or ganged movement of each vane about its pivotal points of connection to the frame side rails **9** and **10**.

Now considering the above description of the invention, it will be seen that a one piece structure in which the frame members **9–12**, the vanes **13–15**, the projections **16–21**, and the hinge webs such as the webs **22** and **31** are all integrally molded in one piece of flexible polypropylene material by a single manufacturing step.

In order to provide a manual operator for reciprocating the gang bar **30**, a journal slide rail **32** may be integrally molded in one corner of the frame although the invention is not limited to the positioning of the journal slide rail **32** at the corner of the frame. An operating lever **33**, see FIGS. 1, 2 and 3 of the drawings, is received in the slot **34** between the journal slide rail **32** and the side rail **9** and its lower end is received in a slot **35** formed at the end of this gang bar **30**. As the lever **33** is slidably moved in the slot **34**, the gang bar **30** will be reciprocated to pivot the vanes **13–15** accordingly. The operating lever is provided with a slot **36** in which is received the upwardly extending flange **37** that is integrally molded with the side frame **9** so that a pivoting movement of the operating lever **33** is prevented as it is slidably moved within the slot **34**.

Various modifications will occur to those skilled in the art. For example, a different form of the operating lever **33** may be provided and it may be connected to the gang bar **30** at any point along its length.

I claim as my invention:

**1.** An adjustable louver vane set formed as a one-piece structure molded from plastic material comprising, a frame including generally parallel spaced apart side members and oppositely disposed end cross members, each of said side members having a plurality of spaced integrally molded oppositely positioned inwardly extending projections, a plurality of vane members integrally molded between said side members and connected by respective flexible plastic web portions to respective ones of said oppositely positioned projections, a gang bar integrally molded to interconnect respective end surfaces of said

vanes in a plane behind the plane of the said connecting web portions of said vanes to the projections of said side members, said gang bar being connected to the respective ones of said vanes by integrally molded flexible plastic web portions, said frame including integrally molded support means to receive movable operator means adapted to extend rearwardly from said support means to connect with said gang bar for effecting pivoting of said vanes.

2. An adjustable louver vane set according to claim 1 wherein said plastic material is comprised of polypropylene.

3. An adjustable louver vane set molded from plastic material comprising, a frame including generally parallel spaced apart side members and oppositely disposed end cross members, each of said side members having a plurality of spaced integrally molded oppositely positioned inwardly extending projections, a plurality of vane members integrally molded between said side members and connected by respective flexible web portions to respective ones of said oppositely positioned projections, a gang bar integrally molded to interconnect respective end surfaces of said vanes in a plane behind the plane of the said connecting web portions of said vanes to the projections of said side members, said gang bar being connected to the respective ones of said vanes by integrally molded flexible web portions, said frame including integrally molded support means to receive movable control means, control means carried by said support means and so connected to said gang bar that movement of said control means causes a reciprocating movement of said gang bar and a ganged pivotal movement of said vanes.

4. The invention of claim 3 wherein said plastic material is comprised of polypropylene.



5. An adjustable louver vane set molded from plastic material comprising, a frame including generally parallel spaced apart side members and oppositely disposed end cross members, each of said side members having a plurality of spaced integrally molded oppositely positioned inwardly extending projections, a plurality of vane members integrally molded between said side members and connected by respective flexible web portions to respective ones of said oppositely positioned projections, a gang bar integrally molded to interconnect respective end surfaces of said vanes in a plane beneath the plane of the said connecting web portions of said vanes to the projections of said side members, said gang bar being connected to the respective ones of said vanes by integrally molded flexible web portions, said frame including integrally molded support means located in a corner of said frame to receive movable control means, and control means slidably journaled on said corner support means of said frame and connected to an end of said gang bar whereby slidable movement of said control means causes a reciprocating movement of said gang bar and a ganged pivotal movement of said vanes.

6. The invention of claim 5 wherein said plastic material is comprised of polypropylene.

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