

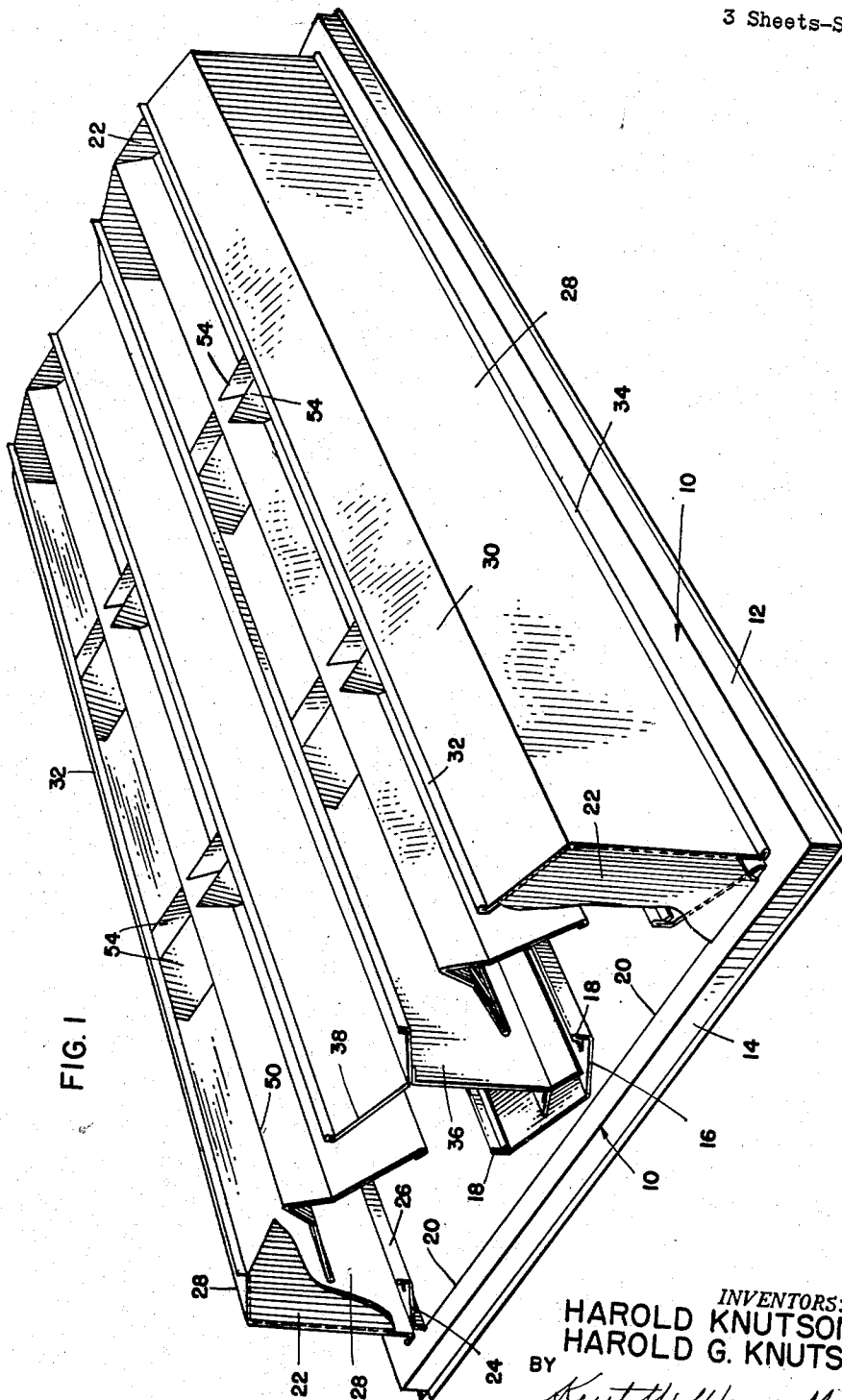
Aug. 31, 1954

H. KNUTSON ET AL
VENTILATOR

2,687,685

Filed Oct. 12, 1950

3 Sheets-Sheet 1



HAROLD KNUTSON
HAROLD G. KNUTSON

BY

Kent M. Wonnell

ATT'Y

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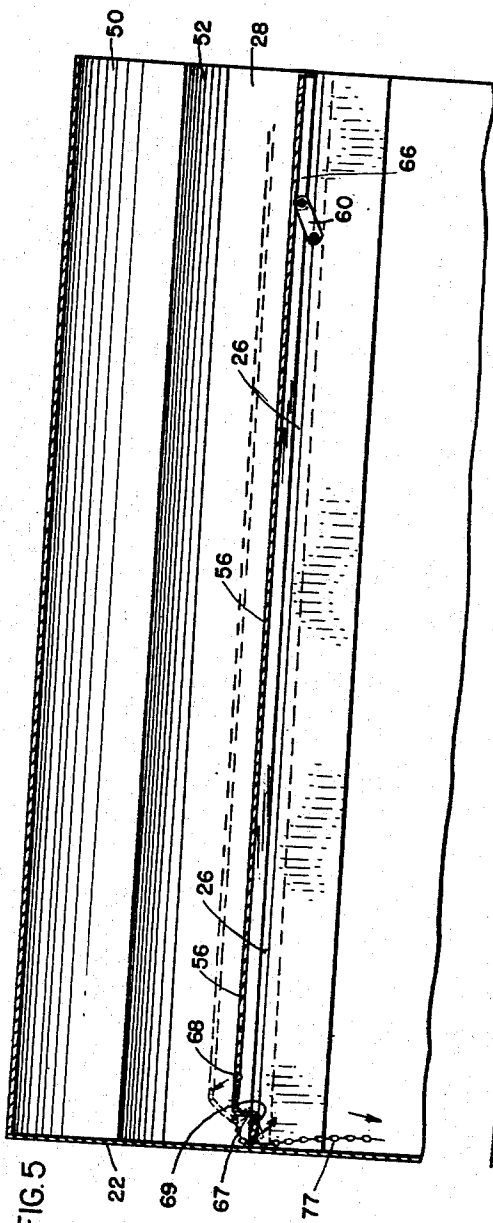


FIG. 5

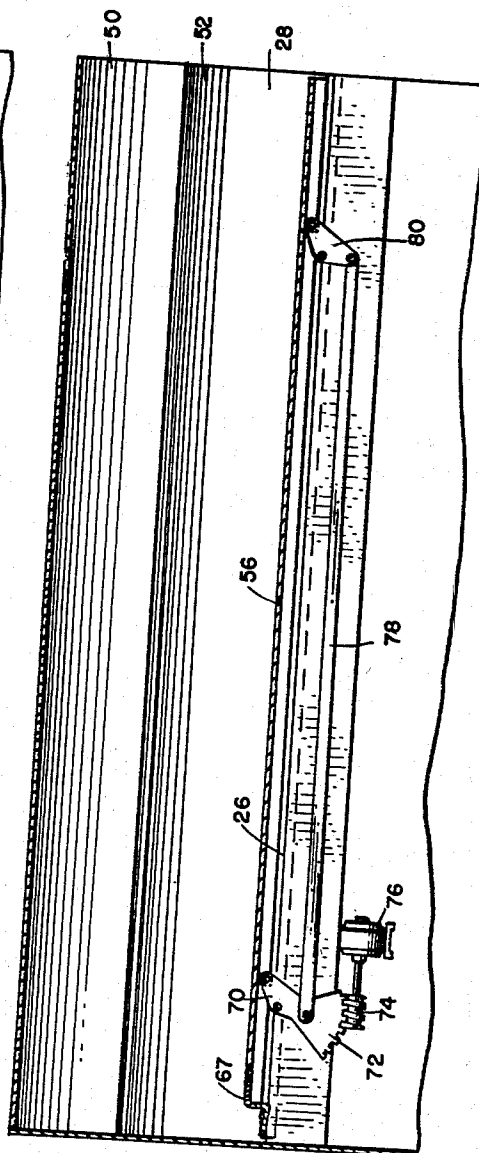


FIG. 6

INVENTORS:
HAROLD KNUTSON
HAROLD G. KNUTSON

BY

Keut W. Wonnell

ATT'Y

UNITED STATES PATENT OFFICE

2,687,685

VENTILATOR

Harold Knutson and Harold G. Knutson,
Chicago, Ill.

Application October 12, 1950, Serial No. 189,822

6 Claims. (Cl. 98-42)

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This invention relates in general to ventilators and is more particularly described as a dual ridge ventilator having parallel outlets and adapted to fit over a curb and in connection with each other to provide for substantially continuous ventilation.

In ventilators of the dual ridge type, it is important to connect them together so that they will have a connected common wall and to strengthen the opposite walls of each ventilator by pairs of deflectors intermediate the ends which will tend to divert the wind blowing over the tops of the ventilators and to prevent it from entering the ventilators from the top thereof and deflecting the normal outlet flow through the ventilators.

It is also important to mount the ventilators upon a deck which is adapted to fit around or over a curb and to provide adjacent interengaging portions for connecting dual units in succession upon a continuous top roof opening.

An important object of the invention is to provide a dual ridge ventilator unit having a supporting base and adapted to be interengaged with other similar units to form a substantially continuous ridge ventilator.

A further object of the invention is to provide a ventilator having improved means for preventing down draft and for deflecting the draft upwardly and outwardly therefrom, and to provide a maximum outlet area for a minimum height.

A still further object of the invention is to provide new and improved means for mounting, counter-balancing and operating the dampers in the ventilators.

Other objects of the invention will appear in the specification and will be apparent from the accompanying drawings in which,

Fig. 1 is a perspective view of a ventilator unit in accordance with this invention with part of one end omitted for showing the inner construction more clearly.

Fig. 2 is a sectional view of a ventilator structure as shown in Fig. 1 with a base adapted to interlock with similar bases at the sides thereof.

Fig. 3 is an elevational view showing the deflectors and braces and also showing the end to end connection of adjacent dual deflector units.

Fig. 4 is a sectional view of a single ridge type ventilator showing a damper in closed position therein.

Fig. 5 is a partial longitudinal section as taken on the line 5-5 of Fig. 4 showing a weighted

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means for operating and counter-balancing the damper; and

Fig. 6 is a view similar to Fig. 5 showing a motor operating means for the damper.

In applying dual ridge ventilators to a building, it is customary to provide a roof opening of desirable length with a curb or projection around the opening and to mount the ventilator in connection with the curb and overlapping it.

The ventilators are made in units of predetermined length and the present unit is provided with an interengaging and interlocking edge construction by means of which the units may be connected to each other either laterally or in end to end relation to completely cover the roof opening. For large installations of this kind usually installed upon a substantially flat deck, additional means is desirable to deflect a wind or gases sweeping over the ventilators and to prevent such gases tending to flow downwardly through the normal ventilator outlet. This is accomplished by inclining the upper sides adjacent the top outlet and by providing inner inclined diverters intermediate the ends of the ventilators which divert outside air and gases from entering the ventilators without obstructing the necessary escape of air and gases through the ventilator.

Referring now more particularly to the drawings, a mounting base 10 of sheet metal is shown in Fig. 1 having downwardly turned sides 12 and ends 14 which are so disposed when a single unit is used. These downwardly turned sides and ends are adapted to fit over a curb or some other roof support within which is the opening for the ventilator and these sides and ends are conveniently and solidly attached to the curb or other roof structure.

If the unit is to be connected to similar parallel units, one side 12a is turned upwardly as shown in Fig. 2, and the other side 12b is turned upwardly and downwardly to overlap and engage a similar side 12a of an adjacent unit. If the units are connected in end to end relation as shown in Fig. 3, one end 14a is turned upwardly and the other end 14b is turned upwardly and bent downwardly to overlap an end 14a of an adjacent unit.

With this construction, the units may be extended either laterally or end to end and solidly interconnected with a space between adjacent units to form a passageway through which a person may walk, if desired.

In constructing the ventilator, adjacent single units as shown in Fig. 4 are similarly formed into a

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twin unit and preferably have a common central member 16 inclined upwardly at both sides and the upper edges 18 turned upwardly and bent over downwardly to provide an inner seat for a damper. At the inside of the base 10 is an opening 20, and the central member 16 may be made from the material of the opening or formed separately therefrom and secured to the ends 22 in any well known manner.

At each outer side of the opening is a deflector 24 which extends angularly upward and has a vertical edge 26 which is turned downwardly and outwardly opposite the edge 18 of the central member 16 to provide the other opposite seat for a damper adapted to rest thereon. An outer side member 28 is connected between the end 22 at each side of the unit and has an upper inwardly inclined top 30, the inner edge of the top having an outward bead 32 and the lower edge of the side having an inward bead 34 for strengthening purposes. The lower edge of the bead 34 is terminated at a distance above the base 10 to form a draining outlet from the interior of the ventilator.

At the inside of each pair of ventilators is a common wall member 35 conforming to the vertical portion of the outer wall members 28 with an inwardly inclined trough 38 at the top and also an inverted trough 40 at the bottom. The upper edges of the top trough member 38 are turned over inwardly to form an outward protecting and strengthening bead 32 similar to those of the outer members 28. The inverted trough member 40 at the bottom is located within the common central member 16 and terminates short of engagement therewith to provide drain openings 42 between it and the member 16. This inner member comprising the common wall 36 and the trough portions 38 and 40 are secured together and to the ends 22 by flanges in a well known manner.

Extending transversely of each unit and at intervals therein are strengthening webs 44 connected to the upper side of the lower inclined members 24 and to the upright inner side of the outer side member 28. Between the inner members 36 and the central member 16 are similar strengthening webs 46 which are attached to the upper projecting sides of the central member 16, to the upper surfaces of the inverted trough 40, and to the opposite sides of the common wall 36.

A central angular deflector 50 is attached to the ends of each ventilator and extends longitudinally thereof with its apex slightly above the upper edges of the sides and with lower flaring sides 52 which are substantially parallel with the inclined portions 30 and 38 of the outer and inner sides respectively and also with the inclined lower deflectors 16 and 24 at the inner and outer sides respectively of each ventilator. The outer edges of the sides 52 project outwardly beyond the inner upright seat portions 18 and 26 of the bottom deflectors so that liquid dripping from the outer edges of the deflector 50 will fall upon the upper surface of the central deflector 16 and of the outward deflector 24 and liquid therefrom will drain outwardly through the central member and at the bottom of the inclined deflector 24 to one end outside of the base 10.

This deflector 50 is secured to the ends 22 of the ventilator and each end covers the apex of the deflector; intermediate its ends are down draft diverters 54 arranged in pairs and the members of each pair inclined toward each other as shown in Figs. 1 and 3. Any air passing over the top of

the ventilators and having a tendency to pass downwardly into the ventilator will be deflected upwardly by the inclined sides of these diverters to prevent any substantial flow of air or gas inwardly through the ventilator. These diverters are secured to the outer walls of the deflector 50 and to the inner walls of the inner and outer sides 36 and 28 principally at their inclined portions 38 and 30 respectively, thereby materially strengthening the sides and the inclined portion thereof and firmly holding the deflector 50 in place.

A damper 56 is also formed of sheet material and preferably has a central portion inclined downwardly at the sides with side flanges 58 bent downwardly at the edges to overlap the seat edges 18 and 26 of the corresponding bottom deflectors. This damper commonly rests in position on top of the vertical sides which form the damper seats and is movably mounted thereon by links 60 near one end, each mounted at its lower end upon a bearing pin 62 supported by the vertical side 26 (or 18) which forms the damper seat, and connected by a bearing pin 64 at its upper end engaging in a bracket 66 secured to the under side of the damper.

At the other end of the damper is a supporting member 67 somewhat S-shaped in section but of the same width as the damper and connected by a transverse pivot 68 to the end of the damper 56. Near the other end is a pivot 69 connected to the vertical edges 26 and 18 for supporting the member to swing from a full line position in which the upper edge is parallel with the damper to an upper open position of the damper as shown in broken outline in Fig. 5. One object of this construction is to insure that the damper and the member 67 will substantially fill a ventilator of predetermined length and still the damper may be swung upwardly to open to its full extent for the passage of air therethrough.

A pull cord or chain 77 is connected to the upper side of the damper near the end thereof and extends downwardly over the pivoting member 67 and may be pulled downwardly to raise the damper from its seat.

Instead of operating the damper with the chain 77, the lower end of a lever 70 connected to the vertical side 26 (or 18) may be formed with a rack 72 engaged by a pinion 74 which is operated in opposite directions by a motor 76. This lever 70 is connected by a bar 78 with another lever 80 near the other end of the damper which is rocked back and forth with the lever 70 and operates to swing the damper upwardly similar to the action of the link 60. An end member 67 similar to that shown in Fig. 5 may also be similarly connected at the other end of the damper. With this damper mounting, the operation of the motor in opposite directions will raise and lower the damper in a well known manner.

With this construction, a dual ventilator unit is formed which is strong and simple in construction provided with ample means for draining the unit and keeping it free from water or other liquids which tend to deteriorate the metal. The unit is connected for great end to end strength adapting it to be used as either in lateral or longitudinal alignment. The diverters within the ventilator and deflect any transverse air or gases upwardly and outwardly of the unit.

While a preferred construction has been described in some detail, it should be regarded by way of example and illustration rather than as a

limitation or restriction of the invention as various changes in the construction, combination and arrangement of the parts may be made without departing from the spirit and scope of the invention.

We claim:

1. A dual ventilator unit, comprising a common base and parallel ventilators mounted thereon and about an opening therethrough, each unit having a common horizontal central member for adjacent ventilators inclined upwardly at both side edges and the upper edges of the sides turned upwardly and then bent over downwardly to provide an inner seat for a damper, a common vertical wall extending upwardly from said central member the outer side of each ventilator opening having an inside deflector which extends angularly upward with a vertical edge which is turned downwardly and outwardly opposite the corresponding bent edge of the common member and spaced therefrom, a damper adapted to span the opening between the seat of the edge of the common central member and the edge of the outer deflector, outer side members for each ventilator terminating short of the lower edges of the bottoms of the upwardly inclined deflector members, the upper extremities of the side members inclined inwardly toward each other but spaced apart, and a central angular deflector for each ventilator located above the damper and having outwardly flaring edges extending beyond the edges of the lower inclined members which form the seat for the damper and oppositely inclined diverters secured between the angular deflector and the inclined outer walls of the ventilator, these diverters being spaced apart at their tops in pairs intermediate the ends of the angular deflector and extending outwardly from each other toward the bottom and tending to deflect inward air and gas currents outwardly from the ventilator.

2. In a ventilator having spaced sides inclined inwardly and spaced apart at the top, an angular deflector located between the spaced upper edges of the sides, the deflector having outwardly flaring sides which extend below and outwardly of the spaced upper edges of the sides and diverters arranged in pairs transversely of the deflector and the spaced sides, the upper edges of the diverters being substantially at the top of the spaced sides and the top of the angular deflector and extending downwardly to the lower edge of the deflector, the diverters being inclined toward each other and spaced apart at the top tending to prevent a current of air passing over the ventilator from flowing downwardly therein.

3. In a dual ventilator unit, a common horizontal central member for adjacent ventilators at the bottom inclined upwardly at its opposite sides, each side forming the inner edge of a damper seat, a corresponding outer bottom member for each ventilator inclined upwardly and the inner edge spaced from the inner edge of the common member and forming an outer damper seat, an outer side wall member for each ventilator terminating at a distance above the outer bottom inclined member to form a fluid discharge for rain, and the upper edge of each outer wall member being inclined inwardly, a common inner wall member for each ventilator having one portion inclined inwardly at the top toward the inwardly inclined top of the outer wall of each ventilator but spaced therefrom, the lower edge of the inner wall member having opposite portions also inclined outwardly but terminating

short of the upper inclined edge of the common central bottom member to allow liquid to pass downwardly to the center of the common member, the inner wall of adjacent ventilators being in common and disposed centrally of the common bottom member, a central angular deflector with its apex located at the top of each ventilator slightly above the upper edges of the inner and outer wall members, the lower edges of the deflector being inclined downwardly and flaring outwardly above but outwardly beyond the upper edges of the common central member and outer bottom members to provide a vertical space therebetween, a damper to engage the spaced edges of the inner and outer bottom members, means for supporting the damper in each ventilator below the deflector means to move the damper upwardly and downwardly below the deflector, and diverters mounted at both sides of the angular deflector in pairs intermediate the ends thereof, the diverters being spaced apart at their tops and inclined outwardly at their bottoms and connected at their outer ends to the adjacent portions of the side walls.

4. In a dual ventilator unit comprising adjacent individual ventilators, a horizontal common central member for both ventilators inclined upwardly at its opposite edges to form a damper seat, the central member forming a trough for diverting liquid endwise with respect to adjacent ventilators, a vertical wall above the common central member for each adjacent ventilator, the lower edge of said vertical wall having an inverted trough portion inclined outwardly within the common member and terminating at a distance from the adjacent inclined portion of the common member to allow liquid to flow downwardly to the central trough of the common member, the upper edge of the vertical wall member having an upright angular trough portion inclined inwardly substantially parallel to the inclination of the corresponding trough portion of the common central member, an outer wall for each ventilator having a vertical portion, a bottom inclined member extending inwardly and upwardly from the lower end of each outer wall, the upper edge of the inclined member forming an outer damper seat, the upper edge of the outer wall member inclined inwardly substantially parallel with its bottom wall inclined member and the bottom of the outer vertical wall member being spaced from its bottom inclined wall member to discharge liquid therebetween, a central angular deflector for each ventilator having an apex spaced from the upper edges of the inner and outer wall members and outwardly flaring sides projecting beyond the inner and outer damper seats but spaced above the damper seat, a damper mounted in the ventilator having supports below the deflector and movable from the damper seats to an upper position below the flaring edges of the deflector, and diverter means mounted between the angular deflector and the adjacent inner and outer side walls of each deflector, the diverters being arranged in pairs spaced apart at their tops and inclined outwardly at their bottoms tending to divert a blast of air or gas passing over the ventilator outwardly therefrom.

5. In a ventilator having opposite side walls inclined inwardly but spaced apart at the top, inclined members at the bottom extending inwardly substantially parallel with the inclined portions of the side walls and having upper edges turned downwardly to form opposite spaced

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damper seats, a damper movably mounted in the ventilator to engage and rise from the seats, an angular ridge deflector with its apex between the spaces and inclined portions of the top and extending above the level of the tops of the sides, the sides of the angular deflector extending downwardly and outwardly spaced from but overlying the damper seats, web means connecting the said inclined members at the bottom and the side walls to provide a fluid escaping space between the said inclined members and the side walls, other web means connecting the angular deflector and adjacent portions of the side walls, all of these last web means extending oppositely in pairs intermediate the ends of the deflector, the members of each pair being spaced apart at the top and inclined outwardly at the bottoms to form diverters tending to prevent air and gas which passes over the deflector from passing downwardly therethrough.

6. A dual ventilator unit, comprising a common base and parallel ventilators mounted thereon and over an opening therethrough, each unit having a horizontal common central member for adjacent ventilators inclined upwardly at both sides to provide a discharge trough and the upper edges of the sides forming inner damper seats, a vertical common central wall member for adjacent ventilators extending upwardly over the horizontal common central member and having an angular trough secured to the upper edge thereof and inclined outwardly and an inverted trough member at the bottom of the vertical common wall member which is positioned within the horizontal common central member and the outer edges thereof terminating short of the

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upper edges of the common central member to provide continuous drain spaces therebetween, the outer side of each ventilator opening having a deflector which extends angularly upwardly and inwardly to correspond with the edges of the common central member and to provide a vertical edge forming an outer seat for a damper, an outer side wall member for each ventilator terminating short of the lower edge of the said deflector at its bottom member to provide a drain opening and the upper edge of the outer side wall member inclined inwardly to correspond with the upper edge of the upper trough of the vertical common wall member between the ventilators which is inclined outwardly, a deflector having an apex extending above the tops of the inwardly inclined edges of the outer wall members and having flaring sides extending outwardly and spaced above but overlapping the inner and outer damper seats of each ventilator, and a damper having supports in the inner and outer damper seats and movable from a position on the seats to a position under the flaring sides of the deflector in each ventilator.

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