MAGNETIC INSECT SCREEN


Filed Feb. 9, 1971, Ser. No. 113,951
Int. Cl. E04b 2/00; A47b 23/00

U.S. Cl. 156—71

6 Claims

ABSTRACT OF THE DISCLOSURE

A method for removably mounting an insect screen over a vehicle window opening with a pair of flexible magnetic strips which are self-aligning and between which the edges of the insect screen are sandwiched around the vehicle window opening.

FIELD OF THE INVENTION

The present invention relates to a method for removably mounting an insect screen over a vehicle window opening.

BACKGROUND OF THE INVENTION

In general, vehicles are provided with glass windows which open to provide ventilation and which also permit insects to enter the vehicle to the discomfort of the occupants. This has been a particularly serious problem when the vehicle remains stationary for a long period of time and ventilation is necessary such as, for example, when the vehicle is used as sleeping accommodations on a camping trip. To alleviate this problem insect screens have been placed over window openings and held in place by a plurality of small rigid magnets spaced around the window opening. To obtain a permanent assembly, as many as forty small magnets have been temporarily held in place on a piece of insect screen over a window opening by strips of adhesive tape, the screen with magnets in place has been removed from the vehicle and glued in place and the excess screen has been trimmed away. To obtain an aesthetically acceptable finished product it has then been necessary to apply a strip of opaque pressure-sensitive adhesive tape around the edge of the screen. However, in use insects may get into the vehicle under the screen between the spaced magnets.

SUMMARY OF THE INVENTION

The method of the present invention for removably mounting an insect screen over a vehicle window opening overcomes the aforementioned disadvantages of the prior art. A pair of thin flat magnetic strips is provided, each strip having a north pole and a south pole at one broad face extending longitudinally the length of the strips. Each strip is capable of being bent through a radius of curvature of less than two inches while its broad faces remain planar and a pressure-sensitive adhesive layer covers one of its broad faces. The first magnetic strip is placed adhesive side out against the vehicle window frame around the window opening and a piece of the insect screen having dimensions greater than the window opening is contacted against the exposed adhesive layer. The second magnetic strip is then positioned with its adhesive covered face adjacent the first strip and with its magnetic poles aligned with the opposite poles of the first strip, and it is permitted to contact the screen in alignment with the first strip around the window opening. If desired, the excess insect screen may then be trimmed from around its magnetic framework to produce an aesthetically pleasing assembly. In this manner a continuous magnetic framework is provided around the insect screen, which framework prevents insects from entering a vehicle.

THE DRAWING

In the drawing:

FIGS. 1 through 5 illustrate successive steps in practicing the method of the present invention; and

FIG. 6 is a perspective view partially in section illustrating in detail the step also illustrated in FIG. 4 and showing a preferred form of adhesive-bearing magnetic strips.

According to the method of the present invention, an insect screen 10 is mounted over a window opening 11 in a vehicle, such as an automobile, a truck or a camper, having a paramagnetic frame 12 bordering the window opening 11.

A pair of thin flat magnetic strips 14 and 16 are provided, each strip having a north magnetic pole and a south magnetic pole at one broad face extending longitudinally the length of the strip and having a pressure-sensitive adhesive layer 20 on one broad face 18, each strip 14 and 16 being capable of being bent through a radius of curvature of less than two inches while its broad face 18 remains planar. Suitable magnetic strips comprising permanent magnetic particles in a flexible non-magnetic matrix are described in U.S. Letters Pat. No. 2,999,275. They are magnetized in the directions indicated by the arrows 22 in FIG. 6 to provide a north magnetic pole and a south magnetic pole at the broad face 18 of each magnetic strip. While one north pole and one south pole are sufficient, the magnetic strips may be magnetized to have additional magnetic poles at their broad faces 18 so long as the edges of the strips tend to align when the adhesive layers of two strips are placed together. In a preferred embodiment the magnetic strips are 0.06 inch thick and 0.25 inch wide, the adhesive layer 20 has a thickness of 0.005 inch, and the insect screen 10 is a woven nylon tent type screen.

A release liner 24 covers each pressure-sensitive adhesive layer 20. The release liner is made of a material, for example, silicone treated paper, which will adhere to and may be easily removed from the pressure-sensitive adhesive layer 20 without affecting the adhesive characteristics of the adhesive. The magnetic strips 14 and 16 are preferably identical and similarly provided in roll form either as a single continuous roll or as two separate rolls coiled in the same direction with the release liner 24 facing outward, each strip at least having a length sufficient to extend around the entire periphery of the window opening 11.

The first magnetic strip 14 is placed against the window frame 12 around the window opening 10 with its adhesive side outward by placing its free end against the window frame 12 and uncoiling it around the window frame as is illustrated in FIG. 1. When the first magnetic strip encompasses the entire window opening 11 any excess is preferably severed and its free end is aligned with the end first placed against the window frame to form a butt joint 28 as illustrated in FIG. 2.

The release liner 24 is then removed from the first magnetic strip 14 to expose its pressure-sensitive adhesive layer 20 (see FIG. 2). Next, a piece of the insect screen 10 having dimensions greater than the window opening is contacted against the exposed pressure-sensitive adhesive layer 20 on the first magnetic strip 14 around the window opening 11 as is illustrated in FIG. 3. The pressure-sensitive adhesive 20 on the first magnetic strip 14 retains the insect screen 10 in position over the window opening but can easily be peeled away to permit adjustment of the position of the screen if necessary.

The second magnetic strip 16 is then positioned with its adhesive covered face adjacent the first strip 14 and with
the magnetic poles at the one broad face 18 of the second strip aligned with the opposite magnetic poles at the one broad face 18 of the first strip. If, as aforesaid, the magnetic strips are identical and provided in similar rolls, the magnetic poles will be properly aligned by simultaneously uncoiling and positioning the second strip while progressing around the window frame 12 in the same direction as the first strip was uncoiled in placing it against the window frame (see FIGS. 1 and 4). While the second strip 16 is being uncoiled it is positioned adjacent the first strip 14, its release liner 24 is removed and its adhesive layer is permitted to contact the screen in alignment with the first strip. To facilitate the application of the second strip, these steps are performed sequentially over short segments of the second strip while progressing around the window opening. By reference to FIG. 6 it can be seen that the opposite poles on the broad faces of the magnetic strips are aligned and attractive upon positioning the second strip. Thus, the attraction between the opposite poles will cause the strips to center on each other and the edges of the strips to align when the second strip is permitted to contact the screen. As with the first strip 14 the ends of the second strip 16 are preferably aligned to form a butt joint 30. The butt joints 28 and 30 are preferably produced at different locations around the window frame 12 (compare FIGS. 2 and 5) to form a continuous magnetic framework around the insect screen 10. When formed in this manner the magnetic strips will tend to retain their shape when it is removed from the window frame 12 for convenience of handling. Pressure is then preferably applied to the exposed opposite broad face of the second magnetic strip 16 to cause the pressure-sensitive adhesive 20 on the magnetic strips 14 and 16 to flow into the mesh of the screen 10 to increase the bond between the magnetic strips and the screen. Finally, the excess screen is trimmed from around the magnetic frame as is illustrated in FIG. 5 to increase the aesthetic appearance of the assembly.

The magnetically framed insect screen may remain in position as long as this use is desired. Since the magnetic strips 14 and 16 and the insect screen 10 are continuous around the window opening 11 insects are effectively sealed out of the vehicle. When it is desired to store the magnetically framed insect screen it may be simply grasped and peeled away from the vehicle window frame 12 and, due to the flexibility of the magnetic strips 14 and 16, it may be rolled up and conveniently stored for reuse.

We claim:

1. A method for removable mounting an insect screen over a vehicle window opening having a paramagnetic frame, comprising the steps of:
   providing first and second thin flat magnetic strips each magnetized having at one broad face opposite poles extending longitudinally the length of the strip and having a pressure-sensitive adhesive layer on said one broad face, each strip being capable of being bent through a radius of curvature or less than two inches while said broad face remains planar;
   placing the first magnetic strip against the vehicle window frame around the window opening adhesive side outward;
   contacting a piece of insect screen having dimensions greater than the window opening against the exposed adhesive layer;
   positioning the adhesive covered face of the second magnetic strip adjacent the first strip with the poles of the second strip aligned with the opposite poles of the first strip; and
   permitting the second strip to contact the screen in alignment with the first strip around the window opening.

2. The method of claim 1 wherein each of said magnetic strips is provided with a release liner covering its pressure-sensitive adhesive layer, including the steps of removing the release liner from the first magnetic strip after the step of placing the first strip around the window opening and removing the release liner from the second magnetic strip prior to the step of permitting the second strip to contact the screen.

3. The method of claim 2 wherein said steps of positioning the second magnetic strip, removing the release liner from the second strip and permitting the second strip to contact the screen are performed sequentially over short segments of the second strip progressing around the window opening.

4. The method of claim 1 wherein said step of placing the first magnetic strip around the window opening includes butting the free ends of the first strip together and wherein said step of positioning the second magnetic strip includes butting the free ends of the second strip together at a position intermediate the ends of the first strip to form a continuous framework for the insect screen.

5. The method of claim 1 including the further step of trimming the excess insect screen beyond its magnetic strip framework.

6. The method of claim 1 including the further step of pressing against the second magnetic strip to cause the pressure-sensitive adhesive on the magnetic strips to flow into the mesh of the insect screen.

References Cited

UNITED STATES PATENTS
2,595,833 5/1952 Plaherty 160—354
2,717,036 9/1955 Harris 160—354
3,046,952 1/1962 Shero 160—354
3,175,603 3/1965 Tonnong 160—354

DOUGLAS J. DRUMMOND, Primary Examiner
U.S. Cl. X.R.
156—196, 267; 160—354, Dig. 2, Dig. 16
UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Inventor(s) Philip D. Hinderaker and Karl E. Nelson

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, claim 1, line 2, change "or" to -- of --.

Signed and sealed this 30th day of January 1973.

(SEAL)
Attest:
EDWARD M. FLETCHER, JR. ROBERT GOTTSCHALK
Attesting Officer Commissioner of Patents