TITLE

SLIDING MECHANISM

FIELD OF THE INVENTION

The present invention relates to a sliding mechanism suitable for use with, *inter alia*, an attachment for a visor, such as a vehicle sun-visor.

BACKGROUND TO THE INVENTION

It is known to use translucent panels, such as tinted panels, in conjunction with opaque sun-visors in vehicles. Correct placement of a tinted panel can enable a driver to clearly view a region in front of a vehicle, even in the presence of a high degree of glare.

Typically, such a translucent panel is coupled to a sun-visor by a hinge mechanism, allowing the panel to move between a concealed position and an exposed position. Alternatively, it is also known to use a translucent panel having a sliding mechanism, together with a retaining means to hold the panel in a concealed position when not in use.

A significant limitation of known panels and associated attachment mechanisms is an inability to easily move the panel through a range of positions whilst driving. It will be appreciated that the relative position of the sun to a driver is constantly changing whilst a vehicle is being driven. Mechanisms such as that described above, where the panel moves between a concealed and an exposed position, require that the panel be in its exposed position no matter where the sun is located relative to the vehicle. Such mechanisms do not generally permit vertical movement of the panel, to allow for

changes in the sun's altitude, or horizontal movement of the panel to allow for changes in the direction of travel of the vehicle.

The present invention attempts to provide a sliding mechanism which overcomes at least in part some of the aforementioned disadvantages of previous panel attachment mechanisms.

SUMMARY OF THE INVENTION

In accordance with one aspect of the present invention there is provided a sliding mechanism, wherein the sliding mechanism includes a base member, a first sliding member, and a second sliding member; the first sliding member being arranged to slide relative to the base member and the second sliding member being arranged to slide relative to the first sliding member.

Preferably, the second sliding member is arranged to slide in a direction substantially perpendicular to that of the first sliding member.

More preferably, the sliding mechanism is used in conjunction with a visor attachment.

In accordance with a second aspect of the present invention there is provided a visor attachment, the visor attachment including an adjustment means, wherein the adjustment means includes a base member and a first sliding member, the first sliding member being arranged to slide relative to the base member, the first sliding member being coupled to the base member by means of magnetic attraction.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a front view of a disassembled sliding mechanism in accordance with the present invention; and

Figure 2 is a rear view of the disassembled sliding mechanism of Figure 1.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to the Figures, there is shown a sliding mechanism 10 for a visor attachment. The sliding mechanism 10 has three members: a base member 12, a first sliding member 14 and a second sliding member 16. In the embodiment of the drawings the second sliding member may be the visor attachment. Alternatively, the visor attachment may be mounted to the second sliding member.

The base member 12 comprises a substantially rectangular first plate 18, arranged in a substantially vertical configuration, the first plate 18 having a front face 20 and a rear face 22. Two substantially rectangular first raised portions 24 are mounted to the front face 20. The first raised portions 24 are the same length as the first plate 18, and are mounted parallel to each other, and spaced apart from each other. The first raised portions 24 thus define a central strip 26 on the front face 20, the central strip 26 being between the raised portions 24, and two outer strips 27 located at the top and bottom respectively of the front face 20.

The first plate 18 is formed from a ferromagnetic material, such as galvanised iron. In a preferred embodiment of the invention the first raised portions 24 are formed from a

lightweight, non-magnet material such as plastic, which is mounted to the first plate 18 by suitable means such as an adhesive.

The base member 12 has an front outer surface comprising the central strip 26 and outer strips 27 of the first plate 18, side walls of the first raised portions 24 and front walls of the first raised portions 24. In a preferred embodiment the front outer surface is lined with a low friction material such as polytetrafluoroethylene.

The first sliding member 14 is similar in construction to the base member 12. It comprises a substantially rectangular second plate 28 having a front face 30 and a rear face 32, and has a substantially rectangular second raised portion 34 mounted on the front face 30. The substantially rectangular second raised portion 34 is arranged substantially vertically, and thus the first sliding member 14 has two substantially vertical strips 36 on the front face 30. The second plate is constructed of a ferromagnetic material.

As with the base member 12, a front outer surface of the first sliding member 14 is preferably lined with a low friction material such as polytetrafluoroethylene.

The first sliding member 14 also includes a first coupling means in the form of a plurality of permanent magnets 38 mounted to the rear face 32 of the second plate 28. In the embodiment of the drawings there are four permanent magnets 38 mounted to the rear face 32. The magnets 38 are arranged on either side of an imaginary horizontal channel, the imaginary channel being the same width as the combined width of the first raised portions 24 and central strip 26 of the base member 12. The magnets 38 are similar in height to, although slightly higher than, the first raised portions 24.

Preferably, the magnets 38 are rare earth magnets.

The magnets 38 are mounted to the rear face 32 by suitable means such as adhesive. Each magnet 38 has an outer end 40 remote from the rear face 32. Preferably, each outer end 40 is lined with a low friction material such as polytetrafluoroethylene.

The first sliding member 14 also includes an adjustment means. The adjustment means comprises a horizontally aligned member 35 which extends along the rear face 32, and to either side of the first sliding member 14. The member 35 is substantially the same width as the central strip 26 on the front face 20 of the first plate 18 and locates, in use between the first raised portions 24. The member 35 thus constrains the motion of the first sliding member 14 in a horizontal direction relative to the first plate 18.

The horizontally aligned member 35 has a forwardly projecting manoeuvring portion 37 located at an outer end thereof.

The second sliding member 16 comprises a substantially rectangular third plate 42 having a front face 44 and a rear face 46. The third plate 42 is substantially horizontal. The second sliding member 16 includes a second coupling means in the form of a plurality of permanent magnets 48 mounted to the rear face 46 of the third plate 42. In the embodiment of the drawings there are four permanent magnets 48 mounted to the rear face 46. The magnets 48 are arranged on either side of an imaginary vertical channel, the imaginary channel being the same width as the second raised portion 34 of the first sliding member 14. The magnets 48 are similar in height to the second raised portion 34, being slightly higher.

Preferably, the magnets 48 are rare earth magnets.

The magnets 48 are mounted to the rear face 46 by suitable means such as adhesive. Each magnet 48 has an outer end 50 remote from the rear face 46. Preferably, each

outer end 50 is lined with a layer of a low friction material such as polytetrafluoroethylene.

The coupling means further includes two vertically aligned attachment portions 52. The attachment portions 52 are mounted to the rear face 46, and lie on either side of the imaginary channel.

The second sliding member includes a vertical slot 54 extending from a top end thereof. The vertical slot 54 is sized so as to receive the manoeuvring portion 37.

In use, the base member 12 is fixed to a vehicle sun-visor (not shown). The first sliding member 14 is coupled to the front face 20 of the base member 12, by placing the magnets 38 about the first raised portions 24, and the horizontally aligned member 35 along the central strip 26. It will be appreciated that the magnets 38 are attracted to the ferromagnetic nature of the outer strips 27, and that this magnetic attraction will be sufficient to maintain the first sliding member 14 relative to the base member 12 in a desired position. It will also be appreciated that the application of a small horizontal force to the first sliding member 14 via the manoeuvring portion 37 will be sufficient to permit the outer ends 40 of the magnets 38 to slide over the strips 27. The presence of the first raised portions 24 will constrain this sliding motion to sliding in a horizontal direction.

In a similar fashion, the second sliding 16 is coupled to the front face 30 of the first sliding member 14 by placing the magnets 48 and attachment portions 52 about the second raised portion 34. It will be appreciated that the magnets 38 are attracted to the ferromagnetic nature of the strips 36, and that this magnetic attraction will be sufficient to maintain the second sliding member 16 relative to the first sliding

member 14 in a desired position. It will also be appreciated that the application of a small vertical force to the second sliding member 16 will be sufficient to permit the outer ends 50 of the magnets 48 to slide over the strips 36. The presence of the second raised portion 34 will constrain this sliding motion to sliding in a vertical direction, that is a direction to substantially perpendicular to the sliding motion of the first sliding member 14.

A driver can thus readily move the visor attachment by the application of a small force to the visor attachment and thus the second sliding member 16. Any horizontal component of the applied force will be transmitted through the second raised portion 34 to the first sliding portion 14, and will cause the first sliding portion 14 (and thus the second sliding portion 16) to move in a horizontal direction relative to the base member 12 and thus the sun-visor. Any vertical component of the applied force will cause the second sliding portion 16 to move in a vertical direction relative to the first sliding portion 14, and thus the base member 12 and sun-visor.

It will be appreciated that the low-friction nature of the couplings will permit easy movement of each member relative to another. It will also be appreciated that the attractive forces are independent of position, and thus small adjustments of the visor attachment can be easily achieved.

In a preferred embodiment of the drawing, the third plate 42 is constructed of material having varied degrees of tinting. In the embodiment of the drawings the third plate 42 has a first region 56 which has an opaque lining, a second region 58 which has a medium degree of tinting and a third region 60 which is heavily tinted. It will be appreciated that the degree of tinting, and the arrangement of various regions, can be varied to suit particular applications.

Although the invention has been described with reference to a sun-visor, it will be appreciated that the sliding mechanism can be applied to many different applications. Modifications and variations as would be apparent to a skilled addressee are deemed to be within the scope of the present invention.

CLAIMS

1. A sliding mechanism, wherein the sliding mechanism includes a base member, a first sliding member, and a second sliding member; the first sliding member being arranged to slide relative to the base member and the second sliding member being arranged to slide relative to the first sliding member.
2. A sliding mechanism as claimed in claim 1, wherein the second sliding member is arranged to slide in a direction substantially perpendicular to that of the first sliding member.
3. A sliding mechanism as claimed in claim 1 or claim 2, wherein the first sliding member is arranged to slide in a substantially horizontal direction relative to the base member.
4. A sliding mechanism as claimed in any preceding claim, wherein the second sliding member is arranged to slide in a substantially vertical direction relative to the first sliding member.
5. A sliding mechanism as claimed in any preceding claim, wherein the base member includes at least one substantially rectangular first raised portion mounted on an outer side thereof, and the first sliding member includes a first coupling means, the coupling means being arranged, in use, to locate on either side of the first raised postion.
6. A sliding mechanism as claimed in claim 5, wherein the base member includes two first raised portions defining a central channel between, and the first sliding member includes an adjustment means arranged to be held in the central channel.

7. A sliding mechanism as claimed in any preceding claim, wherein the first sliding member includes a substantially rectangular second raised portion mounted on an outer side thereof, and the second sliding member includes a second coupling means, the coupling means being arranged, in use, to locate on either side of the second raised postion.

8. A sliding mechanism as claimed in claim 5 or claim 6, wherein the coupling means includes permanent magnets.

9. A sliding mechanism as claimed in claim 7, wherein the magnets are rare earth magnets.

10. A sliding mechanism as claimed in claim 7 or claim 8, wherein the base member includes a plate made of ferromagnetic material to which the magnets are attracted.

11. A sliding mechanism as claimed in any one of claims 7 to 9, wherein the first sliding member includes a plate made of ferromagnetic material to which the magnets are attracted.

12. A sliding mechanism as claimed in any preceding claim, wherein the sliding parts are lined with a layer of polytetrafluoroethylene.

13. A visor attachment having a sliding mechanism as claimed in any preceding claim.

14. A visor attachment as claimed in claim 13, wherein the visor attachment is the second sliding member.

15. A visor attachment as claimed in claim 13, wherein the visor attachment is mounted to the second sliding member.

16. A visor attachment, the visor attachment including an adjustment means, wherein the adjustment means includes a base member and a first sliding member, the first sliding member being arranged to slide relative to the base member, the first sliding member being coupled to the base member by means of magnetic attraction.