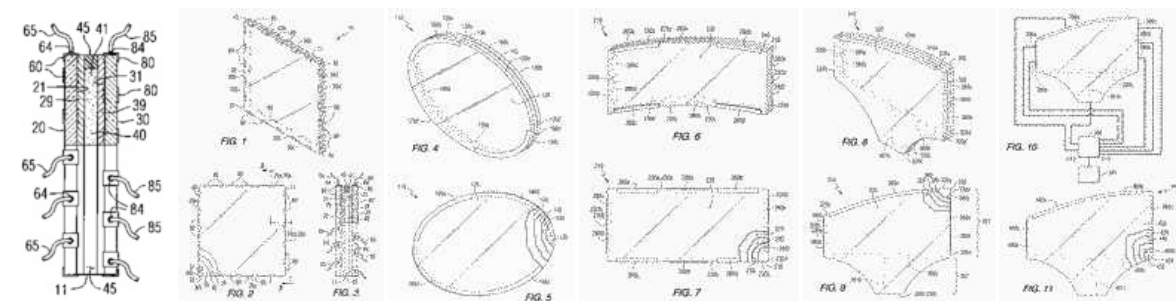
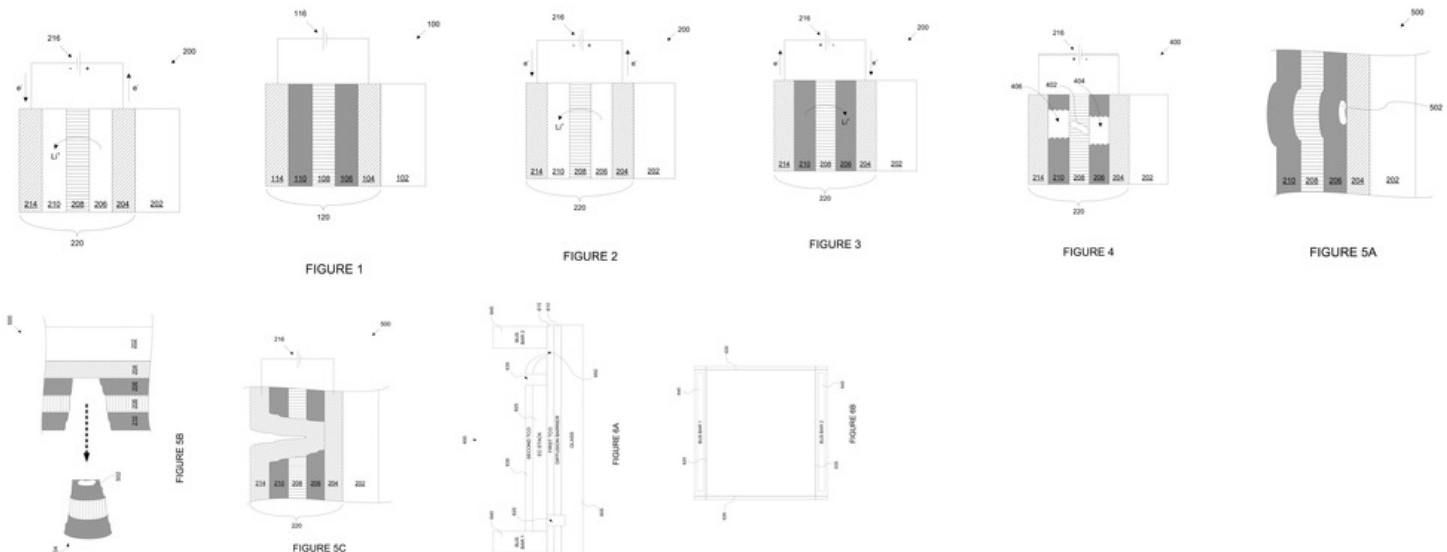
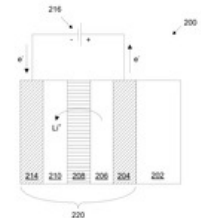
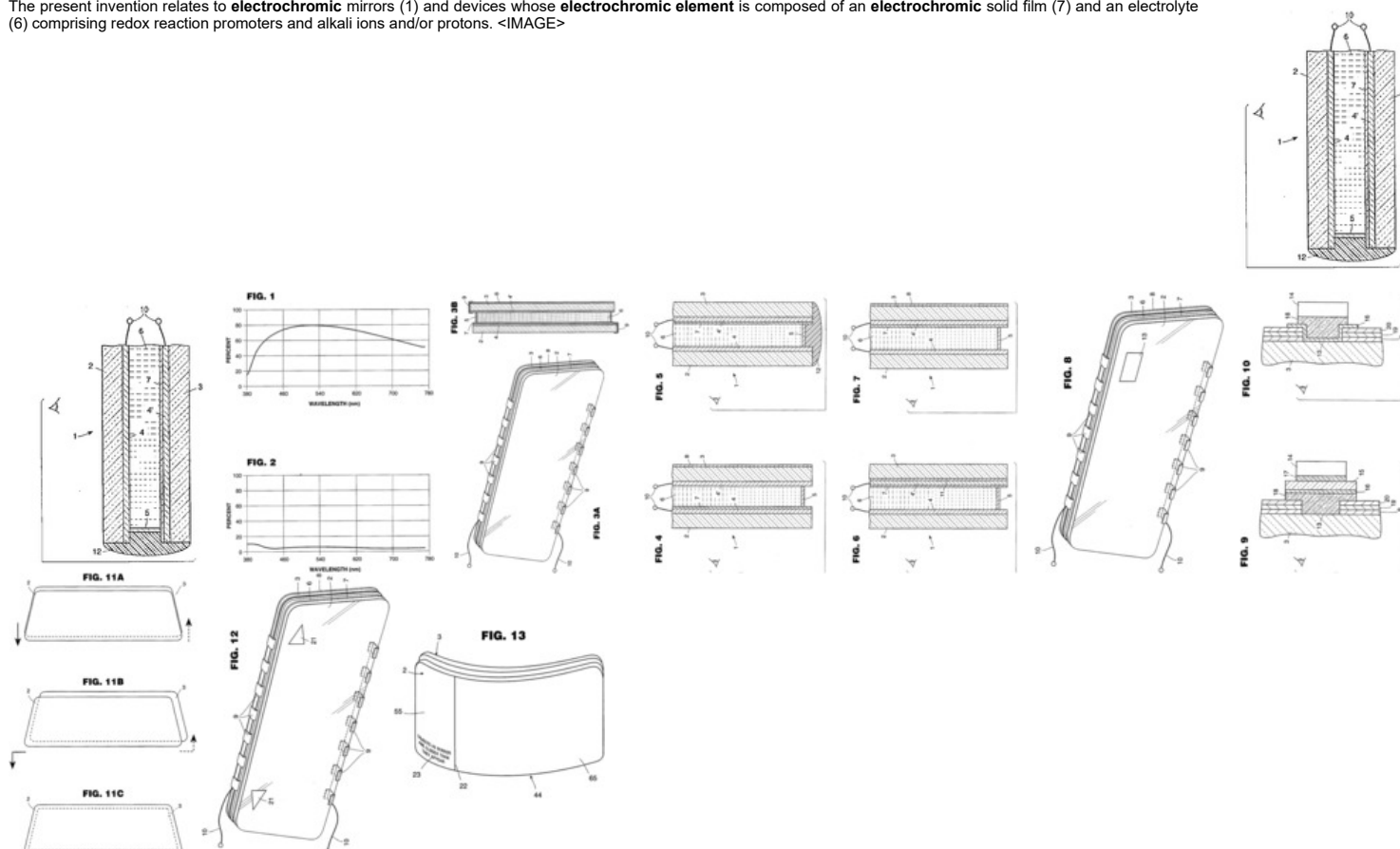
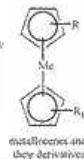
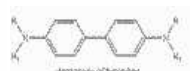
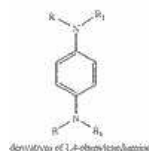
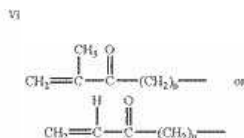
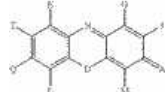
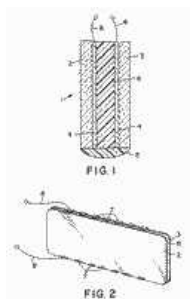
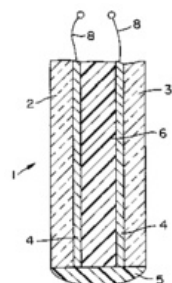
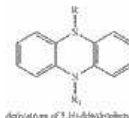
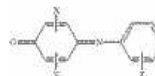
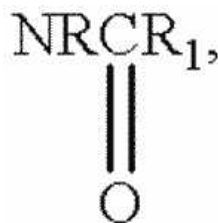


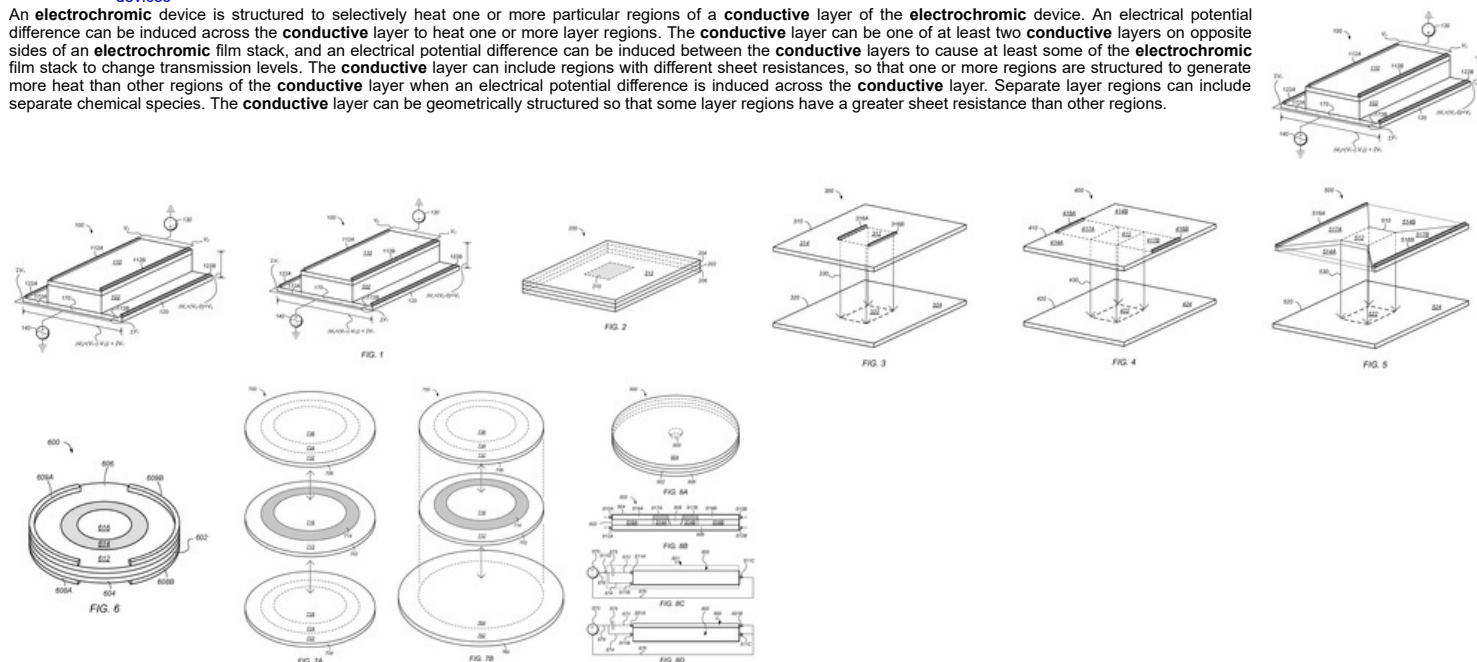


Prior **electrochromic** devices frequently suffer from poor reliability and poor performance. Some of the difficulties result from inappropriate design and construction of the devices. In order to improve device reliability two layers of an **electrochromic** device, the counter electrode layer and the **electrochromic** layer, can each be fabricated to include defined amounts of lithium. Further, the **electrochromic** device may be subjected to a multistep thermochemical conditioning operation to improve performance. Additionally, careful choice of the materials and morphology of some components of the **electrochromic** device provides improvements in performance and reliability. In some devices, all layers of the device are entirely solid and inorganic.

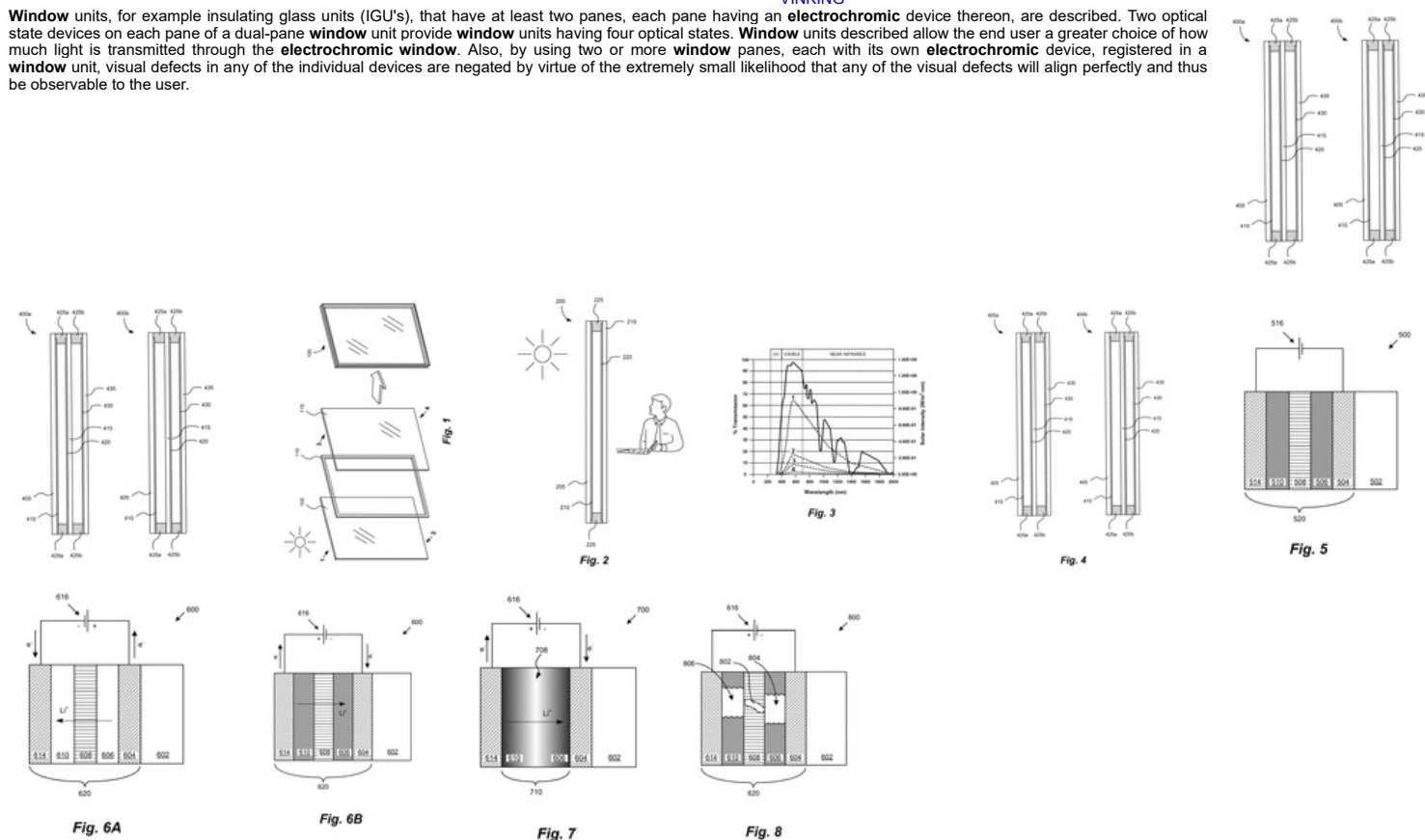




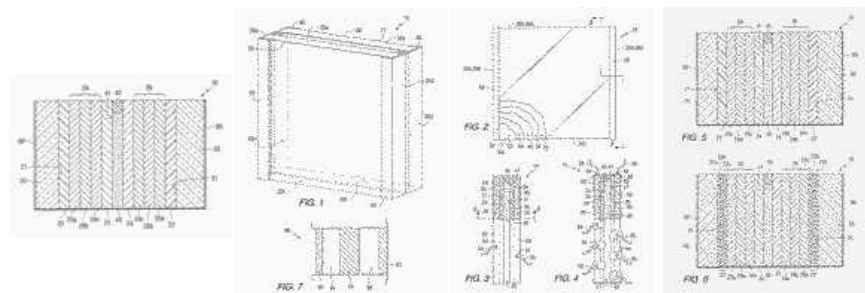
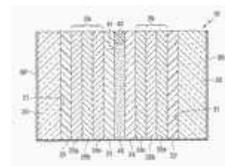
An **electrochromic** device is structured to selectively heat one or more particular regions of a **conductive** layer of the **electrochromic** device. An electrical potential difference can be induced across the **conductive** layer to heat one or more layer regions. The **conductive** layer can be one of at least two **conductive** layers on opposite sides of an **electrochromic** film stack, and an electrical potential difference can be induced between the **conductive** layers to cause at least some of the **electrochromic** film stack to change transmission levels. The **conductive** layer can include regions with different sheet resistances, so that one or more regions are structured to generate more heat than other regions of the **conductive** layer when an electrical potential difference is induced across the **conductive** layer. Separate layer regions can include separate chemical species. The **conductive** layer can be geometrically structured so that some layer regions have a greater sheet resistance than other regions.



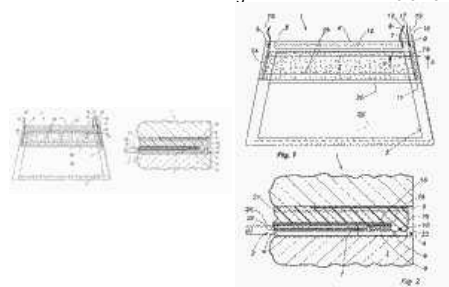
Window units, for example insulating glass units (IGU's), that have at least two panes, each pane having an **electrochromic** device thereon, are described. Two optical state devices on each pane of a dual-pane **window** unit provide **window** units having four optical states. **Window** units described allow the end user a greater choice of how much light is transmitted through the **electrochromic window**. Also, by using two or more **window** panes, each with its own **electrochromic** device, registered in a **window** unit, visual defects in any of the individual devices are negated by virtue of the extremely small likelihood that any of the visual defects will align perfectly and thus be observable to the user.



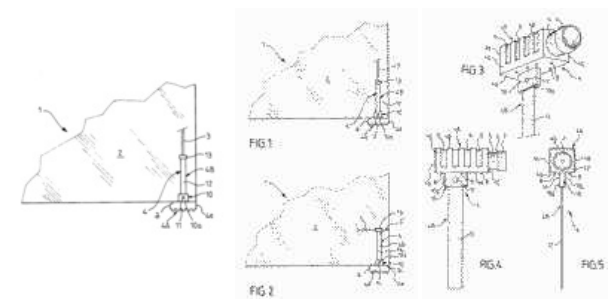
An **electrochromic** switchable transparency, e.g. a **window** and/or a mirror includes an **electrochromic** switchable medium between a pair of electrode assemblies. At least one of the electrode assemblies is transparent to visible light and includes an electrode over a surface. In one nonlimiting embodiment of the invention, the electrode has two electrically conducting layers and a bridging layer between and interconnecting the two electrically conducting layers. In one nonlimiting embodiment, the bridging layer includes a high electrically resistance connecting layer to provide the electrode with a **heating** layer to heat the surface and/or a current conducting layer to pass current to the medium. In another nonlimiting embodiment, the bridging layer includes an electrically connecting layer to pass current to electrically enhance the first electrically **conductive** layer. In another nonlimiting embodiment, the electrically conducting layers are silver films to reduce infrared transmission through the first electrode assembly.



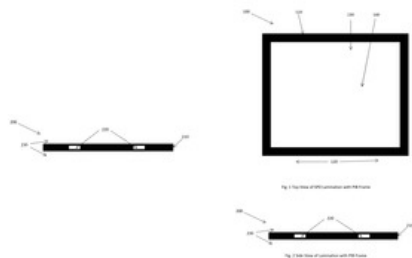
The invention relates to a transparent **window** panel with a field of view that can be darkened on part of the surface thereof, by electrically controlling at least one functional **element** which is built into a composite material comprising several layers, the transmission of light being reversibly variable. The aforementioned functional **element**, which, in particular, takes the form of a solid **electrochromic** layer system, comprises at least one **electrochromic** functional layer which is enclosed between two surface electrodes. According to the invention, the surface electrodes (2E, 4) of the functional **element** (2) and the connectors thereof (12, 14, 16, 18, 19, 20) are adapted to one another and are disposed spatially in relation to one another such that the darkening process begins at one edge of the functional **element** and, under a remaining voltage applied between the surface electrodes (2E, 4), propagates continuously over the surface thereof until it has been completely and uniformly coloured. The invention also relates to a method of controlling one such functional **element**, which can preferably be used as an electrically-controlled sun visor for vehicle windscreens and similar.



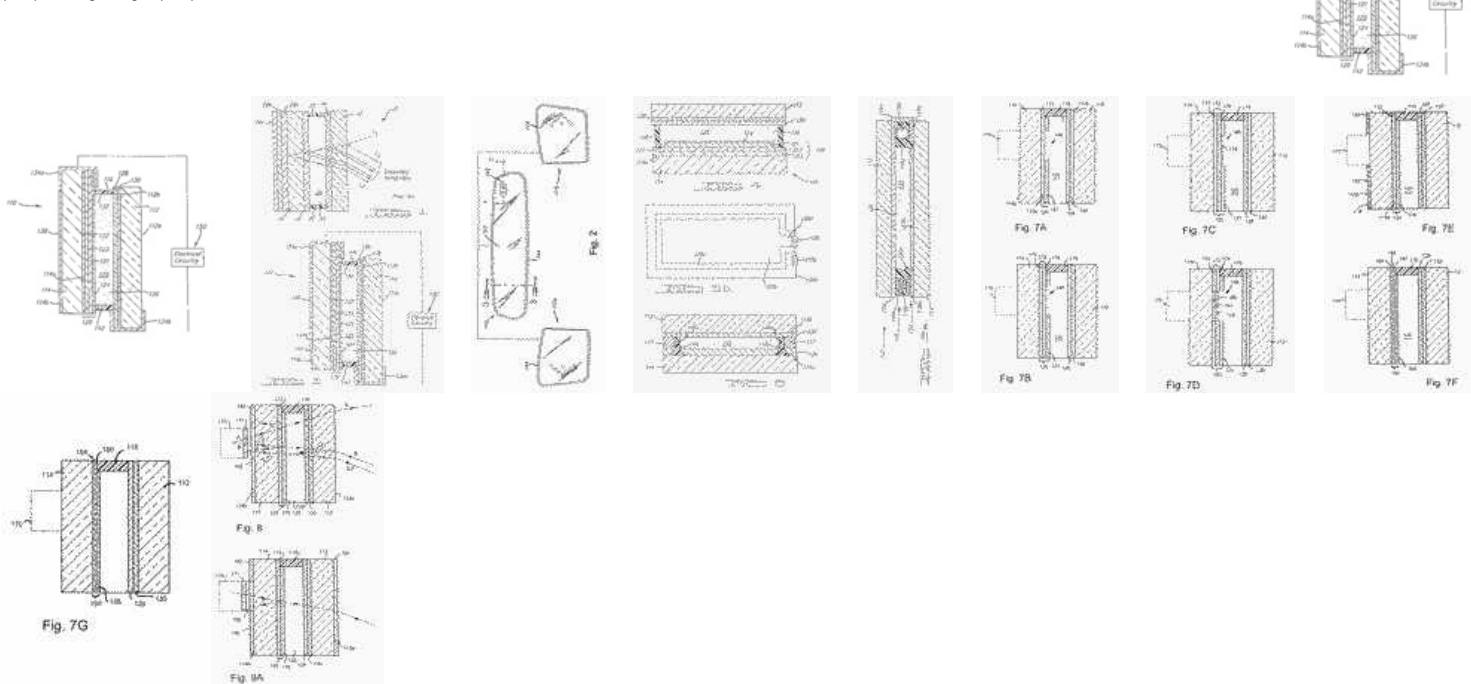
The invention relates to a connection device (4) intended for **laminated glazing** (1) that is to be electrically connected to an apparatus outside the **glazing**, said **laminated glazing** (1) including at least one assembly comprising two glass sheets (2) having a separator **lamination** sheet and at least one current lead (3) disposed therebetween. The connection device (4) includes conducting parts that extend inside and outside the **glazing** (1), the internal conducting region (12) being intended to be connected to the aforementioned current lead(s) (3) and the external conducting region being intended to be connected to the apparatus outside the **glazing** and being protected by an insulating sheath. The invention is characterised in that the external conducting region, together with the insulating sheath thereof, is produced in the form of a casing (4A) for establishing a wiring connection to the apparatus, said casing (4A) including a means for receiving the conducting part inside the glass sheet.



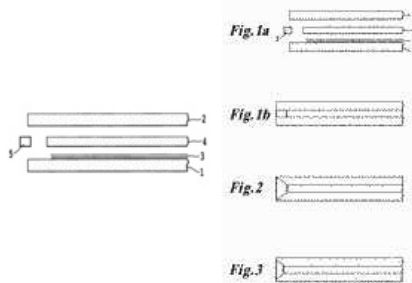
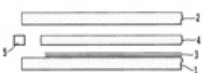
A **laminated glazing** including a moisture-sensitive functional insert included within the **glazing**, the **laminated glazing** comprising a stack comprised of a plurality of glass or plastic plies, the plies being joined together by interlayers located between the plies, wherein a central area of the stack comprises at least one optically clear interlayer; the stack further including a moisture-sensitive functional insert; wherein an inner perimeter of the **laminated glazing** is formed with a frame comprised of a hydrophobic moisture-resistant material, the frame having a thickness substantially corresponding to a combined thickness of the interlayers within the **glazing** plus the insert. In addition, a method of reducing or eliminating exposure of a moisture-sensitive insert within a **laminated glazing** constructed as above is also described herein.



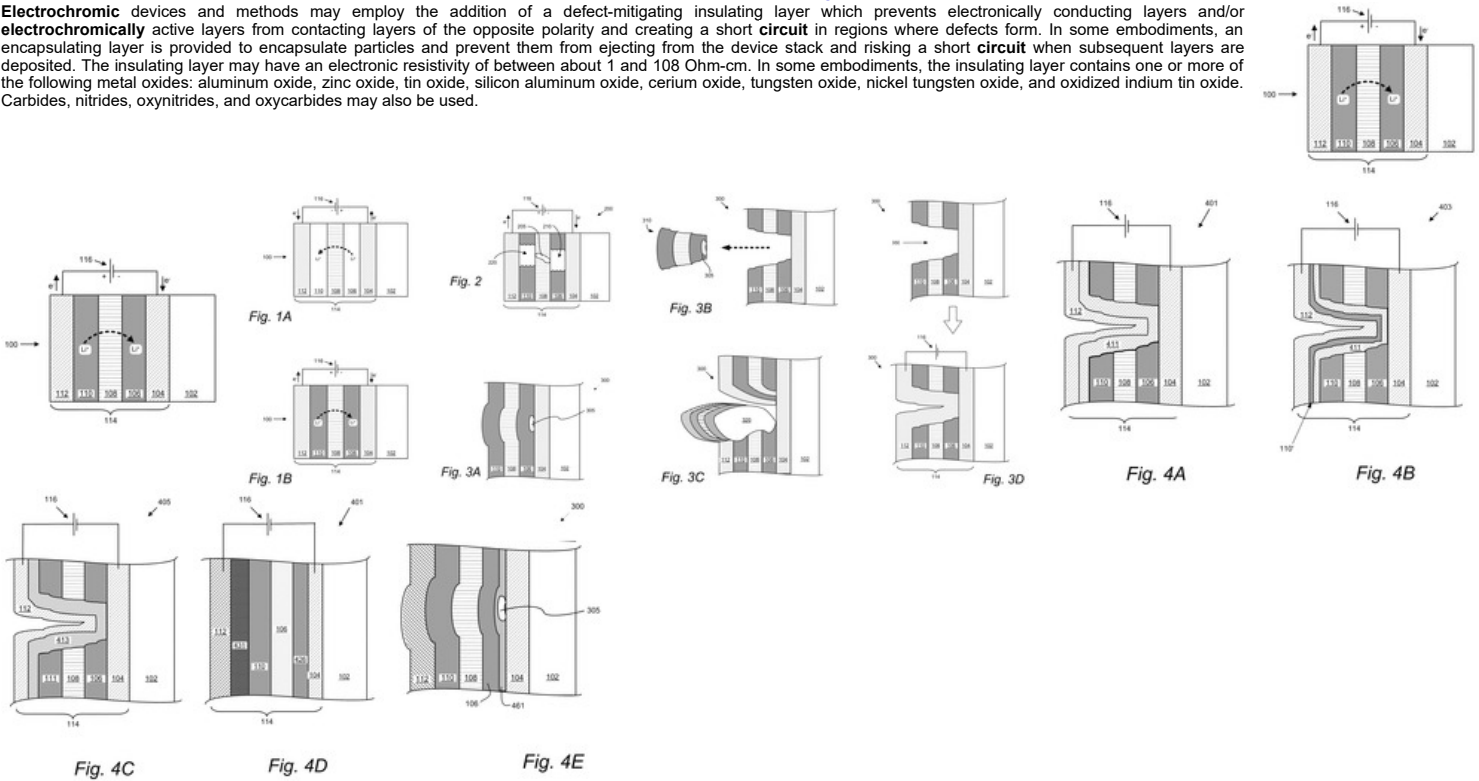
An **electrochromic mirror** is disclosed for use in a vehicle rearview mirror assembly (110) having an electronic device (160, 170, 220, 725) positioned behind the **electrochromic mirror** for selectively projecting and/or receiving light through the mirror. The **electrochromic mirror** includes an electrode (120) that includes a layer of reflective material (121) and a **coating** of electrically **conductive** material (172) that is at least partially transmissive. The second electrode further includes a region (146) in front of the electronic device that is at least partially transmissive. The electrically **conductive coating** may include a single transparent layer or a plurality of partially reflective and transmissive layers, or an electrically **conductive dichroic coating**. The electronic device may be a light sensor (160) or a light source such as an information display (170) or a signal light (220).



The invention concerns a **laminated glazing** comprising two substrates (1, 2) between which is provided an active system (3), the **glazing** is provided with first peripheral sealing means (5), in particular proof against water in vapour form, comprising at least a joint based on thermofusible polymer(s) selected among at least one of the following polymer families: vinylacetate-ethylene, polyisobutylene, polyamide, or based on a sealant, in particular derived from polyurethane, polysulphide or silicone. Said joint can also be associated with mechanical reinforcement and/or spacing calibration means between the two substrates.



Electrochromic devices and methods may employ the addition of a defect-mitigating insulating layer which prevents electronically conducting layers and/or **electrochromically** active layers from contacting layers of the opposite polarity and creating a short **circuit** in regions where defects form. In some embodiments, an encapsulating layer is provided to encapsulate particles and prevent them from ejecting from the device stack and risking a short **circuit** when subsequent layers are deposited. The insulating layer may have an electronic resistivity of between about 1 and 108 Ohm-cm. In some embodiments, the insulating layer contains one or more of the following metal oxides: aluminum oxide, zinc oxide, tin oxide, silicon aluminum oxide, cerium oxide, tungsten oxide, nickel tungsten oxide, and oxidized indium tin oxide. Carbides, nitrides, oxynitrides, and oxycarbides may also be used.



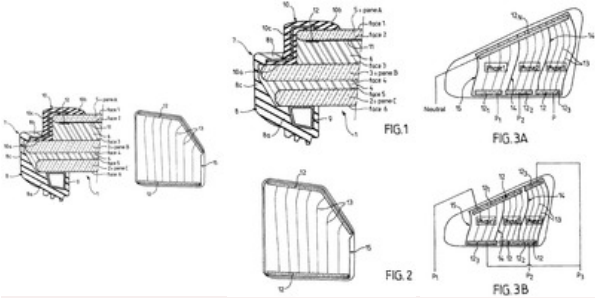
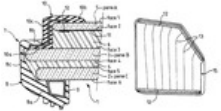
14.
- Method for the production of electrochromic composite bodies, and electrochromic composite bodies
- WO2004074920
- 2003-02-19
- BASF*
- 2004-09-02
- 2004-09-02

Disclosed is a method for producing **electrochromic** composite bodies, according to which at least one **electrochromic** functional layer, an electrolyte layer, and a sealant are respectively applied to an optically transparent, electron-**conductive** surface of a first and a second substrate, whereupon the substrates are pressed together. Also disclosed are composite bodies, especially composite glazings, which are produced by means of the inventive method.

$$I_{\text{tot}} = \sum_{j=1}^N I_j$$

15.
- Heated laminated glass pane having an improved vision comfort
- FR2888082
- 2005-06-30
- SAINT GOBAIN GLASS*
- 2007-01-05
- 2007-01-05

This **laminated** glass pane comprises at least two superimposed plies (A, B, C) of a transparent substrate, which is mechanically resistant, with the placement of an interlayer (4; 6), which is made of transparent material, between two adjacent plies. The glass pane also comprises, in its thickness or on the surface, at least one thin transparent **conductive** layer (11) extending over a portion of at least the pane, said layer or said layers (11) being heated for defrosting and/or for defogging by Joule effect, at least one thin layer (11) comprising flux boundary lines formed by engraving for guiding the intensity of current from one strip to the other. The width of these flux boundary lines is selected so that it is small enough to render them invisible to the naked eye in the **laminated** heated glass pane.



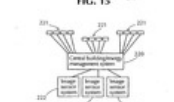
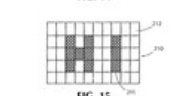
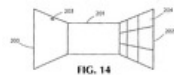
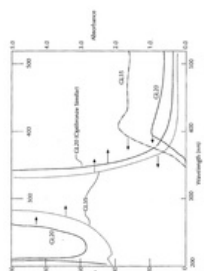
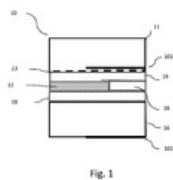
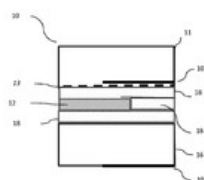
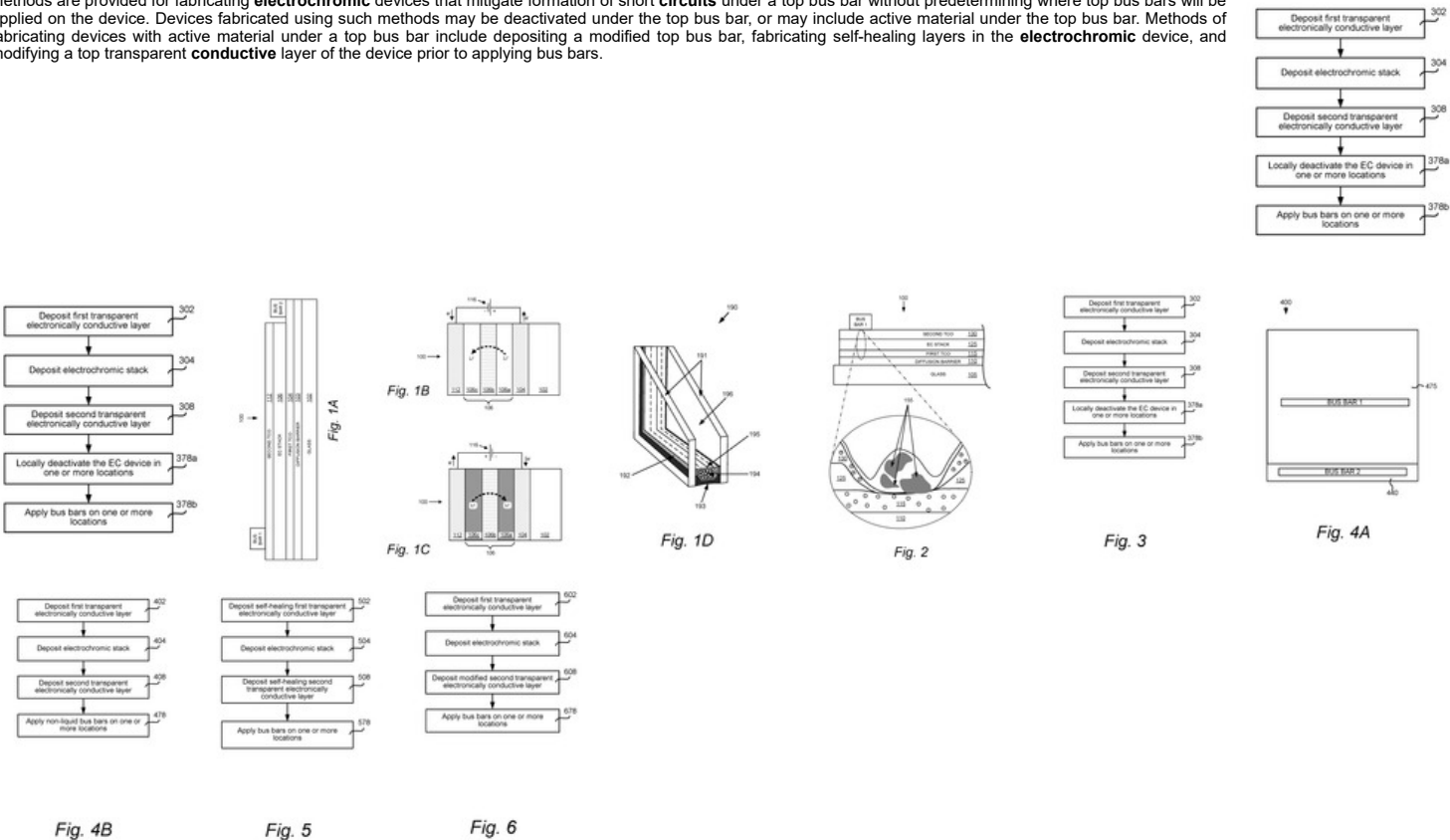
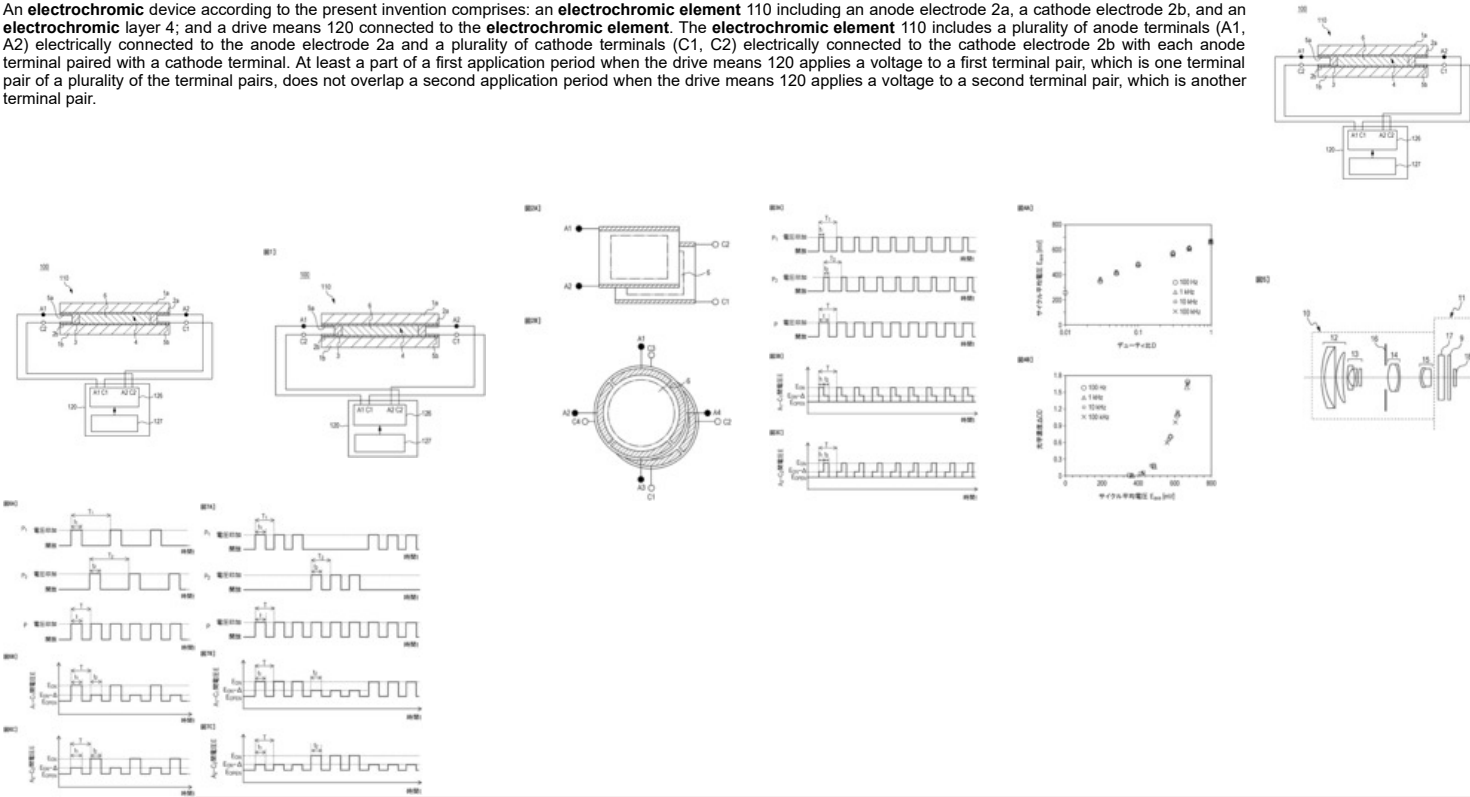

$$C = \sqrt{a^2 + b^2} \text{ and } h = \tan^{-1}(b/a).$$
[illegible]

Fig. 1

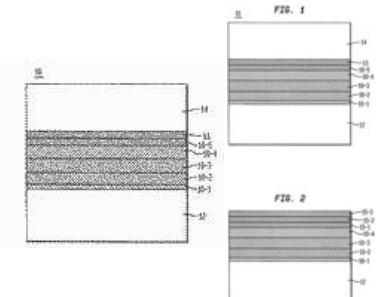
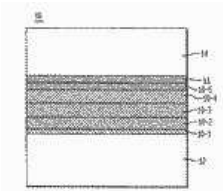
Methods are provided for fabricating **electrochromic** devices that mitigate formation of short **circuits** under a top bus bar without predetermining where top bus bars will be applied on the device. Devices fabricated using such methods may be deactivated under the top bus bar, or may include active material under the top bus bar. Methods of fabricating devices with active material under a top bus bar include depositing a modified top bus bar, fabricating self-healing layers in the **electrochromic** device, and modifying a top transparent **conductive** layer of the device prior to applying bus bars.



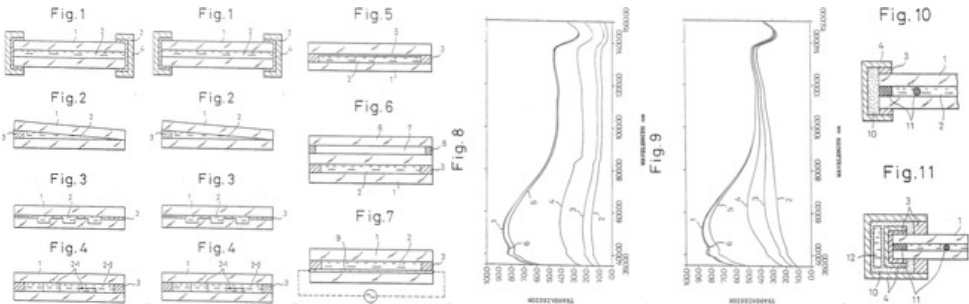
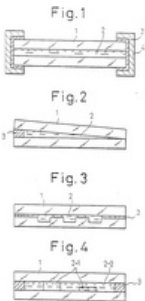
An **electrochromic** device according to the present invention comprises: an **electrochromic element** 110 including an anode electrode 2a, a cathode electrode 2b, and an **electrochromic** layer 4; and a drive means 120 connected to the **electrochromic element**. The **electrochromic element** 110 includes a plurality of anode terminals (A1, A2) electrically connected to the anode electrode 2a and a plurality of cathode terminals (C1, C2) electrically connected to the cathode electrode 2b with each anode terminal paired with a cathode terminal. At least a part of a first application period when the drive means 120 applies a voltage to a first terminal pair, which is one terminal pair of a plurality of the terminal pairs, does not overlap a second application period when the drive means 120 applies a voltage to a second terminal pair, which is another terminal pair.



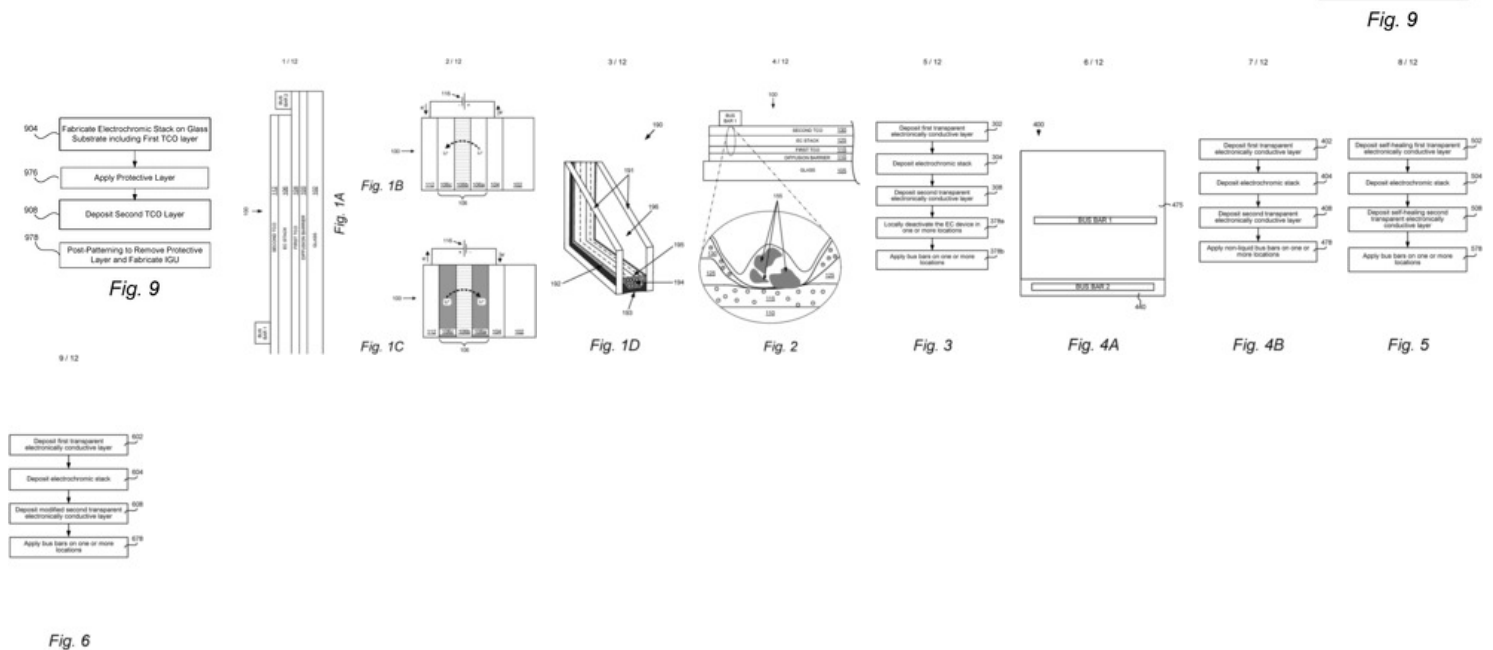
Electrochromic devices applied to a substrate (12) are disclosed, including an **electrochromic** electrode layer (20), a counterelectrode layer (24), and an ion-conducting layer (22) sandwiched between those two layers and electrically isolating them from each other, in which the ion-conducting layer (22) is substantially uniform across the substrate and comprises an inorganic superstructure with associated organic material and with a microstructure which facilitates the transfer of ions. Methods for producing these devices are also disclosed, including depositing the ion-conducting layer (22) on the substrate (12) in the form of a solution, and effecting gelation of that solution.



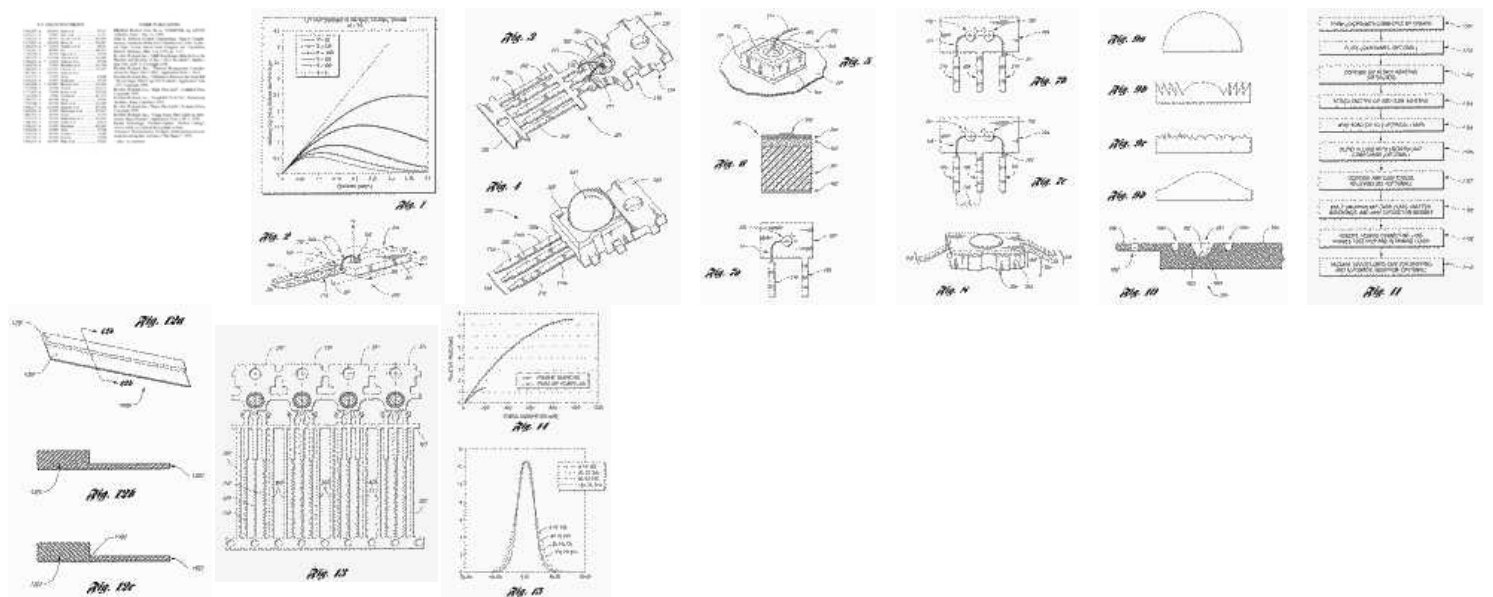
In an autonomously responsive **laminate** formed by sealing an isotropic aqueous solution, in which the polysaccharide derivative dissolved in water aggregates due to a temperature rise to cause the cloudy scattering thereof to occur, in a cell at least part of which is transparent and through which this aqueous solution can be seen directly, the isotropic aqueous solution consists of a solution obtained by dissolved 100 parts by weight of polysaccharide derivative of weight average molecular weight of about 10,000-200,000 in about 110-2,000 parts by weight of a water medium composed of water the quantity of which corresponds to about 25-450 parts by weight with respect to 100 parts by weight of the polysaccharide derivative and amphipathic substance. This **laminate** can be manufactured by sealing an isotropic aqueous solution in a cell which is transparent at at least a part thereof, and which permits the aqueous solution to be seen directly therethrough, and it can be used advantageously as a **window**. <IMAGE>



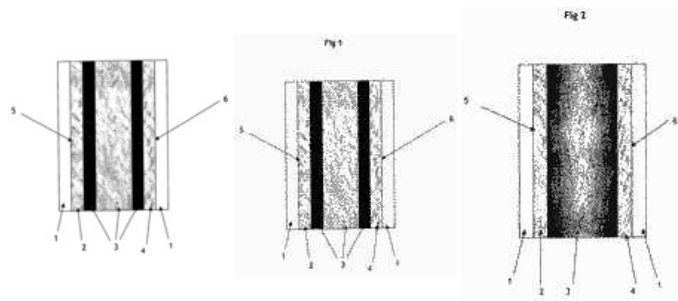
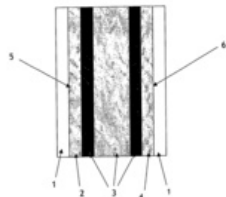
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According to one embodiment of the present invention, an **electrochromic** rearview mirror assembly for a vehicle includes an **electrochromic** mirror (110, 920) having a variable reflectivity, a glare sensor (160, 234) for sensing levels of light directed towards the front **element** from the rear of the vehicle, an ambient sensor (232) for sensing levels of ambient light, a display (146, 170) positioned behind the partially transmissive, partially reflective portion of the reflector for displaying information therethrough; and a control **circuit** (230, 900) coupled to the sensors and the display. The control **circuit** determines whether daytime or nighttime conditions are present as a function of the ambient light level sensed by the glare sensor to control a contrast ratio of light originating from the display and light reflecting from the partially transmissive, partially reflective area of the reflector.



The invention concerns an electrically-operated device with variable transmission or reflection optical/energetic properties, comprising at least one support substrate provided with a stack of layers with **electrochromic** function comprising at least two active **electrochromic** layers, separated by an electrolyte, said stack being arranged between two electrical leads, respectively lower and upper (lower corresponding to the electrical lead closes to the support substrate, as opposed to the upper electrical lead furthest from said substrate). The invention is characterized in that the **electrochromic** material constituting the two active layers is identical, and said **electrochromic** material is selected among those whereof the colouring is not a linear function of the loads introduced.



The invention relates to an electrically-controllable device with variable optical/energy reflection or transmission properties. The invention is characterised in that the device is shaped in the form of a self-supporting film, said film being formed from a mixture comprising at least one first **element** which provides the mixture with an **electrochrome** functionality and at least one second **element** which produces an electrolyte functionality for ionic charge transfer within said mixture.

