

Field of the Invention

10 Background of the Invention

30 In place of the air gap, US Patent 5,166,814 describes a plurality of membranes each of which are filled with a substantially transparent liquid to shield against impacts on an LCD assembly. Although the membranes may be thinner than the air gap, any breaks in any of the membranes can cause the transparent liquid within to spill into circuitry surrounding the
35 LCD assembly. Furthermore, such membranes can be expensive and assembling them with the LCD assembly can be difficult.

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Summary of the Invention

It is an object of this invention to provide a display assembly with features to protect against breakage.

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According to one aspect of the invention, there is provided a display assembly comprising:

a display portion;

a lens; and

10 a resilient mesh mounted between said display portion and said lens to cushion impacts on said display portion from said lens.

Preferably, said resilient mesh can be formed with a substantially transparent material.

15

Suitably, said resilient mesh can have a honey comb structure.

Alternatively, said resilient mesh can form a grid.

20 Preferably, said display assembly can further comprise mounting means for mounting said resilient mesh.

Suitably, said mounting means can comprise part of a housing for an electronic device.

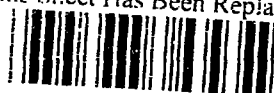
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Preferably, said mounting means can comprise an adhesive.

Suitably, said display assembly can include a layer of liquid crystals.

30 Alternatively, said display assembly can include an array of light emitting diodes.

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Brief Description of the Drawings

In order to describe the invention and to put it into practical effect,
reference will now be made to preferred embodiments as illustrated with
5 reference to the accompanying drawings in which:

FIG. 1 is a sectional view of a display assembly in accordance with the
invention;

10 FIG. 2 is a plan view of a first preferred embodiment of a resilient
mesh of the display assembly of FIG. 1; and

FIG. 3 is a plan view of a second preferred embodiment of a resilient
mesh of the display assembly of FIG. 1.

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Detailed Description of the Invention

FIG. 1 is a sectional view of a display assembly 10 in accordance with
20 the invention. Display assembly 10 comprises a display portion 12, a
lens 14 and a resilient mesh 16. Display portion 12 can be, for example, a
layer 18 of liquid crystals or an array of light emitting diodes (LEDs).
Display portion includes a substrate 20 and is covered by a transparent
sheet 22 such as glass. Lens 14 is mounted to a housing 24 for an
25 electronic device (not shown). Display assembly 10 includes mounting
means for mounting resilient mesh 16. Mounting means comprises two
attachment slots 26 formed on part of housing 24. In addition to attachment
slots 26 or as an alternative, an adhesive can be used to attach resilient
mesh 16 to display portion 12 or to lens 14.

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Resilient mesh 16 is formed with a substantially transparent
material 28 so that display portion 12 can be viewed. One possible material
to form transparent material 28 is silicone rubber. A first preferred
embodiment of resilient mesh 16 is shown in FIG. 2. Resilient mesh 16 in
35 the first preferred embodiment has a honey comb structure. FIG. 3 shows a
second preferred embodiment of resilient mesh 16 forming a grid.



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Advantageously, the invention protects display portion 12 against breakage due to impacts from lens 14. Mounting resilient member 16 between display portion 12 and lens 14 cushions such impacts on display portion 12. Furthermore, forming resilient member 16 with the substantially transparent material 26 ensures that information on display portion 12 can
5 be viewed. Hence, for example, alphanumeric characters "AB78" can be viewed through resilient mesh 16 as shown in FIGs. 2 and 3.

Although the invention has been described with reference to preferred
10 embodiments, it is to be understood that the invention is not restricted to the preferred embodiments described herein.

We claim:

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Claims

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1. A display assembly comprising:
a display portion;
5 a lens; and
a resilient mesh mounted between said display portion and said lens to cushion impacts on said display portion from said lens.
2. The display assembly as claimed in Claim 1 wherein said resilient
10 mesh is formed with a substantially transparent material.
3. The display assembly as claimed in Claim 1 wherein said resilient mesh has a honey comb structure.
- 15 4. The display assembly as claimed in Claim 1 wherein said resilient mesh forms a grid.
5. The display assembly as claimed in Claim 1 wherein said display
assembly further comprises mounting means for mounting said resilient
20 mesh.
6. The display assembly as claimed in Claim 5 wherein said mounting means comprises part of a housing for an electronic device.
- 25 7. The display assembly as claimed in Claim 5 wherein said mounting means comprises an adhesive.
8. The display assembly as claimed in Claim 1 wherein said display
assembly includes a layer of liquid crystals.
30
9. The display assembly as claimed in Claim 1 wherein said display assembly includes an array of light emitting diodes.
10. A display assembly comprising a display portion, a lens and a
35 resilient mesh substantially as described herein with reference to and as illustrated by the accompanying drawings.

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DISPLAY ASSEMBLY

Abstract of the Disclosure

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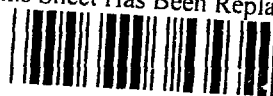
A display assembly (10) with a display portion (12), a lens (14) and a resilient mesh (16). Display portion (12) has a layer (18) of liquid crystals and a substrate (20). A transparent sheet (22) such as glass covers display portion (12). Lens 14 is mounted to a housing (24) for an electronic device (not shown). Display assembly (10) has two attachment slots (26) formed on part of housing (24) for mounting resilient mesh (16). Resilient mesh (16) is formed with a substantially transparent material (28) so that display portion (12) can be viewed by a user of the electronic device.

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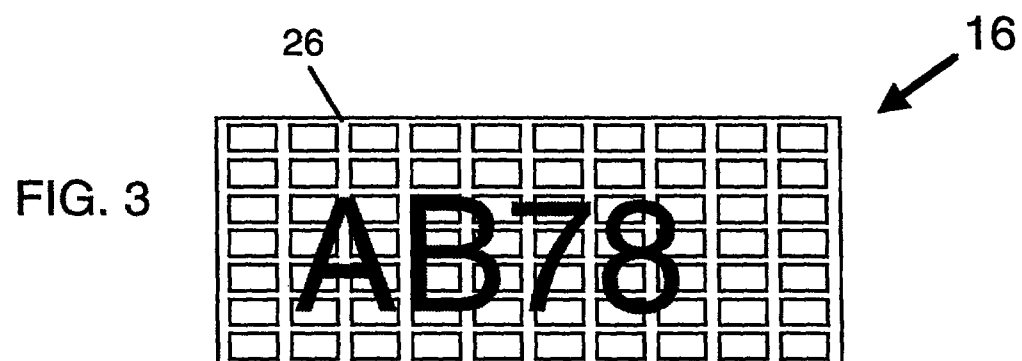
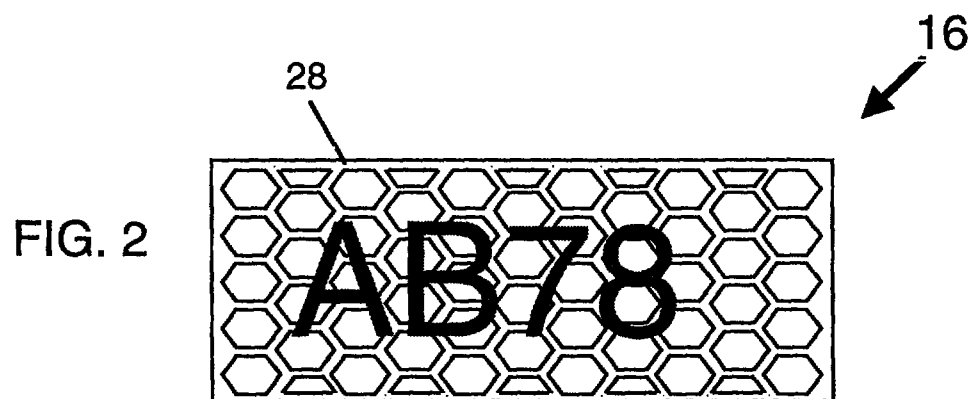
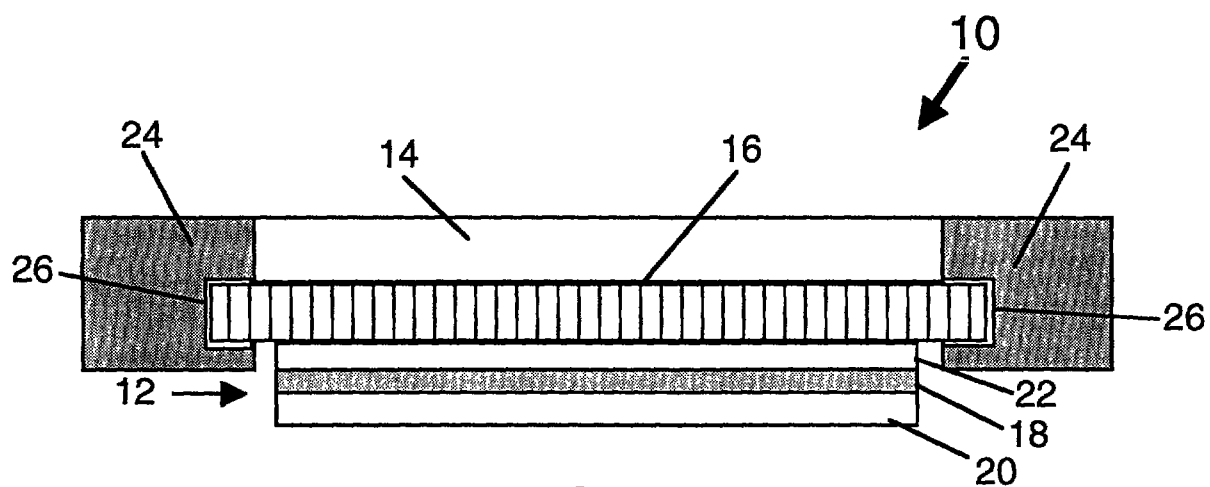
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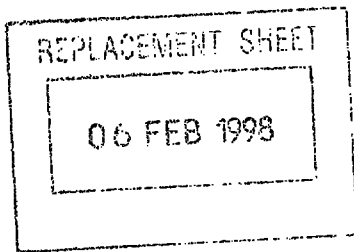
FIG. 1 accompanies this abstract.

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DISPLAY ASSEMBLY

Field of the Invention

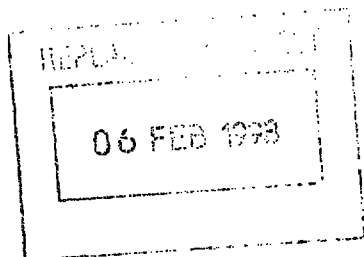
5 This invention relates to display assemblies. In particular, this invention relates to, but is not necessarily limited to a display assembly with features to protect against breakage.

10 Background of the Invention

Display assemblies of electronic devices are known to provide information to users. Such information is displayed on the display assemblies with, for example, liquid crystals. A liquid crystal display (LCD) assembly typically has two or more transparent sheets that sandwich a layer of liquid crystals. Transparent sheets, such as glass, are placed over a display portion of the LCD assembly so as not to block the information being viewed. Plastics can also be used in place of glass but the transparency of plastics tend to degrade due to heat or over time and this adversely affects viewing.

The LCD assembly is typically placed within a recess of a housing for an electronic device and a lens is then mounted to the housing to cover the recess. However, when such an electronic device sustains physical shock or impact, the glass can break due to deflection of the lens or the LCD assembly towards each other. One solution to this problem is to allow an air gap between the lens and the LCD assembly. Although a thick air gap is desirable, thickness of such an air gap has to be balanced against space available within the housing and, therefore, damage from impacts to the LCD assembly is still a problem for small electronic devices.

30 In place of the air gap, US Patent 5,166,814 describes a plurality of membranes each of which are filled with a substantially transparent liquid to shield against impacts on an LCD assembly. Although the membranes may be thinner than the air gap, any breaks in any of the membranes can cause the transparent liquid within to spill into circuitry surrounding the
35 LCD assembly. Furthermore, such membranes can be expensive and assembling them with the LCD assembly can be difficult.



Summary of the Invention

It is an object of this invention to provide a display assembly with features to protect against breakage.

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According to one aspect of the invention, there is provided a display assembly comprising:

a display portion;

a lens; and

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a resilient mesh mounted between said display portion and said lens to cushion impacts on said display portion from said lens.

Preferably, said resilient mesh can be formed with a substantially transparent material.

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Suitably, said resilient mesh can have a honey comb structure.

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Preferably, said display assembly can further comprise mounting means for mounting said resilient mesh.

Suitably, said mounting means can comprise part of a housing for an electronic device.

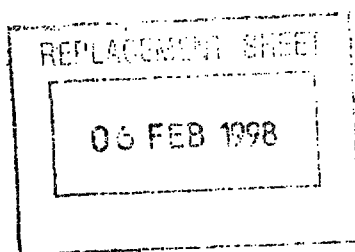
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Preferably, said mounting means can comprise an adhesive.

Suitably, said display assembly can include a layer of liquid crystals.

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Alternatively, said display assembly can include an array of light emitting diodes.



Brief Description of the Drawings

In order to describe the invention and to put it into practical effect, reference will now be made to preferred embodiments as illustrated with
5 reference to the accompanying drawings in which:

FIG. 1 is a sectional view of a display assembly in accordance with the invention;

10 FIG. 2 is a plan view of a first preferred embodiment of a resilient mesh of the display assembly of FIG. 1; and

FIG. 3 is a plan view of a second preferred embodiment of a resilient mesh of the display assembly of FIG. 1.

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Detailed Description of the Invention

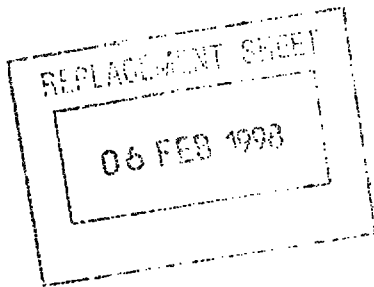
FIG. 1 is a sectional view of a display assembly 10 in accordance with
20 the invention. Display assembly 10 comprises a display portion 12, a lens 14 and a resilient mesh 16. Display portion 12 can be, for example, a layer 18 of liquid crystals or an array of light emitting diodes (LEDs). Display portion includes a substrate 20 and is covered by a transparent sheet 22 such as glass. Lens 14 is mounted to a housing 24 for an
25 electronic device (not shown). Display assembly 10 includes mounting means for mounting resilient mesh 16. Mounting means comprises two attachment slots 26 formed on part of housing 24. In addition to attachment slots 26 or as an alternative, an adhesive can be used to attach resilient mesh 16 to display portion 12 or to lens 14.

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Resilient mesh 16 is formed with a substantially transparent material 28 so that display portion 12 can be viewed. One possible material to form transparent material 28 is silicone rubber. A first preferred embodiment of resilient mesh 16 is shown in FIG. 2. Resilient mesh 16 in
35 the first preferred embodiment has a honey comb structure. FIG. 3 shows a second preferred embodiment of resilient mesh 16 forming a grid.

Advantageously, the invention protects display portion 12 against breakage due to impacts from lens 14. Mounting resilient member 16 between display portion 12 and lens 14 cushions such impacts on display portion 12. Furthermore, forming resilient member 16 with the substantially transparent material 26 ensures that information on display portion 12 can be viewed. Hence, for example, alphanumeric characters "AB78" can be viewed through resilient mesh 16 as shown in FIGs. 2 and 3.

Although the invention has been described with reference to preferred embodiments, it is to be understood that the invention is not restricted to the preferred embodiments described herein.

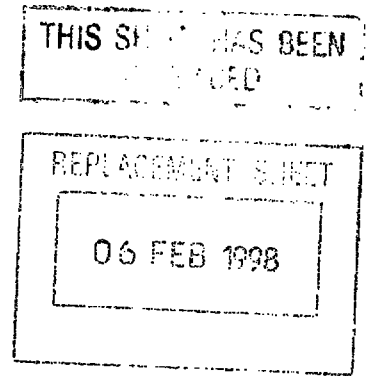




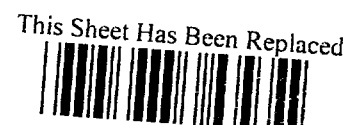
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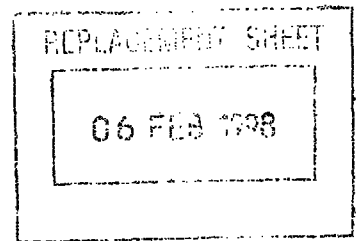
Claims

We claim:



- 5 1. A display assembly comprising:
 a display portion;
 a lens; and
 a resilient mesh mounted between said display portion and said
 lens to cushion impacts on said display portion from said lens.
- 10 2. The display assembly as claimed in Claim 1 wherein said resilient
 mesh is formed with a substantially transparent material.
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5. The display assembly as claimed in Claim 1 wherein said display
20 assembly further comprises mounting means for mounting said resilient
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6. The display assembly as claimed in Claim 5 wherein said
 mounting means comprises part of a housing for an electronic device.
- 25 7. The display assembly as claimed in Claim 5 wherein said
 mounting means comprises an adhesive.
8. The display assembly as claimed in Claim 1 wherein said display
30 assembly includes a layer of liquid crystals.
9. The display assembly as claimed in Claim 1 wherein said display
 assembly includes an array of light emitting diodes.
- 35 10. A display assembly comprising a display portion, a lens and a
 resilient mesh substantially as described herein with reference to and as
 illustrated by the accompanying drawings.



DISPLAY ASSEMBLY

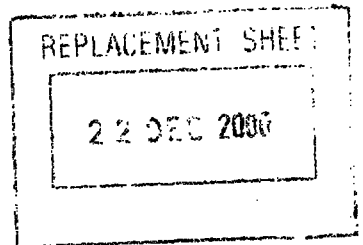
Abstract of the Disclosure

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A display assembly (10) with a display portion (12), a lens (14) and a resilient mesh (16). Display portion (12) has a layer (18) of liquid crystals and a substrate (20). A transparent sheet (22) such as glass covers display portion (12). Lens 14 is mounted to a housing (24) for an electronic device (not shown). Display assembly (10) has two attachment slots (26) formed on part of housing (24) for mounting resilient mesh (16). Resilient mesh (16) is formed with a substantially transparent material (28) so that display portion (12) can be viewed by a user of the electronic device.

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FIG. 1 accompanies this abstract.



We claim:

- 5 1. A display assembly comprising:
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 a resilient mesh mounted between said display portion and said
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