

Patent Owner e-Vision Optics, LLC

U.S. Patent No. 8,905,541
IPR2024-01071

October 6, 2025

King & Spalding LLP

IPR2024-01071
e-Vision Optics, LLC EX-2021

Table of Issues

ISSUE	CLAIM(S)	SLIDES
1. Does the combination of Howell-596 and Howell-158 disclose an “electronics module?”	Cl. 12	3-13
2. Does prior art render obvious the “insulating layer”?	Cls. 1-18	14-27
3. Does the eyewear of Della and Dudli disclose the width limitations of claim 18?	Cl. 18	28-34

Issue 1: Whether Howell-158's double-sided sticky tape teaches or renders obvious the claimed "electronics module" (Claim 12)

Ground 1

'541 Patent, Claims 1, 12

1. A first device, comprising:

a frame comprising a first temple and a second temple, wherein the frame comprises a housing module coupled to a structural member;

a first lens and a second lens coupled to the frame;
and

an electronics module, wherein the electronics module is located within the housing module;

wherein the electronics module comprises at least any two of: a power source; a controller; and a sensing mechanism; and

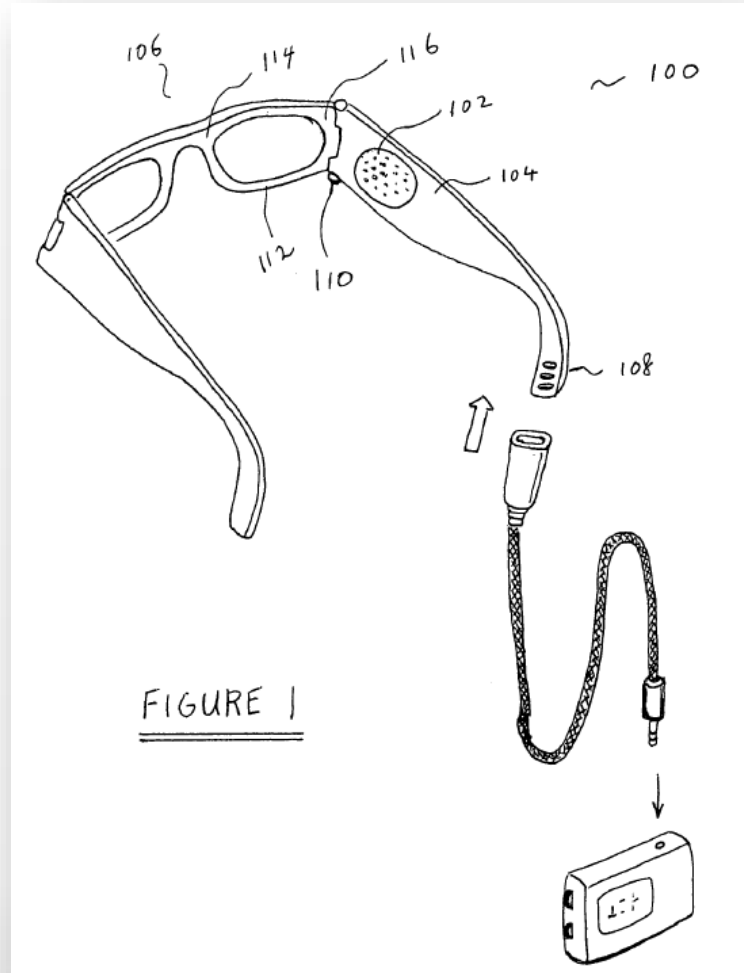
wherein an insulating layer is disposed between one or more electronic components located within the electronics module and the frame of the first device.

12. The first device of claim 1, wherein the structural member comprises a cavity in the first temple; and wherein the housing module is configured to be selectively placed within the cavity.

Petitioner’s Challenge to Claim 12

Ground	References	Claims
<u>GROUND 1</u>	<u>Howell-596, Howell-158</u>	<u>1-11, 12, 13-19</u>
GROUND 2	Howell-596, Howell-158, Hattori-913	16-17
GROUND 3	Howell-596	1-11, 13-19
GROUND 4	Howell-596, Hattori-913	16-17
GROUND 5	Kokonaski-166, Howell-158	1-9, 11, 13-19
GROUND 6	Kokonaski-999, Howell-158	1-9, 11, 13-19

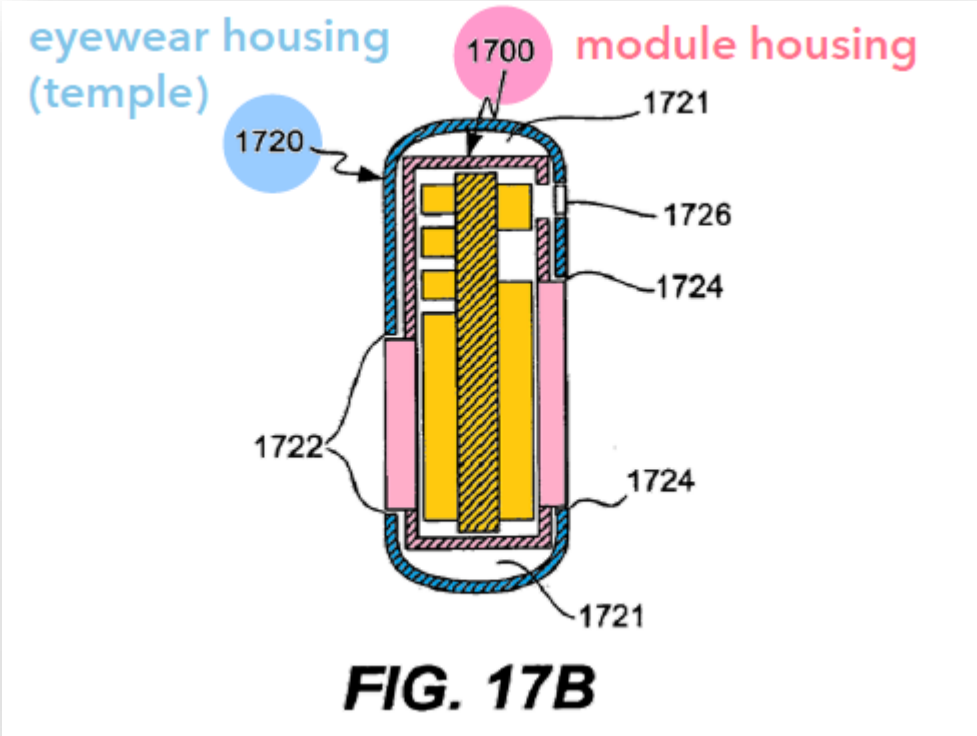
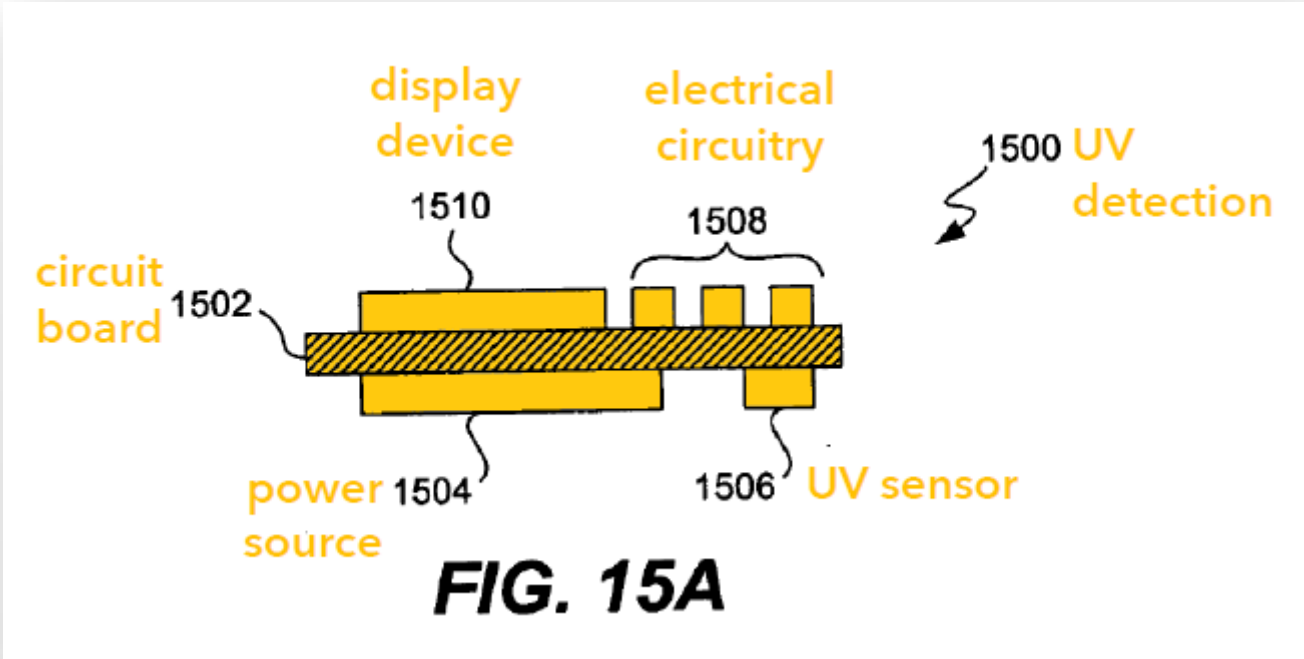
Howell-158 (Ground 1)



[0053] For glasses with metallic frames, to prevent circuits from being shorted or to reduce leakage current, one embodiment provides an insulating layer between the electrical components or circuit board and the metallic frames.

One example of an insulating layer is a tape to encapsulate the electrical components. The tape is non-conducting so as to provide insulation and, to a certain degree, can also provide mechanical stiffness. One way to make such temples is to have two sheets of the metal die-stamped to form the two halves, or the two faces of the temple piece. A circuit board is made to fit into the space between the faces. Then, two die-cut pieces of insulator material (e.g., dielectric tape) can cover the top and the bottom surfaces of the circuit board. The board is then sandwiched between the faces to form the temple. In one example, the dielectric tape can be double-sided sticky tape, with one side sticking to the circuit board, and the other side sticking to the temple. An adhesive can be used to glue the two faces of the temple piece together.

Howell-596 (Ground 1)



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Petitioner's Reliance on the '541 Patent Specification

Indeed, the '541 patent expressly discloses that its “insulating layer may comprise the exterior wall of the electronics module.” Ex.1001, 59:18-19; *see also id.*, 58:50-55 (“[W]here an electronics module comprises an exterior wall ... that is made of ... an insulating material, the exterior wall may be considered as the insulating layer disposed between the electronic components (that are disposed within the electronics module) and the frame.”), 2:20-21 (“the insulating layer may

prise a part of the electronics module. That is, for instance, in some embodiments the insulating layer may comprise the exterior wall of the electronics module, or some other internal component that isolates the electronics disposed within from

environment. Thus, as used herein, in some embodiments where an electronics module comprises an exterior wall (e.g. an outer wall, container, shell, etc.) that is made of, or includes, an insulating material, the exterior wall may be considered as the insulating layer disposed between the electronic components (that are disposed within the electronics module) and the frame. For example, in some embodiments, the outer wall (or the container) of the electronics module (or

Howell-158's Disclosure of an "Insulating Layer"



[0053] For glasses with metallic frames, to prevent circuits from being shorted or to reduce leakage current, one embodiment provides an insulating layer between the electrical components or circuit board and the metallic frames.

One example of an insulating layer is a tape to encapsulate the electrical components. The tape is non-conducting so as to provide insulation and, to a certain degree, can also provide mechanical stiffness. One way to make such temples is to have two sheets of the metal die-stamped to form the two halves, or the two faces of the temple piece. A circuit board is made to fit into the space between the faces. Then, two die-cut pieces of insulator material (e.g., dielectric tape) can cover the top and the bottom surfaces of the circuit board. The board is then sandwiched between the faces to form the temple. In one example, the dielectric tape can be double-sided sticky tape, with one side sticking to the circuit board, and the other side sticking to the temple. An adhesive can be used to glue the two faces of the temple piece together.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

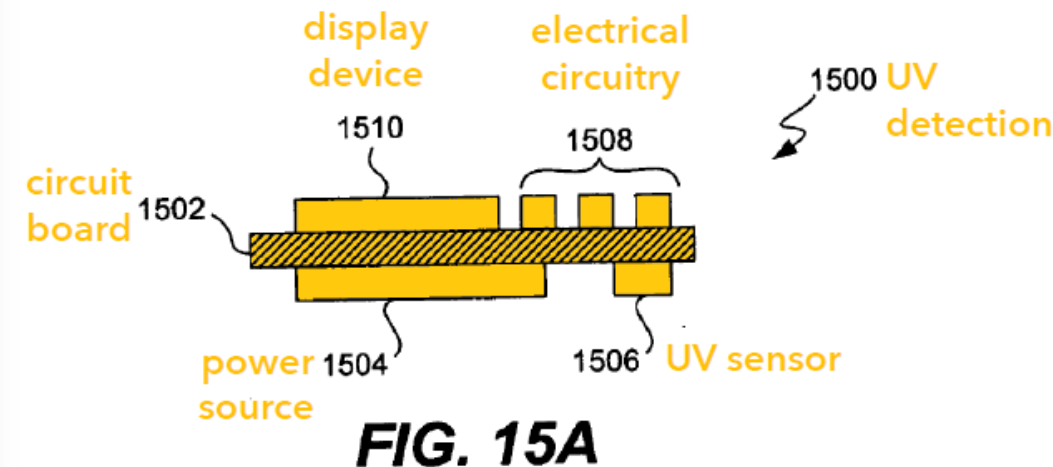
Ground 1 (Claim 12)

PO Argument	Petitioner's Response
EX-1006, [0053]; EX-2014 ¶¶61-64. Petitioner does not explain how or why a POSITA would have encapsulated the UV detection system of Howell-596 at all, let alone doing so without interfering with the UV detection system's various components that need direct access to the external environment and therefore cannot be "encapsulated." See Section V(A)(1), <i>supra</i>. Further, because Howell-596	As with claim 1, Patent Owner contends that the Petition's combination would unnecessarily "encapsulate" Howell-596's UV sensor, impairing its functionality. POR, 28-29. This contention is incorrect for the reasons explained above. See <i>supra</i> §II.A. Moreover, the Petition's rationale for combining the references does not depend on Howell-158's insulating layer encapsulating the sensor. Pet., 23, 34; see also Ex.1002, ¶66.
POR, at 28	Pet. Reply at 14
Patent Owner notes that an insulating layer "encapsulating" the entire UV detection system of Howell-596 would have destroyed Howell-596's functionality	<u>No substantive response from Petitioner</u>

Ground 1 (Claim 12)

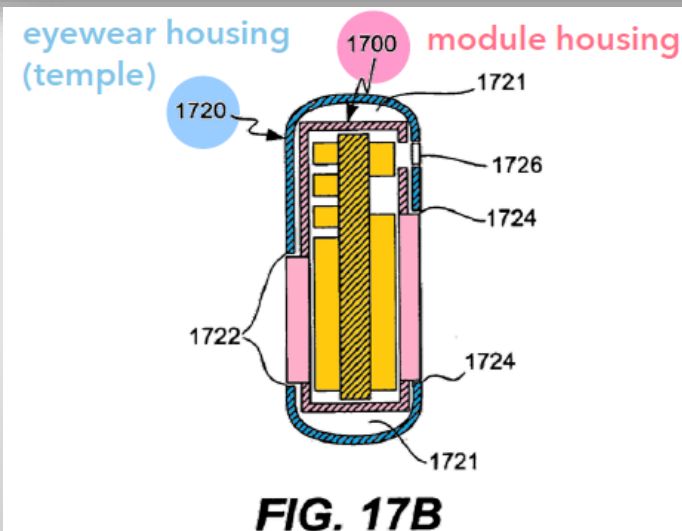
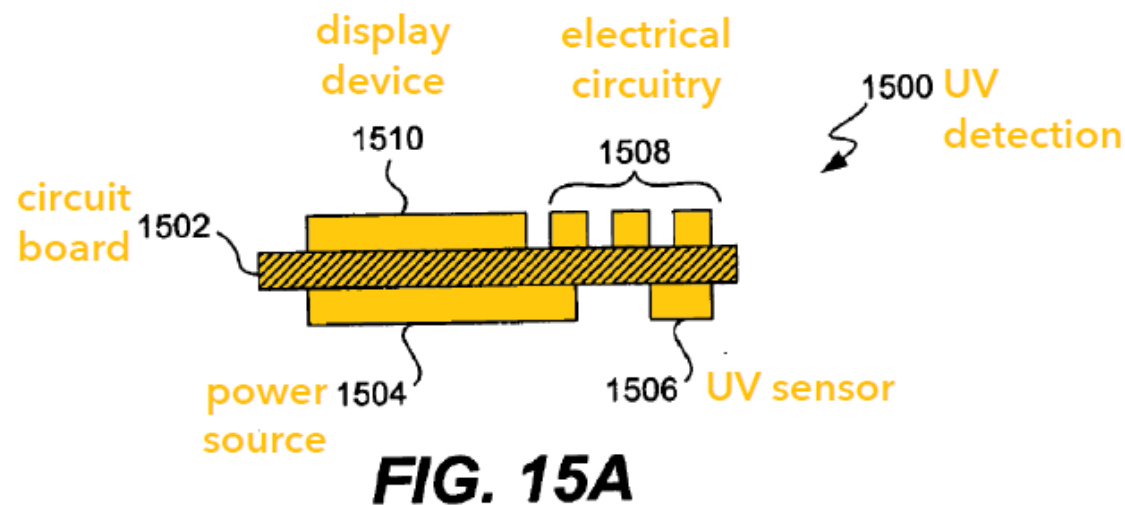
Howell-158 discloses an insulating layer (electronics module). Ex. 1006 ¶53.

The insulating layer qualifies as the claimed electronics module including because it “encapsulate[s] the electrical components” to provide both insulation and “mechanical stiffness.” Ex. 1006 ¶53; Ex. 1001, 7:45-51 (’541 patent stating “an ‘electronics module’ may refer to a housing or container that comprises a plurality of electrical components”). Thus, claim 12 would have been obvious in view of Howell-596 and Howell-158. Ex. 1002 ¶103.



Howell-158 confirms that its insulating layer can function as a housing or container by providing encapsulation, insulation, and mechanical stiffness. Ex.1006, [0053]. Thus, it satisfies both the claimed “insulating layer” and “electronics module.” *See* Pet., 33-34.

Ground 1 (Claim 12)



[0053] For glasses with metallic frames, to prevent circuits from being shorted or to reduce leakage current, one embodiment provides an insulating layer between the electrical components or circuit board and the metallic frames.

One example of an insulating layer is a tape to encapsulate the electrical components. The tape is non-conducting so as to provide insulation and, to a certain degree, can also provide mechanical stiffness. One way to make such temples is to have two sheets of the metal die-stamped to form the two halves, or the two faces of the temple piece. A circuit board is made to fit into the space between the faces. Then, two die-cut pieces of insulator material (e.g., dielectric tape) can cover the top and the bottom surfaces of the circuit board. The board is then sandwiched between the faces to form the temple. In one example, the dielectric tape can be double-sided sticky tape, with one side sticking to the circuit board, and the other side sticking to the temple. An adhesive can be used to glue the two faces of the temple piece together.

Issue 1: Insulating Layer (Claims 1-18)

Ground 1

The Claimed “Insulating Layer”

Ground(s)	Prior Art
1	Howell-596, Howell-158
2	Howell-596, Howell-158, Hattori-913
3	Howell-596
4	Howell-596, Hattori-913
5	Kokonaski-166, Howell-158
6	Kokonaski-999, Howell-158

'541 Patent, Claim 1

1. A first device, comprising:

a frame comprising a first temple and a second temple, wherein the frame comprises a housing module coupled to a structural member;

a first lens and a second lens coupled to the frame; and

an electronics module, wherein the electronics module is located within the housing module;

wherein the electronics module comprises at least any two of: a power source; a controller; and a sensing mechanism; and

wherein an insulating layer is disposed between one or more electronic components located within the electronics module and the frame of the first device.

Wearable Electronics – State of the Art



US 20080273166A1

(19) **United States**
(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0273166 A1**
(43) **Pub. Date: Nov. 6, 2008**

(54) **ELECTRONIC EYEGLASS FRAME**

(76) **Inventors:** William Kokonaski, Gig Harbor, WA (US); Ronald D. Blum, Roanoke, VA (US); Tiziano Tabacchi, Pieve di Cadore (IT); Martin Boch, Kieselbronn (DE); Massimo Pinazza, Pieve di Cadore (IT); Scott N. Richman, Irvine, CA (US); Volkan Orguz, Aliso Viejo, CA (US); Joshua N. Haddock, Roanoke, VA (US)

Correspondence Address:
PEARL, COHEN, ZEDEK & LATZER, LLP
1500 BROADWAY, 12TH FLOOR
NEW YORK, NY 10036 (US)

(21) Appl. No.: 12/054,299
(22) Filed: Mar. 24, 2008

Related U.S. Application Data

(60) Provisional application No. 60/924,225, filed on May 4, 2007, provisional application No. 60/929,419, filed on Jun. 26, 2007.

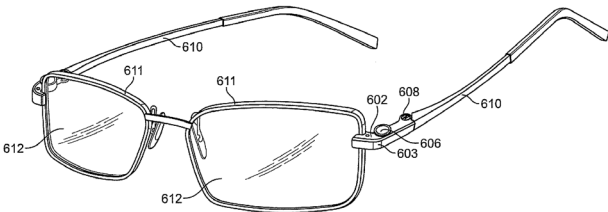
Publication Classification

(51) **Int. Cl.**
G02C 7/06 (2006.01)
G02C 11/00 (2006.01)

(52) **U.S. Cl.** 351/158; 351/168

(57) **ABSTRACT**

The present invention generally relates to integrating electronic components into an electro-active frame for driving electro-active focusing lenses. This is accomplished in a cosmetically pleasing manner that allows a platform of frame systems to be built from a single electronic module. Specifically, the present invention discloses controlling an electro-active lens in a deliberate, hands free manner that gives the user control of the electro-active lens.



(57)

ABSTRACT

The present invention generally relates to integrating electronic components into an electro-active frame for driving electro-active focusing lenses. This is accomplished in a cosmetically pleasing manner that allows a platform of frame systems to be built from a single electronic module. Specifically, the present invention discloses controlling an electro-active lens in a deliberate, hands free manner that gives the user control of the electro-active lens.

Wearable Electronics – State of the Art

Electronic Eyewear struggled to gain user acceptance due to the lack of aesthetics and awkward feel on users' faces

The focus of *wearIT@work* is on applications and solutions with impact on productivity as achieved by the VuMan [Smailagic, Siewiorek, Martin, Stivoric, 2001] or with economic importance like the WSS 1000 [Stein et al 1998]. A mayor draw back in past developments in wearable computing was just the fact that these developments lacked user acceptance. Therefore the project follows the successfully in wearable computing applied user centred design approach based on rapid prototyping [Siewiorek, Smailagic, Salber, 2001].

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Wearable Electronics – State of the Art

Of all the different types of technology, wearable tech seems to be especially prone to failure. With Thump, the brand Oakley claimed to have created a new product category they called “digital music eyewear.” Thump was a pair of sunglasses with a built-in MP3 music player, and its advanced design allowed the shades to flip up for use indoors. Reviewers were impressed with the sound quality but not much else. Besides being ridiculously expensive at \$500, they were hideously ugly.

The very idea behind the Thump's design is ingenious, but the execution is mixed. For starters, we were pleased to find that we could wear them over regular eyeglasses, though obviously it felt a little weird. With or without

On the other hand, the Thump's frame has a decidedly plastic feel to it--a concession, no doubt, to the need to make them as light as possible (and at 1.8 ounces, they're reasonably light), but still a disappointment given the high price tag. Thankfully, Oakley offers colors other than the boring matte black, including Rootbeer, Tortoise, and White Camo. Color choices vary depending on whether you choose the 128MB or 256MB model; the latter has the bonus of polarized lenses.

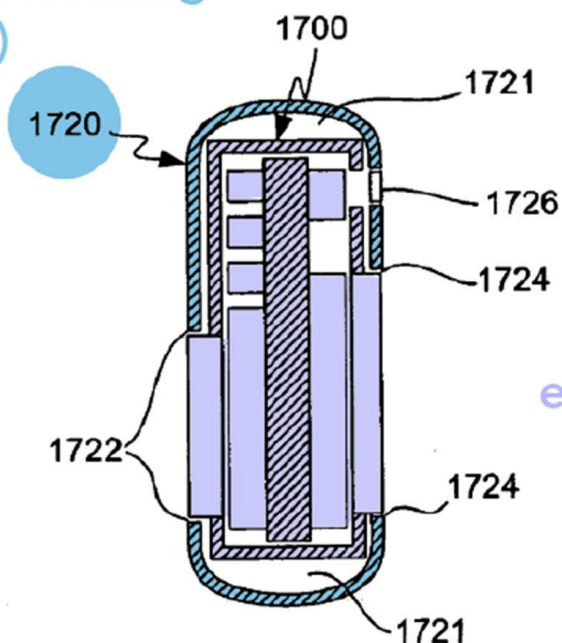
DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

'541 Patent Prosecution History

Kokonaski does not disclose each and every feature recited by independent claim 48, as amended. The Office attempts to rely on the theory that the features are "implicitly" disclosed, suggesting that "the wires *can have* insulating material." So the Office acknowledges this is merely one "possibility", which is insufficient to satisfy the standard quoted above. The Office does not show that the missing feature is "necessarily present", as required. Indeed, there are other ways in which Kokonaski could prevent a short circuit. For example, if the frame is not electrically conductive, the components of the electronics module could contact the frame without creating a short circuit. Thus, Kokonaski does not require the claimed elements.

Howell-596 (Grounds 1-4)

eyewear housing
(temple)



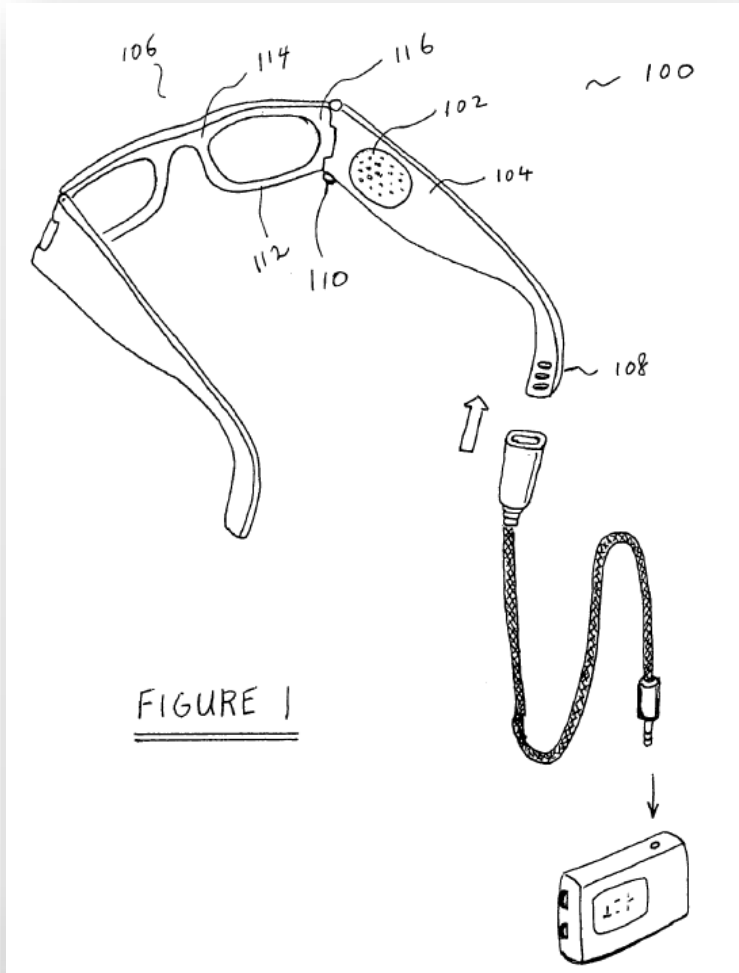
electronics module

FIG. 17B

Howell-596 also discloses that the UV detection system could include even more components, such as an optical filter (*id.* at ¶[0078]), additional sensors (e.g., a thermal sensor, motion detector, stress sensor, and/or a switch in addition to the photodetector, *id.* at ¶¶[0078], [0080]), communication circuitry (*id.* at ¶[0078]), a circuit board (*id.* at ¶[0073]), a display device (*id.*), a speaker (*id.* at ¶[0078]), a heart monitor (*id.* at ¶[0091]), and tethering components so that all of these components can be integrated in a single pair of glasses without sacrificing the aesthetics and/or wearability of the eyewear that would be inherent in attempting to package all of these components in one device (*id.* at ¶¶[0007], [0070]).

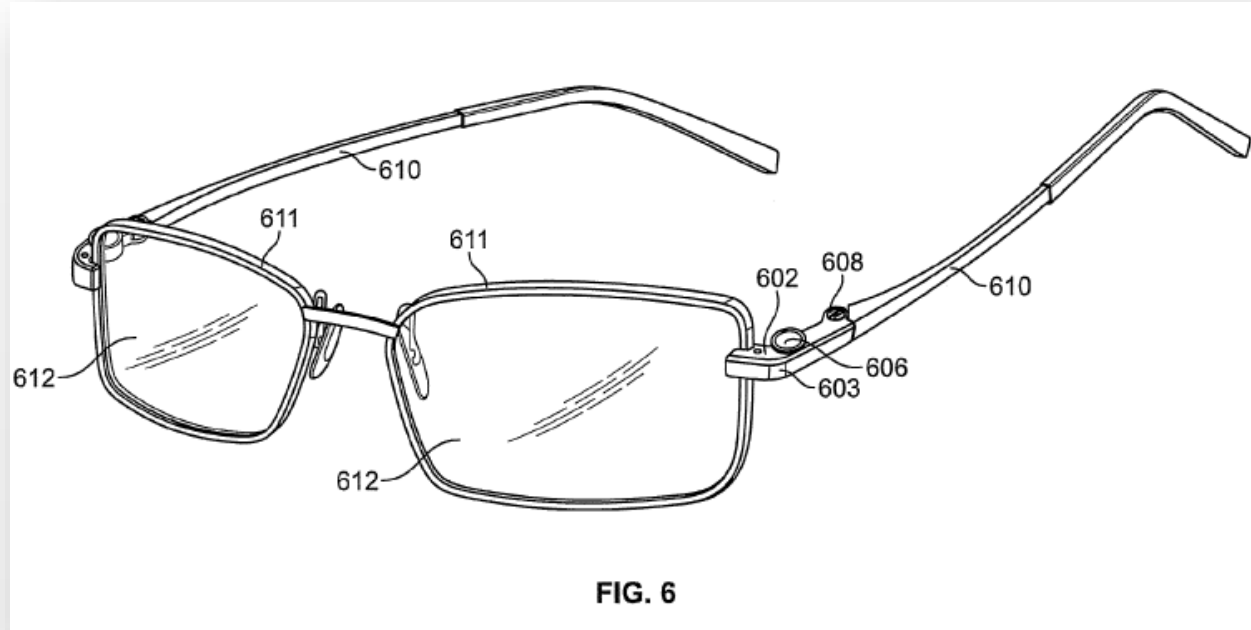
DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Howell-158 (Grounds 1-2, 5-6)



[0053] For glasses with metallic frames, to prevent circuits from being shorted or to reduce leakage current, one embodiment provides an insulating layer between the electrical components or circuit board and the metallic frames.

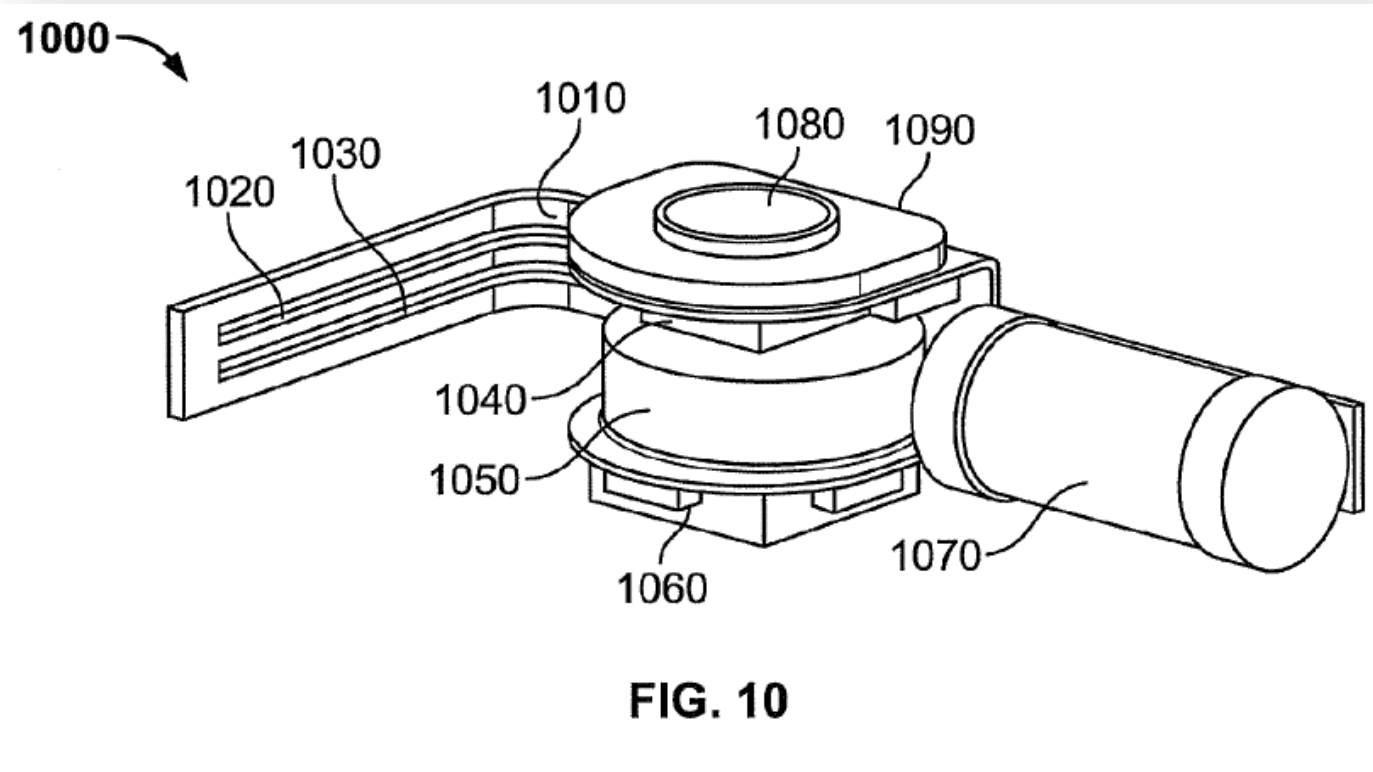
One example of an insulating layer is a tape to encapsulate the electrical components. The tape is non-conducting so as to provide insulation and, to a certain degree, can also provide mechanical stiffness. One way to make such temples is to have two sheets of the metal die-stamped to form the two halves, or the two faces of the temple piece. A circuit board is made to fit into the space between the faces. Then, two die-cut pieces of insulator material (e.g., dielectric tape) can cover the top and the bottom surfaces of the circuit board. The board is then sandwiched between the faces to form the temple. In one example, the dielectric tape can be double-sided sticky tape, with one side sticking to the circuit board, and the other side sticking to the temple. An adhesive can be used to glue the two faces of the temple piece together.



(57)

ABSTRACT

The present invention generally relates to integrating electronic components into an electro-active frame for driving electro-active focusing lenses. This is accomplished in a **cosmetically pleasing manner** that allows a platform of frame systems to be built from a single electronic module. Specifically, the present invention discloses controlling an electro-active lens in a deliberate, hands free manner that gives the user control of the electro-active lens.

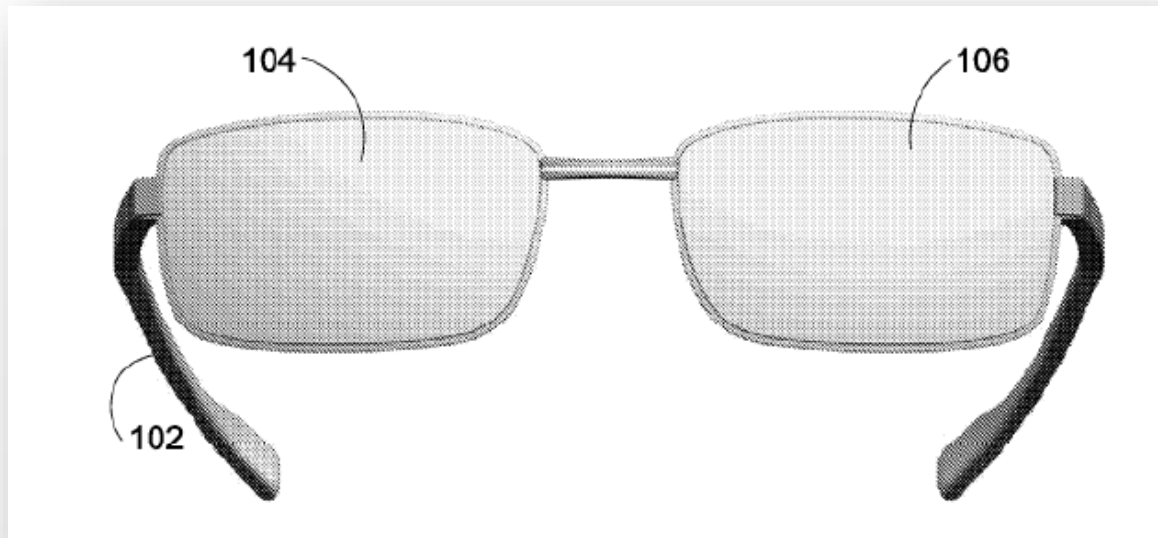


[0087] FIG. 10 illustrates an electronic module 1000 of another embodiment of the present invention. The module includes a flex circuit 1010 with two conductive buses 1020 and 1030 for making electrical contact to the front surface of an electro-active lens. The module includes a drive circuit 1040 placed above a rechargeable battery 1050. Below the battery is a recharging coil 1060. The charging coil is used to inductively recharge the battery without direct contact. In this way, the module may be hermetically sealed while still allowing the battery to be recharged without breaking a moisture resistant seal. A tilt sensor 1070 is also attached to the electronic module. A manual switch 1080 is attached to the top of the electronic module and is integrated with a sealing diaphragm 1090. This module is sealed with an epoxy, silicone, or similar water resistant material to prevent water from contacting the electronic components. This module is shaped to fit into a universal frame electronic component as illustrated in FIG. 11.

[0084] FIG. 9A illustrates a top view of a electro-active spectacle lenses and rimmed frame. The rimmed frame can be made of zyle, metal, or any combination thereof. Both right front spatial void 910 and left frame front spatial void 920 is shown. Within either or both of these voids, a module may be placed. As particularly shown in FIG. 9A, modules 930 and 940 are placed on the frame and attached to the frame stems 970 and 980 with temple screws 950 and 960. The modules are then connected to the eye wires 994 and 995 and are connected to the nose bridge 930. The eye wires support the electro-active lenses 996 and 998.

[0087] FIG. 10 illustrates an electronic module 1000 of another embodiment of the present invention. The module includes a flex circuit 1010 with two conductive buses 1020 and 1030 for making electrical contact to the front surface of an electro-active lens. The module includes a drive circuit 1040 placed above a rechargeable battery 1050. Below the battery is a recharging coil 1060. The charging coil is used to inductively recharge the battery without direct contact. In this way, the module may be hermetically sealed while still allowing the battery to be recharged without breaking a moisture resistant seal. A tilt sensor 1070 is also attached to the electronic module. A manual switch 1080 is attached to the top of the electronic module and is integrated with a sealing diaphragm 1090. This module is sealed with an epoxy, silicone, or similar water resistant material to prevent water from contacting the electronic components. This module is shaped to fit into a universal frame electronic component as illustrated in FIG. 11.

Kokonaski-999 (Ground 6)



electronic module and operation of the second electro-active lens 106 can be governed by a second electronic module. Under this scenario, the first and second electronic modules can communicate using one or more conductive wires (e.g., embedded within a portion of the frame 102), one or more conductive portions of the frame 102 (e.g., conductive metal layers or conductive cores encapsulated by non-conductive material), one or more conductive layers of the electro-active lenses 104 and 106, an optical link, and/or via a wireless communications link. Communication between the first and second electronic modules can facilitate coordinated operation of the first and second electro-active lenses 104 and 106.

Petitioner's New Argument in its Reply Brief

Reply Brief, 25

is controlled by a second electronic module. Ex.1009, [0032]. In this configuration, “the first and second electronic modules can communicate using *one or more conductive wires*... **or** one or more conductive portions of the frame 102 (e.g., conductive metal layers or conductive cores encapsulated by non-conductive material)” or one of multiple other options. *Id.* (emphasis added). Patent Owner for functionality.” POR, 44. **But this overlooks the broader disclosure, including the same sentence in Kokonaski-999 that explains “the first and second electronic modules can communicate using one or more conductive wires” or via other options.** Ex.1009, [0032]; *see also id.*, [0079] (describing “using conductive wires positioned

Kokonaski-999's Conductive Paths

of both the first and second electro-active lenses 104 and 106. Alternatively, operation of the first electro-active lens 104 can be governed by a first electronic module and operation of the second electro-active lens 106 can be governed by a second electronic module. Under this scenario, **the first and second electronic modules can communicate using** one or more conductive wires (e.g., embedded within a portion of the frame 102), one or more conductive portions of the frame 102 (e.g., conductive metal layers or

Issue 3: Thickness of the “Housing Module” (Claim 18)

Grounds 1, 3, 5, & 6

18. The first device of claim 1, wherein the housing module has **a thickness that is less than or equal to approximately 0.7 mm**.

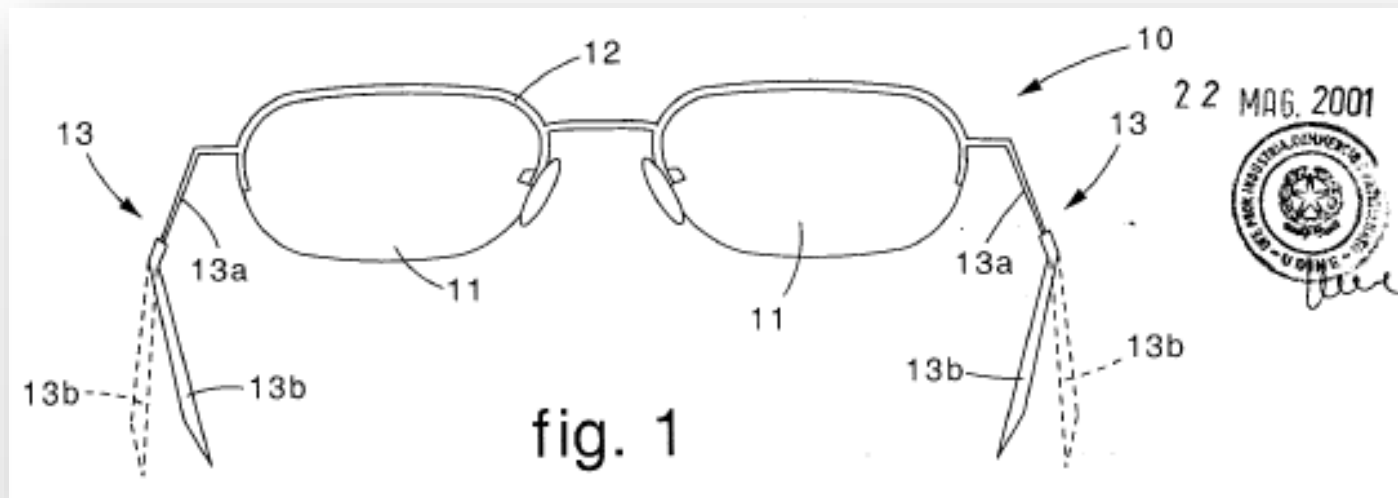
Petitioner's Prior Art (Grounds 1, 3, 5, & 6)

Dudli, Claims 1-2

Claims

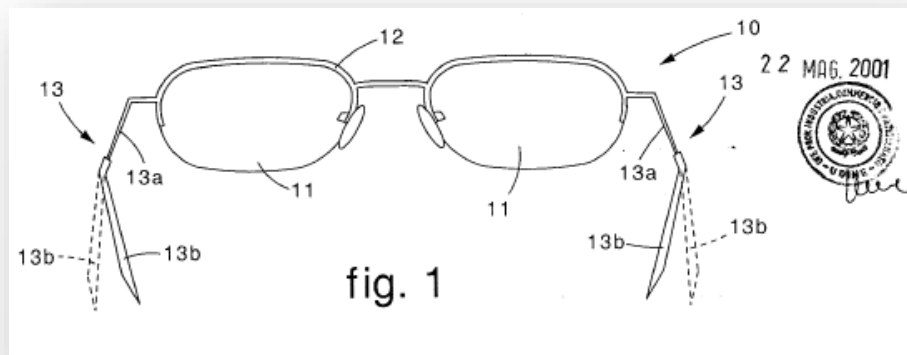
1. Glass temple (2) for a pair of glasses, the temple (2) having a first position and a second position, wherein the curvature (r) of the temple (2) in the first position is roughly opposite to the curvature (r) of the temple (2) in the second position and wherein the temple (2) can be snapped back and forth between the two positions.
2. Glasses temple (2) according to claim 1, **characterized in that** the temple (2) is made of metal, in particular aluminum or spring steel sheet, preferably with a thickness of 0.2 to 0.5 mm.

Della, Fig. 1



'541 Patent, Claim 18

Della, Fig. 1



Dudli, cl. 2

2. Glasses temple (2) according to claim 1, **characterized in that the temple (2) is made of metal, in particular aluminum or spring steel sheet, preferably with a thickness of 0.2 to 0.5 mm.**

Howell-596, FIG. 17B

eyewear housing
(temple)

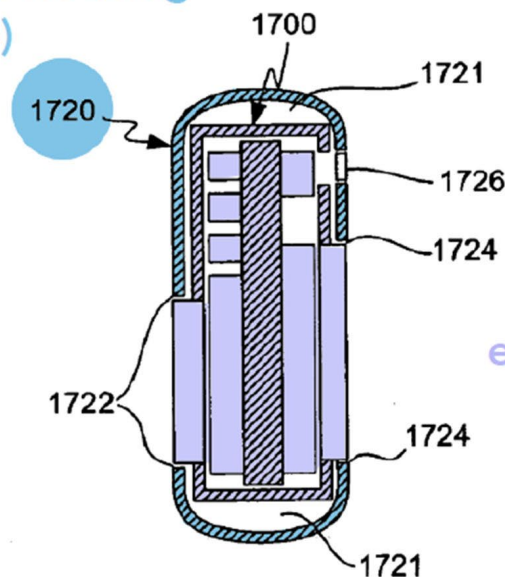


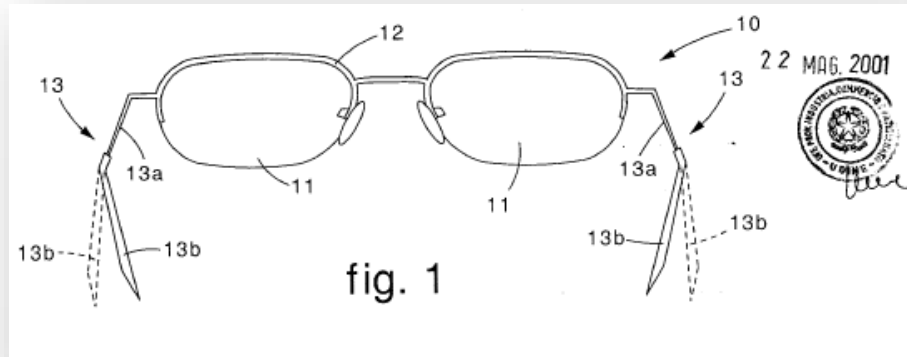
FIG. 17B

electronics module

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

'541 Patent, Claim 18

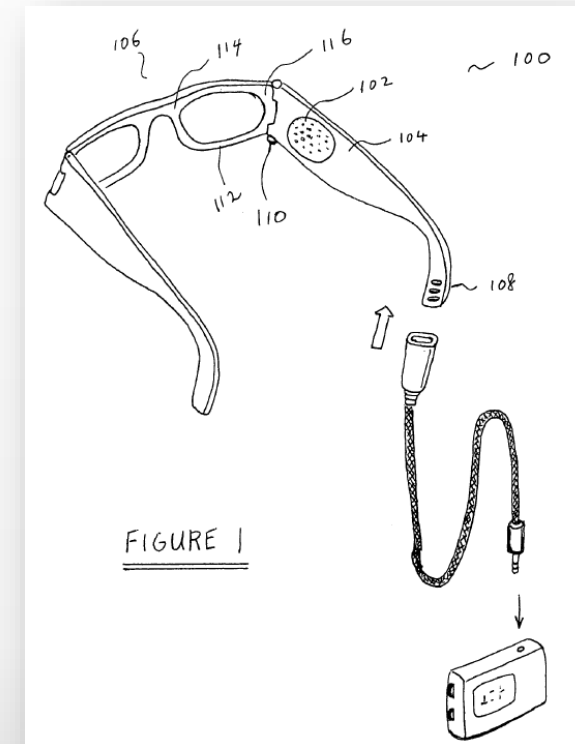
Della, Fig. 1



Dudli, cl. 2

2. Glasses temple (2) according to claim 1, **characterized in that the temple (2) is made of metal, in particular aluminum or spring steel sheet, preferably with a thickness of 0.2 to 0.5 mm.**

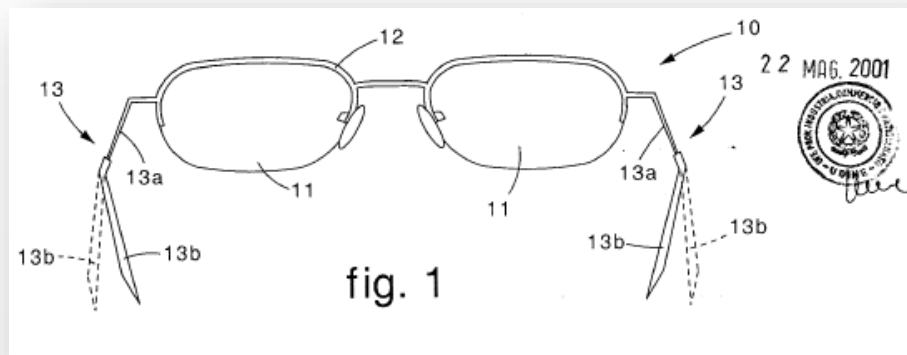
Howell-158, Figure 1



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

'541 Patent, Claim 18

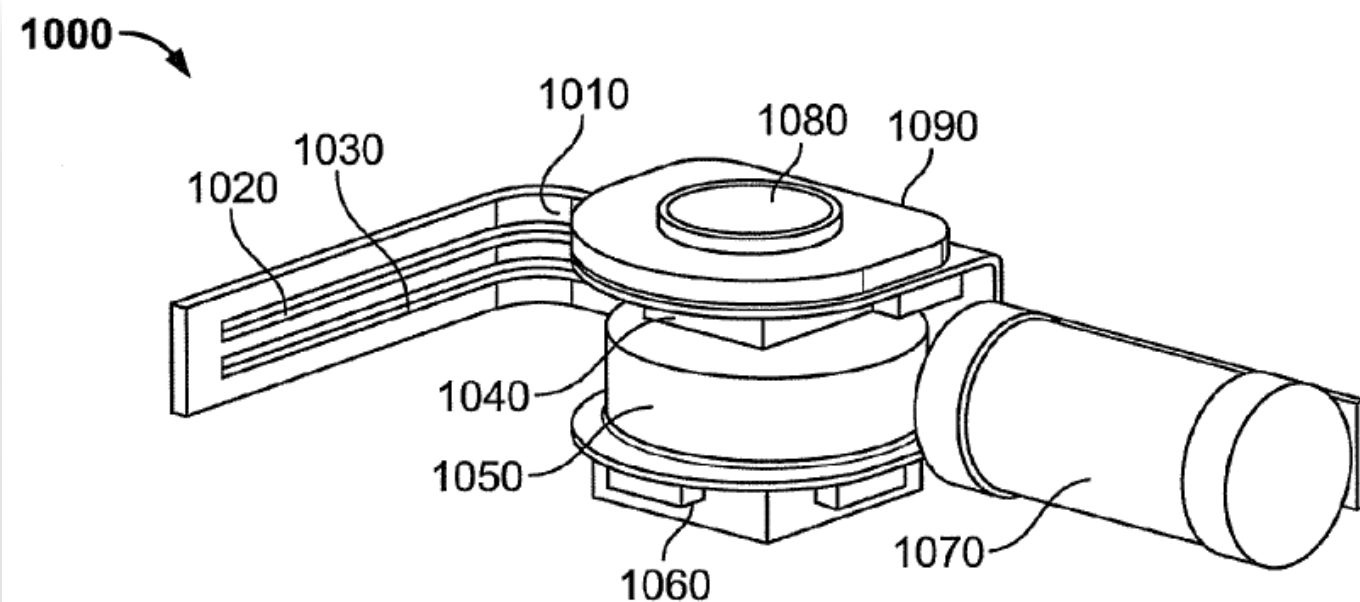
Della, Fig. 1



Dudli, cl. 2

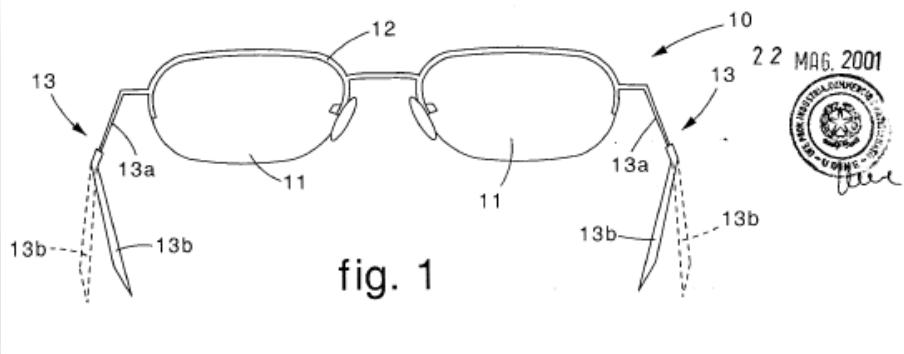
2. Glasses temple (2) according to claim 1, **characterized in that** the temple (2) is made of metal, in particular aluminum or spring steel sheet, preferably with a thickness of 0.2 to 0.5 mm.

Kokonaski-166, FIG. 10



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Della, Fig. 1



Dudli, cl. 2

2. Glasses temple (2) according to claim 1, characterized in that the temple (2) is made of metal, in particular aluminum or spring steel sheet, preferably with a thickness of 0.2 to 0.5 mm.

Kokonaski-999, FIG.

