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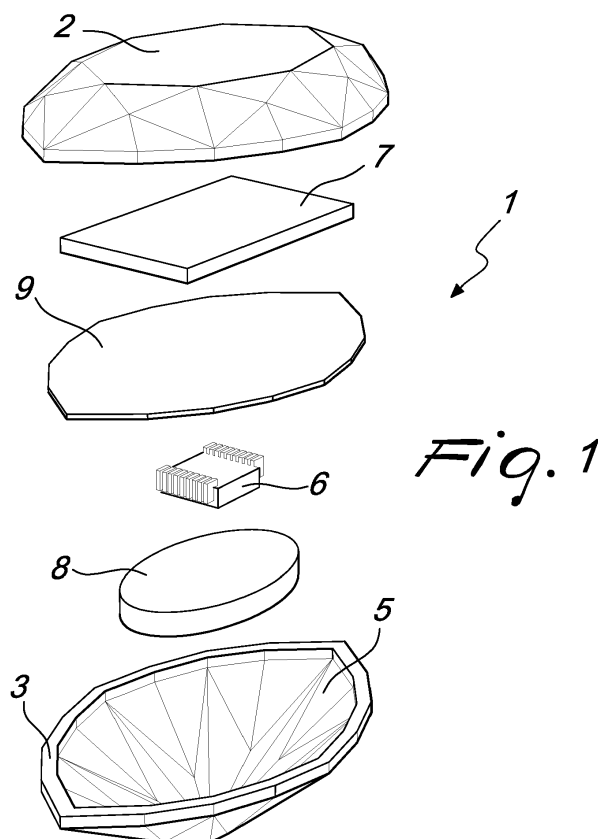
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(54) **GEM**

(57) A gem (1) comprising a pair of shell parts (2, 3) that can be mutually coupled so as to form a shell (4); the shell (4) comprises an internal cavity (5) that accommodates at least one processor (6) that controls at least one display (7), which is directed toward the outside of

a respective shell part (2, 3), and at least one electric charge storage device (8); at least one shell part (2, 3) is made of a material selected preferably from natural materials, synthetic materials, imitation materials, and the like.



Description

[0001] The present invention relates to a gem.

[0002] The term "gems" can include a set of materials of different origin (predominantly minerals) which, owing to their brilliance, color, transparency and rarity, acquire a high economic and emotional value.

[0003] Mineral gems can generally be processed by cutting or polishing in order to enhance their characterizing qualities. Generally speaking, for an equal rarity, the preciousness of gems is determined by their purity and color.

[0004] Ivory, coral and pearls, which are of animal origin, as well as amber and jet, which are of vegetable origin, are also considered gems.

[0005] Depending on the optical and color characteristics and on the hardness of the material, it is possible to provide cuts with flat faces (cuts proper), or processing with curved, smooth and convex surfaces.

[0006] Generally, it is known to resort to highly sophisticated cuts and processing in order to modify the optical effects produced by a single gem in relation to its specific indices of light reflection and refraction, in order to vary its brilliance and make their color shift.

[0007] Specific optical effects can also be obtained by mutually coupling different gems and arranging them on a jewel so that light passes through both, undergoing a respective filtration before exiting from them.

[0008] In any case, each gem, once processed, has precisely and uniquely identifiable characteristics.

[0009] Currently it is not possible to have gems that can modify the optical effects that they produce once they have been completely processed and/or incorporated in a respective jewel.

[0010] This characteristic is instead extremely interesting in order to give greater versatility and originality to jewels.

[0011] The aim of the present invention is to solve the problems described above, by proposing a gem that allows variations of the optical effects that it produces with respect to an observer.

[0012] Within this aim, an object of the invention is to propose a gem that allows variations of its own color.

[0013] Another object of the present invention is to propose a gem that can emit a multicolored luminous radiation of variable intensity and frequency.

[0014] A further object of the present invention is to provide a gem that has modest costs, is relatively simple to provide in practice and is safe in application.

[0015] This aim and these and other objects that will become better apparent hereinafter are achieved by a gem, characterized in that it comprises a pair of shell parts that can be mutually coupled so as to form a shell, said shell comprising an internal cavity that accommodates at least one processor that controls at least one display, which is directed toward the outside of a respective shell part, and at least one electric charge storage device, at least one shell part being made of a material

selected preferably from natural materials, synthetic materials, imitation materials, and the like.

[0016] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the gem according to the invention, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is an exploded perspective view of a particular embodiment of a gem according to the invention;

Figure 2 is an open perspective view of the gem of Figure 1;

Figure 3 is a perspective view of the gem of Figure 1;

Figure 4 is a perspective view of a further embodiment of a gem according to the invention;

Figure 5 is a perspective view of a further embodiment of a gem according to the invention;

Figure 6 is a perspective view of a further embodiment of a gem according to the invention;

Figure 7 is a perspective view of a further embodiment of a gem according to the invention.

[0017] With particular reference to the figures, the reference numeral 1 generally designates a gem according to the invention.

[0018] The gem 1 according to the invention comprises positively a pair of shell parts 2 and 3, which can be mutually coupled so as to form a shell 4.

[0019] According to one possible embodiment, the shell 4 can have the overall external appearance of the type of a traditional gem. In any case, the execution of embodiments in which the shell 4 has a different shape is not excluded: for example, it is possible to provide fancy shapes or reproductions of geometric, natural and/or other shapes.

[0020] At least one first shell part 2 is made of a material of the type selected preferably from natural materials, synthetic materials, imitation materials, and the like.

[0021] Natural materials include (merely by way of example, without this defining any limitation to the field of application of the present invention) diamonds, corundums, beryls, quartzes, tourmalines, and the like. Among synthetic materials it is instead appropriate to mention (by way of nonlimiting example), corundum, synthetic spinel, sapphire glass, cubic zirconia, transparent ceramic and the like.

[0022] Finally, again merely by way of example without the introduction of any limitation to the field of application of the present invention, it is specified that the imitation materials can comprise glass, polymeric materials, composite materials, and the like.

[0023] In principle, at least one of the shell parts 2, 3 might also be made of any one of the materials of the following list: diamond, sapphire, ruby, beryl, amethyst, quartz, emerald, alabaster, aquamarine, adularia, chrysoberyl, rock crystal, chrysoprase, jade, garnet, cordierite, lapis lazuli, opal, spinel, tanzanite, topaz, tourmaline,

tasavorite, turquoise, obsidian, amber, moldavite, ivory, coral, pearl, jet, and the like.

[0024] As will become better apparent hereinafter (in relation to the additional explanations provided), the present invention is particularly suited for embodiments in which the material used for at least one of the shell parts 2 and 3 is transparent or partially transparent. Although the adoption of opaque materials is not excluded, therefore, it is specified that the best applications of the present invention refer to the adoption of materials for at least one of the shell parts 2, 3 that allow the transmission of light through them.

[0025] It is not excluded, in any case, to provide also the second shell part 3 with the same material with which the first shell part 2 has been made, or to couple a first shell part 2 made of one of the materials that are present in the list above with a second shell part 3 made of a different material, optionally even not belonging to the list given above.

[0026] It is not excluded, in fact, to provide the second shell part 3 with polymeric, metallic, composite, ceramic materials and/or combinations thereof with each other and/or with the materials that can be used for the first shell part 2.

[0027] The shell 4 comprises an internal cavity 5 within which at least one processor 6 is accommodated which controls at least one display 7, which is directed outward with reference to the respective shell part 2 and/or 3 that contains it, and at least one electric charge storage device 8.

[0028] Essentially, the electric charge storage device 8 is an actual rechargeable battery of the miniaturized type.

[0029] It is possible to interpose validly between the display 7 and the processor 6 at least one partition 9 of the type preferably selected from a base for printed circuits (of the type known as printed circuit board), a transparent plate, a translucent lamina, an opaque plate, and the like.

[0030] It is not excluded that the partition 9 might be made of a metal plate.

[0031] So-called printed circuit boards (PCB) are generally made of materials such as Vetronite (a composite material based on glass fiber with dielectric properties).

[0032] With particular reference to an embodiment of unquestionable interest in practice and in application, the display 7 can conveniently be constituted by a liquid crystal screen.

[0033] Among liquid crystal screens it is appropriate to specify the unquestionable interest for some types of screen that are currently in use, such as LED screens and screens of the type known as OLED. In any case, resorting to liquid crystal screens of a different technology is not excluded.

[0034] In this case, the processor 6 is designed to control and manage the liquid crystal screen and in particular controls its polarization criteria, in order to condition the beam of light emitted by the display 7.

[0035] It is specified that, with particular reference to an embodiment that is simple to use and convenient to manage, the gem 1 advantageously can comprise a receiving unit, which is coupled electrically to the processor 6 and to the electric charge storage device 8, for inductive connection to an external induction battery charger.

[0036] In practice, the receiving unit can be simply constituted by a plurality of turns of conducting material which, exposed to the magnetic field that is variable over time and is induced by an induction battery charger (of a substantially known type), they are subject to the circulation of an (induced) electric current, which can recharge the storage device 8.

[0037] It is appropriate to specify that at least one of the shell parts 2, 3 (with particular reference to the embodiment shown in the accompanying figures, preferably the second shell part 3) comprises at least one accommodation hole for a connector that is connected to the processor 6 and to the electric charge storage device 8.

[0038] This connector conveniently can be coupled to the terminal of an external battery charger (which in turn is connected to the electric grid or to another power source).

[0039] It has thus been shown that the gem 1 according to the invention, in different constructive variations thereof, can be supplied with power by means of an induction or wired power supply device.

[0040] It is specified that in the second case the cable can also be used to transfer data strings from a computer, managed by the user, to the gem 1, in order to program, control and adjust the brightness variations of the display 7.

[0041] It is also provided that, in order to increase convenience in use and adjustment, control and programming of the brightness variations of the display 7 of the gem 1, such gem can efficiently comprise a transceiver module, of the type selected preferably from Bluetooth®, wireless, near field contactless, infrared, and the like, for the remote control and adjustment of the light beam emitted by the display 7, in particular the intensity, color, color combination, frequency thereof and their variation over time.

[0042] It is evident that this opportunity for remote control is extremely useful, since it allows the user to perform all the desired adjustments without providing any wired connection and, even more validly, at any time (for example by using his/her own smartphone by connecting it to the gem 1 according to one of the methods listed above).

[0043] A further constructive possibility, which provides for the presence on the gem 1 of at least one sensor, of the type selected preferably from thermal, pressure, relative humidity, lighting, user physiological parameters, which at least partially faces outward, is equally interesting.

[0044] The sensor detects the parameter (or parameters for which it is designed) and transmits/transfers them to the processor 6 in the form of an electrical signal.

[0045] As a consequence, the processor 6 provides a variation of at least one corresponding parameter of the beam emitted by the display 7 according to a dependency rule stored in the processor 6.

[0046] By way of example, it is possible to provide variations in the intensity of the emitted beam (of brightness of the display 7) upon variations in temperature or ambient lighting; likewise, it would also be possible to provide variations in the color of the display 7 upon variations of the body temperature of the user.

[0047] The examples given are only some of the countless modes for control of the display 7 by using the parameters detected by the at least one sensor as a control signal.

[0048] The protective scope of the present invention also extends to a jewel, of the type preferably chosen among an earring, a ring, a brooch, a bracelet, a necklace, a pendant, a tiara, a watch, a buckle, a button and the like.

[0049] Obviously, the jewel might also be of a different type, with particular reference to jewels intended for decorating objects and not suitable to be worn.

[0050] In any case, the jewel according to the invention comprises validly a frame for accommodating at least one gem 1 that is provided with a pair of shell parts 2, 3 which can be mutually coupled so as to form a shell 4.

[0051] As already described previously, the shell 4 might also have an overall external appearance of the type of a traditional gem; at the same time, the provision of shells 4 with fancy shapes and dimensions is provided.

[0052] The shell 4 comprises an internal cavity 5 which accommodates at least one processor 6 which controls at least one display 7, which is directed toward the outside of the shell part 2, 3 that accommodates it, and at least one electric charge storage device 8.

[0053] At least one of the shell parts 2, 3 can be made of a precious material.

[0054] In any case, the adoption of non-precious materials (such as for example polymers and/or composite materials) is not excluded.

[0055] It is specified that the frame of the jewel according to the invention can comprise advantageously at least one respective accommodation channel for conducting elements of the type of terminal ends of sensors, cables for connection to a recharging connector, and the like.

[0056] These conducting elements lead to the processor 6 and allow operations for adjustment, control, programming and recharging of the at least one gem 1 that is mounted in the jewel according to the invention.

[0057] Finally, it should be specified that the jewel according to the invention can advantageously comprise a transceiver module for the remote control and adjustment of the light beam emitted by the display 7.

[0058] This transceiver module is remotely connectable to a control device of the type of a computer, a mobile telephone, a smartphone, a tablet, a smartwatch, a smart band, smart glasses, a smart TV, a remote control, a transponder, and the like.

[0059] In this way, the user of the jewel can control and program his/her own jewel by means of his/her own control device in a simple manner.

[0060] It is therefore evident that the gem 1 and the jewel according to the invention give assurance to the user of the possibility to adjust the brilliance, color, transparency perception of at least one shell part 2 or 3, optionally also providing a continuous variation of these values over time.

[0061] The possibility is provided to record data related to images and/or videos in the processor 6 in order to allow their viewing by transparency through the respective shell part 2 or 3.

[0062] The surface of each shell part 2 or 3 might be completely or partially transparent, although it is not excluded, by means of external processes such as polishing, satin finishing and the like, to generate optical filtering effects that can enhance the light stream emitted by the display 7.

[0063] Positively, the present invention solves the problems described previously, proposing a gem 1 that allows variations of the optical effects produced with respect to an observer.

[0064] Conveniently, the gem 1 according to the invention allows in particular variations of its own color.

[0065] Advantageously, the gem 1 according to the invention may further emit multicolored light of variable intensity and frequency.

[0066] Usefully, the gem 1 can be provided practically in a relatively simple manner and at modest costs: these characteristics make it an innovation of assured application.

[0067] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0068] In particular, the shell 4 can have a shape that is chosen from all the traditional shapes of stones (such as heart, antique, etc.), for example faceted, cabochon; the shell 4 may also have any other fancy shape or a shape aimed at imitating a geometric shape or the shape of any object.

[0069] In the exemplary embodiments shown, individual characteristics, given in relation to specific examples, may actually be interchanged with other different characteristics that exist in other exemplary embodiments.

[0070] In practice, the materials used, as well as the dimensions, may be any according to the requirements and the state of the art.

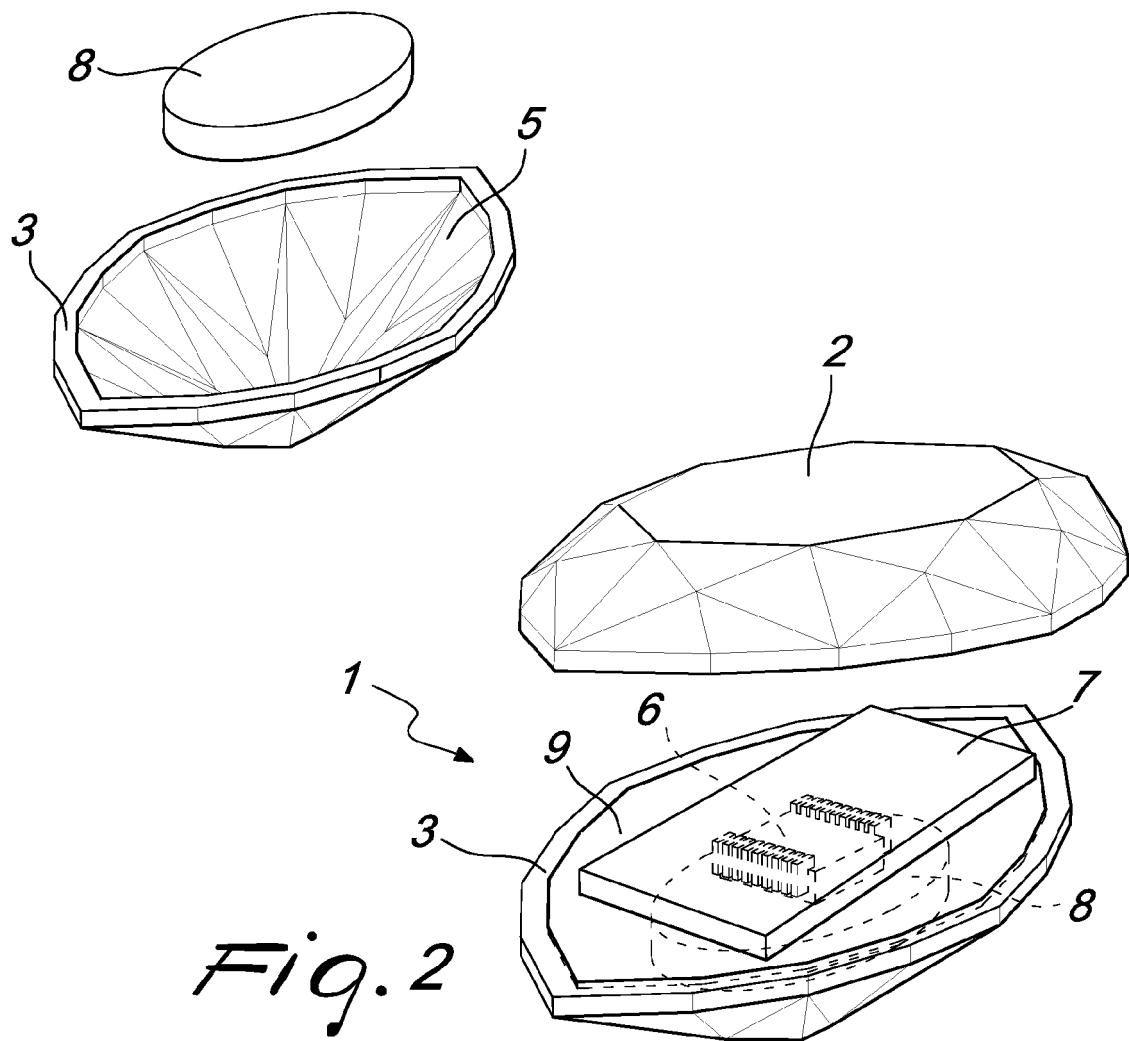
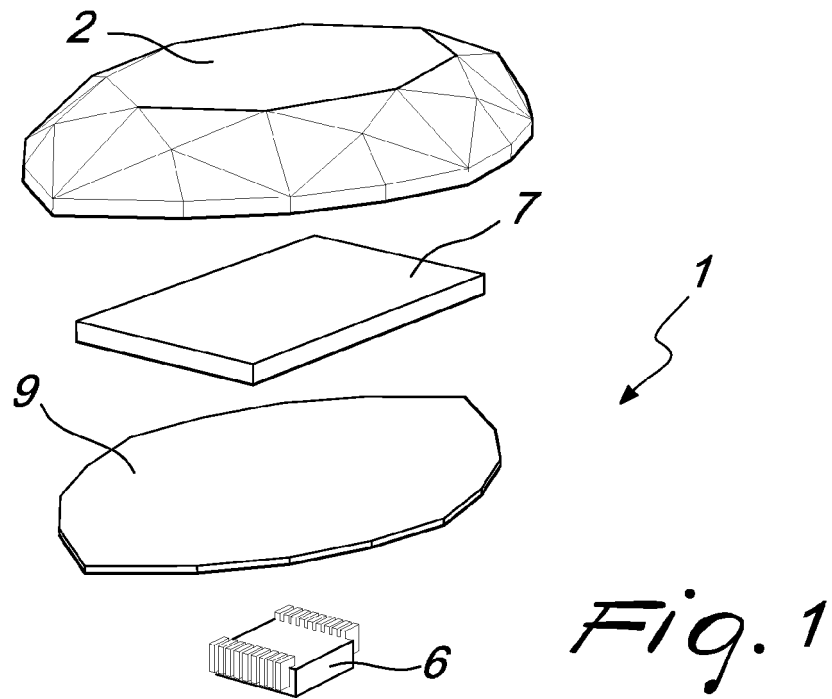
[0071] The disclosures in Italian Patent Application no. 102016000002750 (UB2016A009993), from which this application claims priority, are incorporated herein by reference.

[0072] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such

reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A gem, **characterized in that** it comprises a pair of shell parts (2, 3) that can be mutually coupled so as to form a shell (4), said shell (4) comprising an internal cavity (5) that accommodates at least one processor (6) that controls at least one display (7), which is directed toward the outside of a respective shell part (2, 3), and at least one electric charge storage device (8), at least one shell part (2, 3) being made of a material selected preferably from natural materials, synthetic materials, imitation materials, and the like.
2. A gem according to claim 1, **characterized in that** at least one partition (9) of the type selected preferably from a base for printed circuits, a transparent plate, a translucent lamina, an opaque plate and the like, is interposed between said display (7) and said processor (8).
3. The gem according to claim 1, **characterized in that** said display (7) is constituted preferably by a liquid crystal screen, said processor (6) being preset to control and manage said liquid crystal screen.
4. The gem according to claim 1, **characterized in that** it comprises a receiving unit, which is coupled electrically to said processor (6) and to said electric charge storage device (8), for inductive connection to an external induction battery charger.
5. The gem according to claim 1, **characterized in that** at least one of said shell parts (2, 3) comprises at least one accommodation hole for a connector that is connected to said processor (6) and to said electric charge storage device (8), said connector being connectable to the terminal of an external battery charger.
6. The gem according to claim 1, **characterized in that** it comprises a transceiver module, of the type selected preferably from Bluetooth®, wireless, near field contactless, infrared, and the like, for the remote control and adjustment of the light beam emitted by said display (7), in particular of the intensity, color, color combination, frequency thereof and of their variation over time.
7. The gem according to one or more of the preceding claims, **characterized in that** it comprises at least one sensor, of the type selected preferably from thermal, pressure, relative humidity, lighting, user physiological parameters, that faces at least partially outside, for the transmission to said processor (6) of a signal that corresponds to at least one respective parameter, with consequent variation of at least one related parameter of the beam emitted by said display (7) according to a dependency rule stored in said processor (6).
8. A jewel, of the type selected preferably from an earring, a ring, a brooch, a double brooch, a bracelet, a necklace, a pendant, a tiara, a watch, a buckle, a button and the like, **characterized in that** it comprises an accommodation frame for at least one gem (1) provided with a pair of shell parts (2, 3) that can be mutually coupled so as to form a shell (4), said shell (4) comprising an internal cavity (5) that accommodates at least one processor (6) that controls at least one display (7), which is directed toward the outside of a respective shell part (2, 3), and at least one electric charge storage device (8).
9. The jewel according to the preceding claim, **characterized in that** said frame comprises respective channels for the accommodation of conducting elements such as the terminal ends of sensors, cables for connection to a charging connector and like, said conducting elements leading to said processor (6).
10. The jewel according to claim 8, **characterized in that** it comprises a transceiver module for remote control and adjustment of the light beam emitted by said display (7), said transceiver module being remotely connectable to a control device such as a computer, a mobile telephone, a smartphone, a tablet, a smartwatch, a smart band, smart glasses, a smart TV, a remote control, a transponder, and the like.



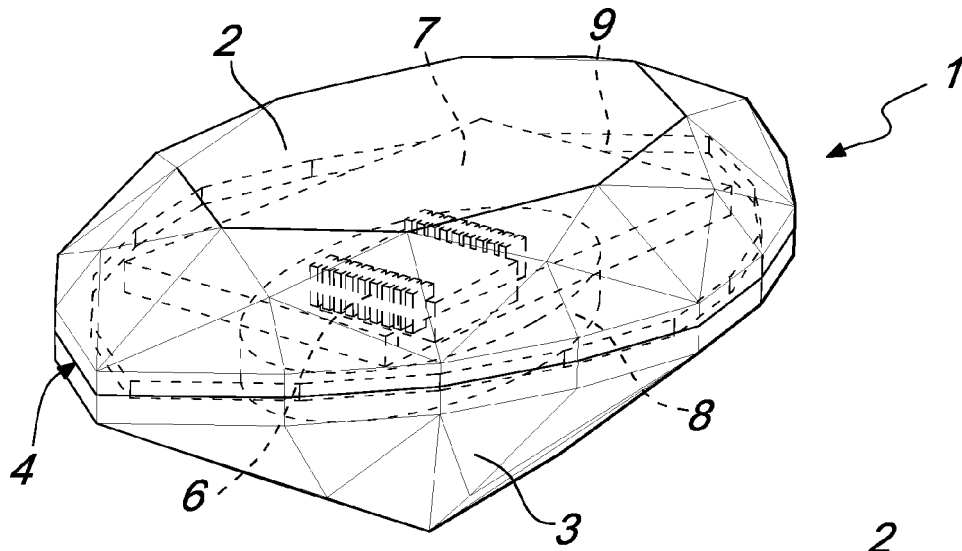


Fig. 3

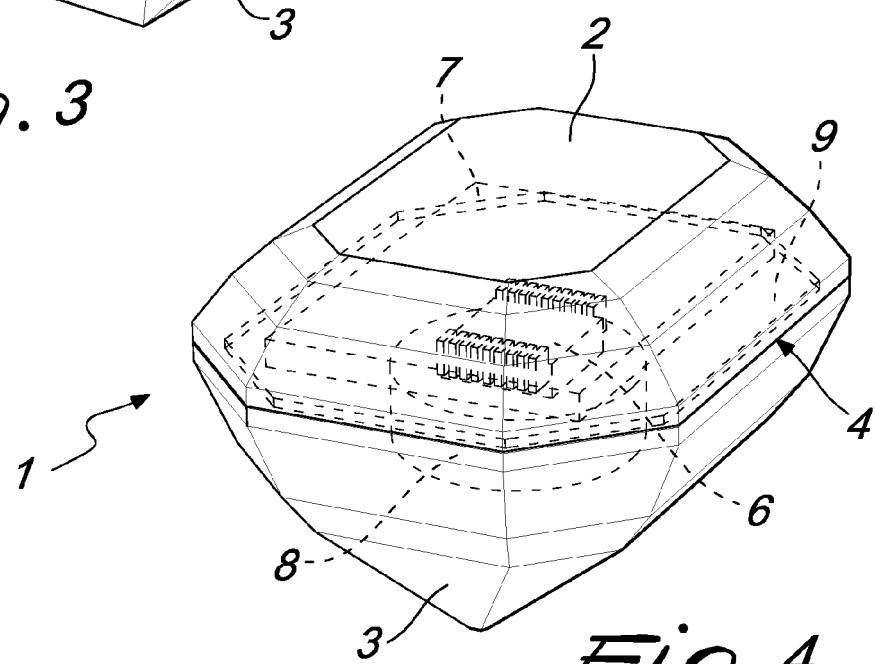


Fig. 4

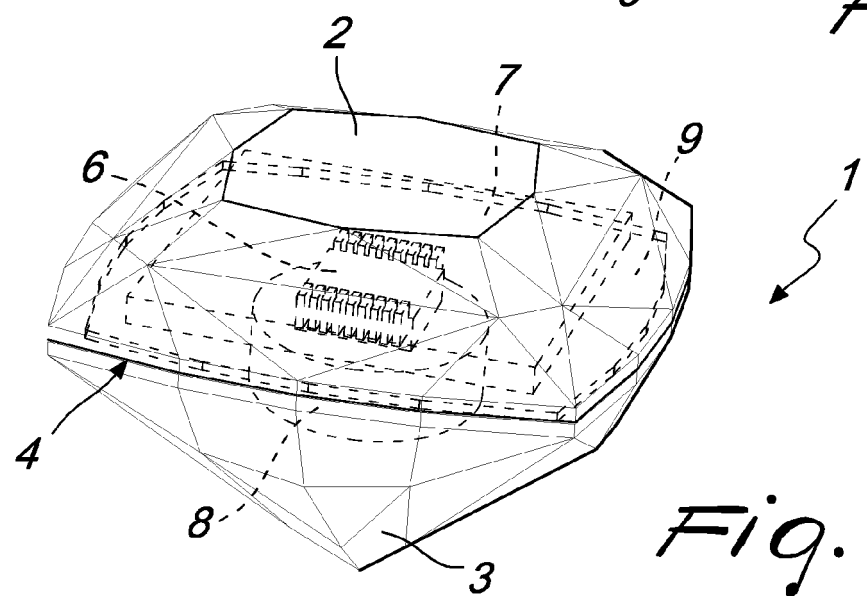
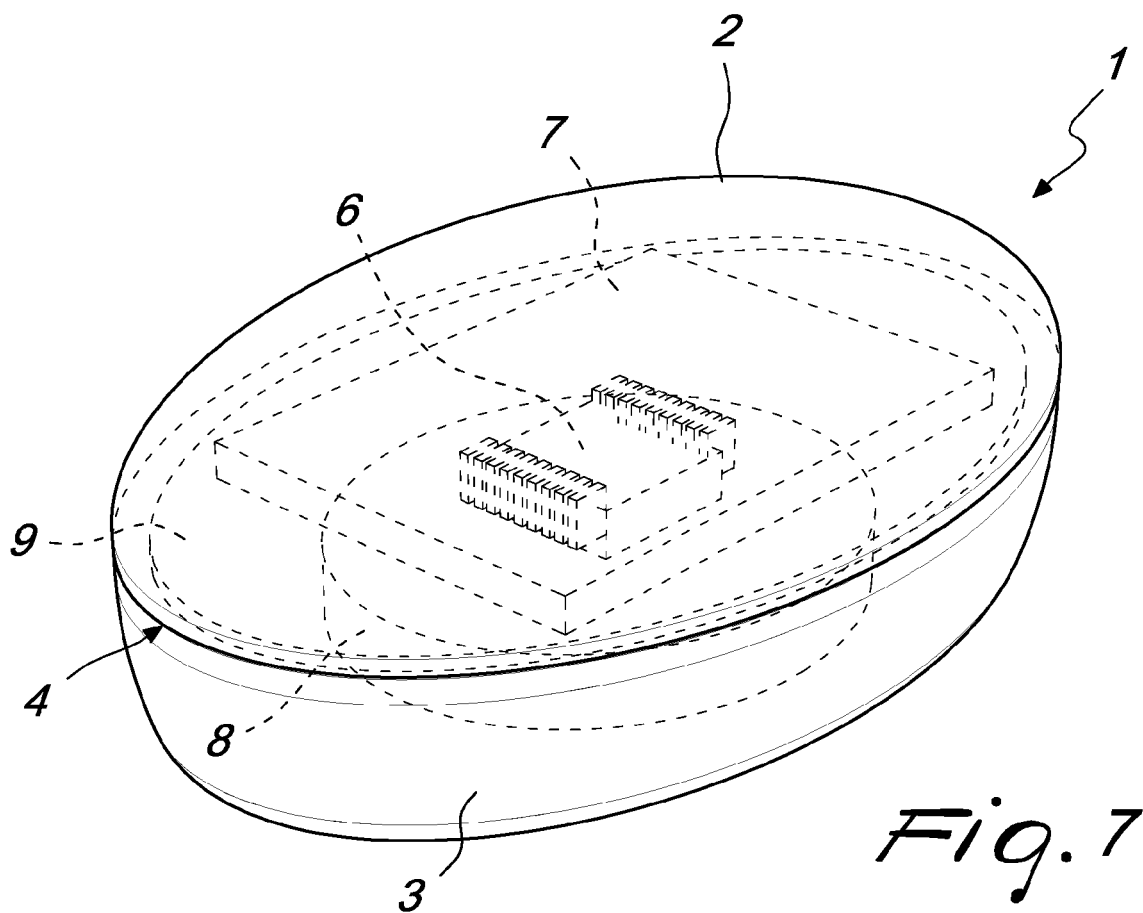
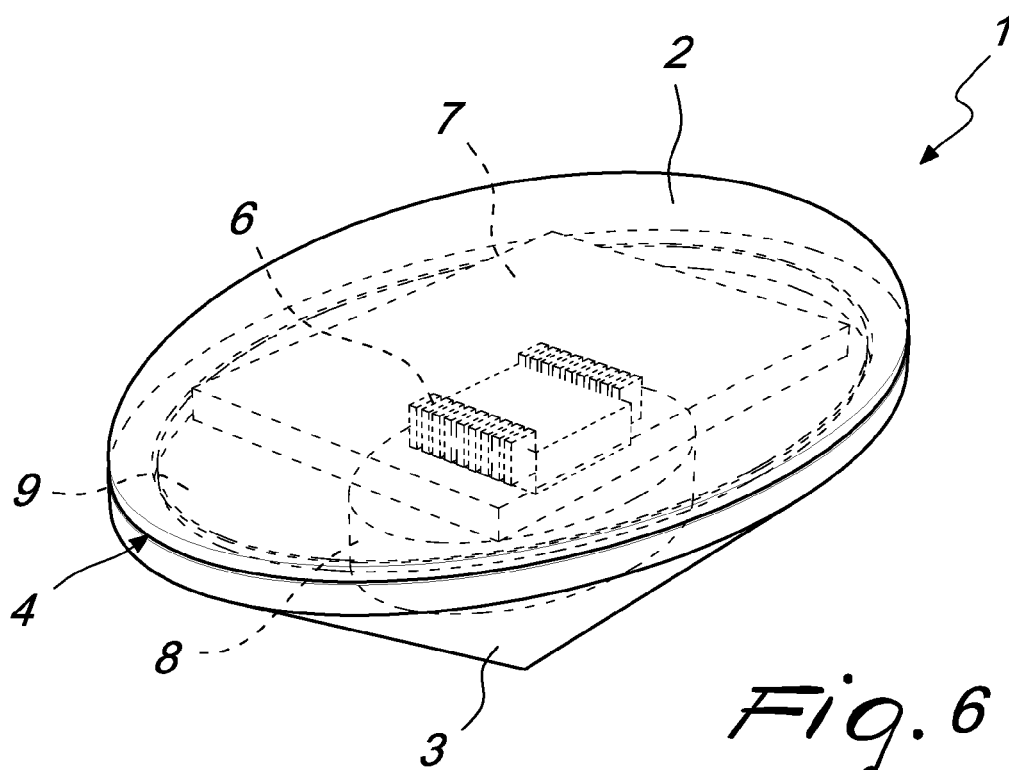


Fig. 5





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Application Number
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 29 March 2017	Examiner van Voorst, Frank
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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