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### **Description**

The invention relates to an external rearview device for a motor vehicle comprising: a base assembly provided for arrangement on the motor vehicle; a head assembly configured to be attached to the base assembly; and rearview means comprising at least one of a camera unit and a reflective element secured within the head assembly. In addition, the invention relates to an external rearview device kit and a vehicle with an external rearview device of the invention.

European Patent No. 2 492 145 B1 describes an external rearview mirror with a mirror head and a mirror base, which are covered with at least one body element in the form of a body frame, a body cap and a mirror base cover, and a mirror glass that is installed rigidly relative to the mirror head. The mirror head rests on the mirror base, the body cover of the mirror head is composed of multiple pieces of the body frame and the body cap, where the body cap has an opening designed for the passage of the mirror base and the mirror base cover. The mirror base is rigidly connected to a mirror carrier that carries an electrical glass adjustment drive, where the glass adjustment drive is connected to at least one body element.

Another external rearview mirror assembly for a motor vehicle includes a mirror base or foot provided for arrangement on the motor vehicle and a mirror head arranged on the mirror foot as well as a mirror glass accommodated in the mirror head and arranged rigidly and fixed non adjustably with respect thereto. Such an external rearview mirror is described in European Patent No. 2 492 144 B1. At least one articulation is provided between the mirror head and the arrangement of the mirror foot on the motor vehicle. The articulation includes a total of

two articulation axes, and the direction vectors of the articulation axes are independent of each other. The two articulation axes are associated, jointly and/or independently of each other for swiveling the mirror head from an operating position to a swung-in position and vice versa. The articulation axes are also for swinging-in the mirror head in and against the direction of motion, adjusting an individual adjusting position of the mirror glass by adjusting the mirror head depending on, e.g., the seating position and the height of a driver of the motor vehicle. The mirror has a first adjusting drive driven by an electric motor and associated to a first articulation axis of the two articulation axes and a second adjusting drive driven by an electric motor and associated to a second articulation axis of the two articulation axes.

Rearview devices housing a camera in a base assembly to be attached to a vehicle are known in the state of the art. For example European Patent No. 2431225 describes an exterior mirror having a sensor accommodated in the mirror base to which a mirror head carrying a reflective element is mounted. On the other hand a rearview device can be equipped only with different camera and/or illumination devices. It is for example known to moveably attach camera and/or illumination means to a vehicle, see e.g. in German patent application No 10 2017 109 872.0.

Current state of the art allows for either conventional exterior rearview mirrors or mirror replacement technologies via camera systems. However, not all global markets allow for camera side mirror replacement, which prevents one technical solution for global market vehicles.

It is therefore the object of the present invention to further develop the known rearview devices in order to overcome the drawbacks of the prior art.

This object is achieved in that the head assembly is configured to be detachable and is selected from a set comprising a first head assembly with a first rearview means comprising at least one reflective element, preferably in form of a mirror glass, and a second head assembly with a second rearview means comprising at least one reflective element, preferably in form of an at least partly translucent mirror glass, and a camera unit being configured to obtain a rearview image through the reflective element, and a third head assembly with a third rearview means comprising a camera unit configured to obtain a rearview image through an opening.

It is proposed that the first, second and third head assembly are exchangeable with each other, and/or the first, second and/or third head assembly is moveably attachable to the base assembly, and/or the base assembly is fixed relative to the motor vehicle .

Furthermore it is preferred that the first and second head assembly are moveable and the third head assembly is fixed, and/or each moveable head assembly comprises an articulation assembly, the articulation assembly comprising a fixed part attached to the fixed base assembly and a moveable part attached to the head assembly.

External rearview devices of the invention can be characterized by a locking system with a locked state and an unlocked state, wherein the head assembly is removable from the base assembly in the unlocked state and locked to the base assembly in the locked state, with the locking system preferably being suited to be actuated by a driver of the vehicle to switch between the locked and the unlocked state, and vice versa, and/or with preferably actuating means of the locking system being suited to be actuated manually, electrically and/or via a remote device, such as a smart key or the like, and/or via a gesture and/or voice command.

According to the invention it is proposed that a pivot joint system is provided between the base assembly and the head assembly, preferably comprising at least one spherical seat.

Preferred external rearview devices of the invention are further characterized by a cradle, wherein the cradle has a seat adapted to be put on the base assembly and to be attached by attaching a case frame to the base assembly, and/or the cradle is configured to attach to the base assembly via the pivot joint system, and/or the cradle comprises a recess or opening for accommodating at least part of the articulation system, preferably an actuator system of the articulation system.

It is proposed that the pivot joint system acts between the base assembly and the case frame and/or bayonet means fixedly attached to the case frame, and/or the pivot joint system comprises a torsion spring, the torsion spring preferably having one end attached to the base assembly and the other end attached to the case frame and/or the bayonet means.

It is also proposed that the cradle, in particular the seat of the cradle, is arranged between two sealing means acting as pivot seals, with preferably one sealing means being attached to the base assembly and the other sealing means being attached to the case frame, and/or with preferably each sealing means being a 2 component gasket with a hard part providing a clips function and a soft part compensating tolerances.

With the invention it is further proposed that the seat of the cradle is a spherical seat, being concentrically to the axis of the pivot joint system.

Still further, external rearview devices of the invention can be characterized by at least one functional module, comprising a further camera, a light module, in particular in form of a turn signal indicator module and/or a blind spot indicator module, a display, in particular integrated in the head assembly and/or provided together with the reflective element, a Bluetooth module and/or a sensor module, in particular a temperature sensor.

In an alternative, an external rearview device of the invention is characterized by a camera connector, which is positioned in a non-moving area of the fixed base assembly or in a non-moving area of the moveable head assembly and receives the camera unit.

The first, second and third head assembly each can comprise an upper cover and a front cover, with preferably the first, second and/or third head assembly each comprising a lower cover for housing an internal structure, in particular comprising a case frame and/or the articulation assembly.

It is preferred that the upper covers and/or lower covers of the first and second head assemblies have the same structure, and/or the front covers of the first and second head assemblies have the same structure, and/or the front covers of the first, second and third head assemblies each comprise a bezel, with the bezel of the second head assembly preferably having an opening such that the camera unit can obtain a rearview image through the reflective element and/or comprises the bezel of the third head assembly, and/or the second head assembly comprises the third head assembly.

In addition, the invention proposes that the case frame and/or the articulation assembly is provided with attachment means for the attachment of a fixed component or the camera unit.

Preferred external rearview devices of the invention are further characterized in that the base assembly is configured to receive the first, second or third head assembly via a head assembly interface, and/or the base assembly is selected from a plurality of different base assemblies, in particular comprising a sail mount base assembly, a waist mount base assembly and a door mount base assembly, and/or the base assembly is adapted to the motor vehicle.

Each base assembly can comprises a base frame, one or more base covers, a gasket and a pivot seal, with preferably a bayonet tower extending into the head assembly interface.

Furthermore, it is proposed with the invention that the camera unit is suited to provide at least a field of view fulfilling the legal requirements and/or a field of view fulfilling outside the legal requirements, with preferably the camera unit of the third head assembly being suited to provide at least a field of view fulfilling the legal requirements and/or the camera unit of the second head assembly being suited to provide at least a field of view fulfilling the legal requirements and/or a field of view fulfilling outside the legal requirements.

The invention also provides an external rearview device kit suited to provide an external rearview device of the invention with at least one base assembly and a first, second and third head assembly.

The external rearview device kit of the invention can be provided with a plurality of base assemblies.

Finally, the invention also provides a vehicle with at least one rearview device of the invention.

Accordingly, the invention provides a modular design of a rearview device allowing a common fit to vehicles and common components to deliver a conventional exterior mirror or a combination of a mirror plus camera or a camera pod system. Thus, three solutions are provided by a rearview device kit of the invention combining one technical solution with respect to the base assembly but still allowing adaption to legal requirements and/or preferences with respect to the rearview means. Thus, a customer can select between all three different kinds of possible rearview devices, depending on comfort, security and drive assistance features.

The foregoing summary, as well as the following detailed description, will be better understood when read in conjunction with the appended drawings. For the purpose of illustration, certain examples of the present description are shown in the drawings. It should be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate an implementation of system, apparatuses, and methods consistent with the present description and, together with the description, serve to explain advantages and principles consistent with the invention. :

- Figure 1A is a perspective view of a first rearview device of the present invention, with a mirror glass.
- Figure 1B is a perspective view of a second rearview device of the present invention, with a mirror glass and a camera.
- Figure 1C is a perspective view of a third rearview device of the present invention, with a camera.
- Figure 2A is an exploded view of the head assembly of an alternative first rearview device.
- Figure 2B is an exploded view of the head assembly of an alternative second rearview device.
- Figure 2C is an exploded view of the head assembly of an alternative third rearview device.
- Figure 2D is a perspective view of the base assembly to which any one of the head assemblies of figures 2A, 2B and 2C can be attached.
- Figure 3A is a front view of a further alternative of a first rearview device of the present invention, with a head assembly providing only a mirror glass.
- Figure 3B is a cross-section taken along line AA of figure 3A.

- Figure 3C is a cross-section taken along line AA of figure 3A, with a head assembly providing both a mirror glass and a camera.
- Figure 3D is a front view of a further alternative of a third rearview device of the present invention, with a head assembly providing only a camera.
- Figure 3E is a cross-section taken along line BB of figure 3D.
- Figure 4A is a perspective view of a still further first rearview device of the present invention, for carrying a mirror glass.
- Figure 4B is a perspective view of a still further second rearview device of the present invention for carrying a mirror glass and a camera.
- Figure 4C is a perspective view of a still further third rearview device of the present invention for carrying a camera.
- Figure 5A is a perspective view of a motor cradle for a first or second rearview device according to the invention.
- Figure 5B is a perspective view of the motor cradle of figure 5A together with a case frame attached to a base assembly.
- Figure 5C is a part side view of the motor cradle of figure 5A together with a case frame and sealing means, with the motor cradle shown in phantom.
- Figure 5D is a part cross sectional view of the motor cradle of figure 5A together with the case frame and sealing means.
- Figure 6A and Figure 6B are diagrams illustrating a front view of a camera located within a base assembly and a respective section view along the line 6b-6b illustrated in figure 6A.
- Figure 7 is a diagram illustrating a side cross-sectional view of a head assembly with a camera located on a fixed base frame.

Figure 8A is an exploded view of a first base assembly.

Figure 8B is an exploded view of a second base assembly.

Figure 8C is an exploded view of a third assembly.

Throughout the drawings and the detailed description, unless otherwise described, the same drawing reference numerals will be understood to refer to the same elements, features, and structures. The relative size and depiction of these elements may be exaggerated for clarity, illustration, and convenience.

The following detailed description is provided to assist the reader in gaining a comprehensive understanding of the methods, apparatuses, and/or systems described herein. Accordingly, various changes, modifications, and equivalents of the systems, apparatuses and/or methods described herein will be suggested to those of ordinary skill in the art. Also, descriptions of well-known functions and constructions may be omitted for increased clarity and conciseness.

The term “rearview” is here defined as a view of the surrounding area, which is not in the field of view of the driver, i.e. the directions opposing, left, right, below and above of the viewing direction, but can also comprise the view in the direction of the viewing direction of the driver and/or any combinations of the directions.

A first external rearview device 10 according to the invention is shown in figure 1A. It comprises a fixed base assembly 61 provided for arrangement on a not shown motor vehicle, a moveable head assembly 60 attached to the base assembly 61, an articulation assembly (not shown), the articulation assembly comprising a fixed part attached to the fixed base assembly 61 and a moveable part attached to the head assembly 60, and a reflective element in form of a mirror glass 80 secured within the moveable head assembly 60. The mirror glass 80 also provides an indicator means 81 with a not shown light module being arranged behind the mirror glass 80 to provide in particular a warning signal. The light module can belong a blind spot indicator module.

A second external rearview device 10' according to the invention is shown in figure 1B, which differs from the first external rearview device 10 by comprising a camera unit 85

behind the mirror glass 80', with the camera unit 85 being shown in figure 1B through the mirror glass 80', which is translucent at least in the region of the camera unit 85.

A third external rearview device 10'' according to the invention is shown in figure 1C, which differs from the first and second external rearview devices 10, 10' by comprising a camera unit 85, but no mirror glass.

The common feature of all three external rearview devices 10, 10', 10'' is that they make usage of the same fixed base assembly 61 to which in each of the shown alternatives a different head assembly 60, 60', 60'' is attached. Thus, the base assembly 61 and the head assemblies 60, 60', 60'' form a modular set allowing to selectively attach either the head assembly 60 or the head assembly 60' or the head 60'' to the base assembly 61 to provide a high degree of flexibility by using a kit allowing a quick adaption to different legal requirements and/or preferences with respect to external rearview devices.

In order to facilitate the attachment, of one of the three head assemblies 60, 60', 60'', locking means, in particular those described in the German patent application no. 10 2017 112 915 filed on June 12, 2017 and US patent application 16/005,923 filed on June 12, 2018 for EXTERIOR REARVIEW DEVICE WITH REMOVABLE HEAD AND VEHICLE THEREWITH, which are hereby incorporated by reference, can be used.

Still further a pivot joint system can be used between the 2 component, namely the base assembly 61 and the head assembly 60, 60', 60'', as described in international patent application PCT/EP2018/067842 filed on July 2, 2018, for REARVIEW DEVICE WITH MOVEABLE HEAD ASSEMBLY AND VEHICLE THEREWITH, which is hereby incorporated by reference. Some aspect of this pivot joint system are described below with respect to figures 5A to 5D. This pivot joint system enhances functionality and facilitates the attachment.

Figures 2A to 2D show an external rearview device kit comprising three different sets of head assembly 60, 60' and 60'' shown in figure 2A, 2B and 2C, respectively, as well as one base assembly as shown in figure 2D.

According to figure 2A the head assembly 60 comprises a cap or upper cover 60a, a case lower or lower cover 60b as well as a front cover 60c, comprising a bezel 75 carrying a mirror glass 80. The covers 60a, 60b and 60c enclose an internal structure comprising a case frame 88 and an articulation assembly 89 for the mirror glass 80.

In analogy to the head assembly 60 of figure 2A which only makes usage of a mirror glass 80, the head assembly 60 of figure 2B makes usage of an upper cover 60a, a lower cover 60b, a front cover 60c and an internal structure 88, 89. In addition, a camera 85 is arranged between the internal structure with a case frame 88 and an articulation assembly 89 and the front cover 60c. Still further, the front cover 60 comprises a bezel 75' which is provided with an opening as described with respect to the figure 3C below in order to allow the camera 85 to look through the mirror glass 80.

The head assembly 60'' of figure 2C also makes usage of an upper cover 60a'', a lower cover 60''b and front cover 60''c enclosing an internal structure in form of a case frame 88'' with a camera 85 to be attached to the case frame 88'' and extending through an opening 60''cc within the front cover 60''c. The head assembly 60'' does not comprise an articulation assembly, but only a case frame 88' to which the camera 85 is to be attached. Thus, no motor is needed and the head assembly 60'' is fixed relative to the base assembly 61 when assembled.

Each of the head assembly 60, 60' and 60'' of figures 2A, 2B and 2C can be attached to the base assembly 61 shown in figure 2D via an bayonet tower 61a and making usage of a special sealing means 97. Further details of the attachment mechanism as well as sealing functions are described in the German application no. 10 2018 116 011 filed on July 02, 2018 for SEALING MEANS, BASE ASSEMBLY WITH SUCH SEALING MEANS AND REARVIEW DEVICE WITH SUCH BASE ASSEMBLY and in the German patent application no. 10 2018 116 008 filed on July 02, 2018 for BASE ASSEMBLY AND REARVIEW DEVICE THEREWITH, which are hereby incorporated by reference.

Figures 3A to 3E depict an alternative external rearview device kit according to the invention. Figures 3A to 3C explain how to assemble a rearview device with a mirror glass, with or without an additional camera, whereas figures 3D and 3E explain how to assemble a rearview device making usage solely of a camera.

According to figure 3A the external rearview device 10 comprises a base assembly 61 attached to a motor vehicle 100, with a head assembly 60 being attached to the base assembly 61, and the head assembly 60 only providing a mirror glass 80. Details of this structure can be obtained from figure 3B showing a cross-section along line A-A of the figure 3A.

Accordingly, the head assembly 60 comprises an upper cover 60a with attachment means 60aa for the internal structure carrying the articulation assembly 89. In addition, the bezel 75 is attached to the upper cover 60a and the lower cover (not shown) to carry the mirror glass 80 with the front cover.

In case not only a mirror glass 80 is to be used, but also a camera 85, the head assembly 60 of figure 3B is to be exchanged by the head assembly 60' of figure 3C. In fact, the same upper cover 60a and articulation means 89 can be used, whereas only an attachment means 89a is to be exchanged with an attachment means 89'a to hold the camera 85. Still further, the bezel 75' of the front cover of the head assembly 60' is provided with an opening 75'a such that the camera 85 can extend until the rear of the mirror glass 80.

Figure 3D shows a front view of a third rearview device having a base assembly 61 attached to a motor vehicle 100 corresponding to the base assembly 61 of figure 3A. Said base assembly 61 of figure 3D carries a head assembly 60'' shown in further details in figure 3E along line B-B of figure 3D. The cross section of figure 3E shows the upper cover 60''a closed by a front cover 60''c having an opening 60''cc such that the camera 85', in particular a lens of the camera unit, can extend through said opening 60''cc. The camera unit itself is attached within the head assembly 60'' via attachment means 89''a.

The driver and passenger field of view requirements for passenger vehicles determine mirror glass height and mirror proportions, which defines the corresponding dimensions of a head assembly carrying a mirror glass. The field of view which must be present on a rear view mirror is given by a so-called rhombus according to the regulation 46 of the Economic Commission for Europe of the United Nations (UNECE) — Uniform provisions concerning the approval of devices for indirect vision and of motor vehicles with regard to the installation of these devices – specifying the vehicle requirements with respect to safety, among other the minimum height and width of the rear view mirrors of vehicles. The field of view (rhombus) on the passenger side has to be larger than the field of view on the driver side, since the

distance between driver and rear view mirror is larger when viewing the rear view mirror on the passenger side. Since the size of rear view mirrors is desired as to be symmetrical for driver and passenger side, the passenger rhombus dictates the size of the rear view mirror also on the driver side. The present inventions fulfills the demand of providing symmetrical rearview devices for driver and passenger sides when using a camera unit, in particular on the passenger side, with the usage of a camera unit providing further degree of freedom with respect to the size of the rearview devices. When displaying the field of view on the passenger side via a display to the driver, the larger rhombus of the passenger side no longer dictates the size of the rear view assembly on the driver side when using a camera unit. Thus, the rearview device on the driver side can be reduced to a size adapted to the smaller rhombus for the driver side resulting in a much smaller rearview device, especially in a much smaller head assembly. The image size can be adapted electronically when using a camera unit. Therefore the rearview devices with a second or third head assembly can be minimized to the minimum size required for the driver side resulting in a much smaller set of rearview devices to be mounted on vehicles. This size reduction improves the air resistance, noise and the weight of the vehicle and thus its performance.

With a second head assembly of the external rearview device kit a backup solution is provided to observe the traffic conditions behind the vehicle even in case of a malfunction of the camera unit, because the rearview device still comprises a mirror glass providing a field of view of the traffic behind.

Further details on possible size reduction are described in the application no. 18 198 678 filed on October 4, 2018, for REAR VIEW ASSEMBLY VEHICLE WITH SUCH REAR VIEW ASSEMBLY, which is incorporated by reference. The different sizes also become more apparent from the external rearview devices according to the invention shown in figures 4A to 4C.

The rear view device of figure 4A makes usage of a moveable first head assembly 60 with an upper cover 60a and a bezel 75 for embracing a not shown mirror glass supported on a case frame 88 and an articulation assembly 89. The first head assembly 60 is attached to a base assembly 61 relative to which it can move.

The rear view device of figure 4C makes usage of a fixed third head assembly 60'' with an upper cover 60''a and a bezel 75'' for embracing a not shown camera unit supported only on a case frame 88'. The third head assembly 60'' is fixedly attached to a base assembly 61 and has a reduced size in z direction running vertically in figure 4C, as the camera unit can be controlled to obtain different field of views, comprising the field of view according to the regulation 46 of the Economic Commission for Europe of the United Nations (UNECE).

The rear view device of figure 4B makes usage of a fixed second head assembly 60' comprising the third head assembly 60'' as well as a further upper cover 60'a and a bezel 75' for embracing a not shown mirror glass. The second head assembly 60' is fixedly attached to a base assembly 61 and has a larger size in z direction than the third head assembly. The camera unit of the second head assembly can be controlled to obtain different field of views, not restricted to the field of view according to the regulation 46 of the Economic Commission for Europe of the United Nations (UNECE) which is already covered by the mirror glass. Rather, the camera unit can have a field of view outside the field of view according to the regulation 46 of the Economic Commission for Europe of the United Nations (UNECE) allowing a variety of functions in particular suited for drive assistance systems.

Figure 5A depicts the backbone of a rearview device of an embodiment of the invention in form of a cradle 90. The cradle 90 provides a motor opening 91 for the attachment of a motor, a base seat 92 in order to be attached to a base assembly, tool openings 93a, 93b in order to attach the cradle 90 to a jig like light tool to facilitate assembly of the rearview device, openings 94a, 94b for attaching a bezel assembly and harness and a clamp element 95 for embracing a clamp cradle. The following figures 5B to 5C will further illuminate the different functions of the cradle 90 for the connection between a base assembly and a head assembly.

As can be seen from figure 5B, the cradle 90 can be placed with its seat 92 on a base assembly 61 with sealing means 97 being arranged there between and a case frame 88 being attached to the base frame 61 and thereby attaching the cradle 90 to the base assembly 61.

Figure 5C demonstrates a pivot joint system acting between the base assembly 61 and the case frame 88 and, thus, the head assembly, with the cradle 90 being arranged between the base assembly 61 and the case frame 60, surrounded on each side of its seat 92 by sealing means 96, 97. Said pivot joint system corresponds substantially to the one described in detail in the

international patent application PCT/EP 2018/063665, to which reference is made in this respect.

Each sealing element 96, 97 is provided as a two component gasket with a hard part and a soft part. The hard part serves for attachment and the soft part for compensating tolerances. Figure 5D shows the pivot joint system in more detail with respect to the relative arrangement of the two sealing means 96, 97 on both sides of the base seat 92 of the cradle 90.

The rearview device of the invention can be provided with a plurality of different functional modules, comprising a further camera, further light modules, a display, a Bluetooth module, a sensor module and the like. With respect to figures 6A to 7 the mounting of cameras is further described.

Referring to figures 6A and 6B, due to the movement of a head assembly 60, a non-moving area for securing a further camera 62 may be used. In this example, the camera 62 is positioned in a solid, non-moving area which does not move when the head actuates. Figures 6A and 6B show the camera 62 located in a mirror base assembly 61 fixed on a base frame 65 with a camera connector 66. The camera 62 is covered by a base cap 63 and the base assembly is covered by a base cover 64 and secured via a gasket 67 to a motor vehicle (not shown). Figure 6B illustrates a section view along the line 6b-6b of figure 6A. In this example, the camera 62 is fixed in the mirror base assembly 61 of a rearview device.

In another example, the camera may be fixed to the head assembly 60. As shown in figure 7, a camera 73 is mounted on a base frame 72 that is connected to a base assembly 77. Attached to the base frame 72, as well, is an articulation assembly 70 that moves the mirror head connected via an upper cradle 71a and lower cradle 71b. An upper casing element 76a is connected to the upper cradle 71a, and a lower casing element 76b is connected to the lower cradle 71b. The head assembly is finally locked through a bezel 75 that carries a reflective element in form of a mirror glass 80.

The camera 73 is fixed by a camera cradle 74 and is directed to view through an opening in the bezel 75 through the glass 80 and/ or to view under the mirror through a lens 78, which is installed in the lower casing element 76b. As in the configuration of figures 6A and 6B, the camera of figure 7 is secured to a solid, non-moving area that does not move when the head

actuates. The camera 73 is packaged into the case frame of the head assembly 60. This provides the camera 73 with a number of different fields of view; in particular, producing at least images of the rear of the vehicle, the side of the vehicle, the front of the vehicle, or the underneath the mirror or the vehicle. In the illustrated example, the camera 73 is directed to view behind the vehicle through the glass 80 and underneath the mirror through the lens 78.

The camera 73 can be comprised by the camera unit 85 described with respect to figure 1B.

The base assembly can also be selected from a plurality of different designs for adaptation to different vehicles. As different car manufactures prefer different designs, also of their rearview devices, the provision of a plurality of base assemblies enables to adapt to the respective preferences. Figures 8A, 8B and 8C depict three design variants of the base assembly.

The design variant of figure 8A shows a sail mount base assembly 50 with a base frame 51, an upper and a lower base cover 52, 53, a gasket 54 and a pivot seal 55. The design variant of figure 8B shows a waist mount base assembly 50' with a base frame 51', two base covers 52', 53', a gasket 54' and a pivot seal 55'. The design variant of figure 8C shows a door mount base assembly 50'' with a base frame 51'', two base covers 52'', 53'', a gasket 54''' and a pivot seal 55''.

Other variants also lie within the scope of this invention. All possible base assemblies have in common that they provide a head assembly interface suited to attach any one of the head assemblies described above to provide maximal flexibility. That is, as the different base assemblies are adapted to the different vehicles and the different head assemblies provide different rearview options, different vehicles can be equipped with different rearview options by making usage of a rearview device kit of the invention. Thus, the invention provides a standardization of modules in order to fulfill different legal requirements or personal preferences independent on the vehicle.

Still further, different functions and devices can be incorporated into and/or controlled with the help of rearview devices.

Especially useful are functions and devices to enhance, extend and/or sustain the functionality of the rearview device during normal or extreme conditions. This may include heating and/or cooling means, cleaning means such as wipers, liquid and/or gaseous sprays, actuator means for moving the rearview device or parts of it, such as for example a display, a camera system and/or parts of a camera system, including for example lenses, filters, light sources, adaptive optics like deformable mirrors, sensors and/or mirrors, and/or actuator means for inducing movement of other objects, for example parts of the vehicle and/or objects surrounding the vehicle. Furthermore it can include linear tracks and/or rotating wheels, like for example a filter wheel, for exchanging optical elements, including for example lenses, mirrors, light sources, sensors, adaptive optics like deformable mirrors and/or filters.

Prominent examples for functions and devices incorporated into and/or controlled with the help of rearview devices include also illumination devices, for example any kind of light module like an external light module, an internal light module, a front light, a back light, a fog light, a brake light, an acceleration light, a turn signal, a logo lamp, a puddle light, a flash light, a navigation light, a position light, an emergency light, a spotlight, a green light, a red light, a warning light, a turn signal light module, an approach light, a search light, an information light, a display and/or any combination thereof.

Further examples for functions and devices incorporated into and/or controlled with the help of rearview devices may include for example a tiredness detection system, a microsleep detection system, a distance and/or velocity determination system, for example a LIDAR (Light detection and ranging) system, a blind spot indicator system, a lane change assistant system, a navigation assistant system, a tracking assistant system, a human-machine interaction system, a machine-machine interaction system, an emergency and precaution assistant system, like an accident avoiding assistant system, a counter-measures assistant system, a brake assistant system, a steering assistant system, an acceleration assistant system, an escape assistant system, including for example an ejection seat system, a direction indicator, a blind spot indicator, an approach system, a strong braking system, an emergency braking system, a charging status indicator, a vehicle mode system, including for example a sports mode system, an economy mode system, an autonomous drive mode system, a sleep mode system and an anti-theft system, a vehicle locked indicator system, a vehicle stolen

indicator, a warning signal system, a temperature indicator system, a weather indicator system, a traffic light signal system, a fuel status system and/or any combination thereof.

An example for a rearview device including an illumination device fulfilling the brake light functions is disclosed in German patent application No. 102012108488, filed on September 11, 2012 for REARVIEW ASSEMBLY FOR MOTOR VEHICLE and hereby incorporated herein by reference. A light guidance unit for an illumination device used in a back vision system is disclosed in German patent application No. 102012104529, filed on May 25, 2012 for LIGHT GUIDANCE UNIT which is hereby incorporated herein by reference. An illumination device for a rearview device is disclosed in German patent application No. 102012107833, filed on August 24, 2012 for ILLUMINATION DEVICE AND REARVIEW DEVICE which is hereby incorporated herein by reference. A lighting device for a back-vision unit is disclosed in German patent application No. 102012107834, filed on August 24, 2012 for LIGHTING DEVICE AND BACK-VISION UNIT which is hereby incorporated herein by reference. A housing and display device of a rearview device is disclosed in European patent No. 2738043, filed on December 3, 2012 for HOUSING AND DISPLAY DEVICE which is hereby incorporated herein by reference. An optical light guide for a vehicle lighting unit is disclosed in European patent No. 2947378, filed on May 22, 2014 for OPTICAL LIGHT GUIDE FOR A VEHICLE LIGHTING UNIT which is hereby incorporated herein by reference. A display device of a rearview device of a vehicle is disclosed in International patent application No. 2015/173695, filed on May 7, 2015 for DISPLAY DEVICE, REARVIEW DEVICE AND MOTOR VEHICLE and claiming priority to European patent application No. 2944866, filed on May 12, 2014 for OPTICAL UNIT, DISPLAY DEVICE, REARVIEW DEVICE AND MOTOR VEHICLE INCLUDING THE SAME which are all hereby incorporated herein by reference. Further a light guiding device for an illumination device, in particular for a motor vehicle or a display device, in a rearview device of a motor vehicle is disclosed in European patent application No. 3045944, filed on January 19, 2015 for LIGHT GUIDING DEVICE which is hereby incorporated herein by reference. Still further a light guiding device for an illumination device, especially for a motor vehicle or an indicator device in a rearview device of a motor vehicle is disclosed in U.S. patent application No. 15/228,566, filed on August 4, 2016, for LIGHT GUIDING DEVICE and is a continuation-in-part of U.S. patent application No. 15/000,733, filed on January 19,

2016 for LIGHT GUIDING DEVICE which are all hereby incorporated herein by reference. In addition, an illumination device, particularly for a rear-view device of a motor vehicle and a method for producing the same are disclosed in International patent application No. 2016/147154, filed on March 18, 2016 for ILLUMINATION DEVICE AND METHOD FOR PRODUCING AN ILLUMINATION DEVICE and claiming priority to German patent application No. 102015104163, filed on March 19, 2015 for ILLUMINATION DEVICE AND METHOD FOR PRODUCING AN ILLUMINATION DEVICE which are all hereby incorporated herein by reference. An improved rear-view device for a motor vehicle which includes an electronic device is disclosed in U.S. patent application No. 15/256,532, filed on September 3, 2016 for ELECTRONIC DEVICE AND REAR-VIEW DEVICE and claiming priority to European patent application No. 3139711, filed on September 3, 2015 for ELECTRONIC DEVICE AND REARVIEW DEVICE which are all hereby incorporated herein by reference. A lighting device for a rearview device or a footwell device of a vehicle, including at least one luminous means is disclosed in German patent application No. 102015115555, filed on September 9, 2015 for ILLUMINATION DEVICE, REARVIEW DEVICE, FOOTWELL DEVICE AND VEHICLE which is hereby incorporated herein by reference. A light module for a light assembly of an exterior rearview device is disclosed in European patent application No. 3138734, filed on September 3, 2015 for LIGHT MODULE, LIGHT ASSEMBLY AND REARVIEW DEVICE FOR A VEHICLE which is hereby incorporated herein by reference. A lighting device for a vehicle component, in particular for a rearview device of a motor vehicle, including a logo lamp and a deflection mirror are disclosed in European patent application No. 3144183, filed on September 13, 2016 for LIGHTING DEVICE, VEHICLE COMPONENT AND VEHICLE and claiming priority to German utility patent application No. 202015104894, filed on September 15, 2015 for LIGHTING DEVICE, VEHICLE COMPONENT AND VEHICLE which are all hereby incorporated herein by reference.

A camera module can include in particular a plurality of different optical elements, including a.o. a variety of sensors and light sources, as well as housing parts.

The housing of a camera module can be made out of plastic, metal, glass, any other suitable material and/or any combinations thereof and can be used in combination with the techniques described below to change or modify the properties of the material or the material surface.

Housings are for example described in German patent application No. 102016108247.3, filed on May 3, 2016 for CLEANING SYSTEM FOR A CAMERA and U.S. patent application No. 15/281,780, filed September 30, 2016 for TELESCOPING REARVIEW ASSEMBLY WITH CAMERA AND LENS WIPING SYSTEM, which are all hereby incorporated herein by reference.

The camera can include for example CCD or CMOS or light field sensors, as for example described in German patent application No. 102011053999, filed September 28, 2011 for DETECTION SYSTEM FOR OPTICAL DETECTION OF OBJECT AND/OR REGION OF SPACE FOR DRIVER ASSISTANCE AND/OR DISPLAY SYSTEMS OF MOTOR VEHICLE, HAS OPTICAL SENSOR ARRANGED AS LIGHT FIELD SENSOR FOR DETECTION and U.S. patent application No. 09/771,140, filed on January 26, 2001 for MONITORING DEVICE FOR VEHICLES, IN PARTICULAR, MOTOR VEHICLES, now U.S. patent No. 6,703,925, which are all hereby incorporated herein by reference. Also an area of the sensor can be reserved for different purposes, for example to detect a test beam, as described in U.S. patent No. 8,031,224, filed on September 9, 2014 for CAMERA SYSTEM, METHOD FOR OPERATION OF A CAMERA SYSTEM AND SENSOR DEVICE OF A CAMERA SYSTEM, which is hereby incorporated herein by reference.

The optical elements can be molded or formed from any type of glass or any other suitable material. Glass is here used in the meaning of a non-crystalline amorphous solid showing a glass transition when heated towards the liquid state. It includes for example the group of polymeric glasses, metallic glasses, silica glasses, but any other suitable material showing the glass transition can also be used. The glass can be either in a flat, wedge, rectangular, cylindrical, spherical, conical, elliptical, and/or circular shape, as described for example in German patent application No. 102016108247.3, and German patent application No. 102011103200, filed on May 31, 2011 for LIGHT WINDOW FOR USE AS LIGHT CONDUCTOR FOR TURN INDICATOR IN OUTSIDE MIRROR ARRANGEMENT OF VEHICLE, HAS UNCOUPLING STRUCTURES AT CERTAIN LOCATION OF WINDOW, AND OPTICAL FILM WITH MOLDED COATING AND PROVIDED WITH UNCOUPLING STRUCTURES, which are all hereby incorporated herein by reference, or have a shape according to different needs or lens types. As non-limiting examples camera modules can be equipped with lenses, like a wide-angle or fish-eye lens suitable to provide

peripheral images, as described in U.S. patent application No. 15/281,780, and U.S. patent application No. 13/090,127, filed on April 19, 2011 for REARVIEW MIRROR SIMULATION, now U.S. patent No. 9,238,434, a Fresnel lens or micro lenses as described in German patent application No. 102011053999, filed September 28, 2011 for DETECTION SYSTEM FOR OPTICAL DETECTION OF OBJECT AND/OR REGION OF SPACE FOR DRIVER ASSISTANCE AND/OR DISPLAY SYSTEMS OF MOTOR VEHICLE, HAS OPTICAL SENSOR ARRANGED AS LIGHT FIELD SENSOR FOR DETECTION, and a TIR (total internal reflection) lens as described in U.S. patent No. 8,740,427, filed September 8, 2010 for OPTIMAL LIGHT COUPLING FOR REARVIEW DEVICES, which are all hereby incorporated herein by reference. Another type of optical elements known to be used in camera modules are optical fibers, especially in form of fiber bundles and preferably in form of fiber bundles having an optical head, as described for example in U.S. patent application No. 09/771,140. Different methods can be used to produce such optical elements, for example as described in U.S. patent 8,460,060, filed on January 30, 2009 for METHOD FOR CREATING A COMPLEX SURFACE ON A SUBSTRATE OF GLASS, which is hereby incorporated herein by reference.

The optical elements can be transparent as described for example in U.S. patent No. 8,031,224, German patent application No. 102016108247.3, and U.S. patent application No. 13/242,829, filed September 23, 2011 for CAMERA ARRANGEMENT AND DOOR HANDLE FOR MOTOR VEHICLE, which are all hereby incorporated herein by reference. But the optical elements can also be semitransparent, as described in U.S. patent application No. 09/771,140 and U.S. patent application No. 13/090,127, which are all hereby incorporated herein by reference. Still further, the optical elements can be completely or partially coated with different type of coatings to realize different effects, such as for example anti-reflective coatings as described in U.S. patent No. 8,031,224, chromium-based reflective coatings as described in U.S. patent No. 9,181,616, filed on January 24, 2012 for CHROMIUM-BASED REFLECTIVE COATING, and other coatings, for example for polymeric substrates as described in U.S. patent application No. 14/936,024, filed on Nov. 9, 2015 for COATED POLYMERIC SUBSTRATES and in U.S. patent application No. 15/124,310, filed on Feb. 20, 2015 for DECORATIVE COATINGS FOR PLASTIC SUBSTRATES, which are all hereby incorporated herein by reference. Preferably the optical elements are made of a

scratch-proof material as described for example in German patent application No. 102016108247.3, which is hereby incorporated herein by reference. The optical elements can have uncoupling structures at certain locations of the optical elements, and an optical film, for example an extrusion film, and a molded coating can be applied as described in German patent application No. 102011103200, which is hereby incorporated herein by reference. A coating to spectrally and stress control is described in U.S. patent application No. 15/124,310, which is hereby incorporated herein by reference. Different filters can be integrated into the optical elements such as for example gray filters or polarization filters, described in U.S. patent application No. 14/809,509, filed July 27, 2015 for APPARATUS FOR LIGHT INTENSITY ADJUSTMENT, which is hereby incorporated herein by reference.

Electrochromic substrates, polymer electrolytes and other charge conducting medias may be used for the optical elements based on the descriptions of European patent application No. 08103179.1, filed on March 31, 2008 for PROCESS FOR PRODUCING ELECTROCHROMIC SUBSTRATES AND ELECTROCHROMIC ARTICLES MADE THEREFROM, European patent No. 2202826, filed on December 23, 2008 for POLYMER ELECTROLYTES AND DEVICES CONTAINING, U.S. patent No. 7,999,992, filed on January 7, 2005 for CHARGE CONDUCTING MEDIUM and U.S. patent No. 8,537,451, filed on March 26, 2008 for PROCESSES FOR PRODUCING ELECTROCHROMIC SUBSTRATES AND ELECTROCHROMIC ARTICLES MADE THEREFROM, which are all hereby incorporated herein by reference.

The camera module can also be equipped with apparatuses for light intensity adjustment as described for example in U.S. patent application No. 14/809,509 and light level intensifier tubes as described in U.S. patent application No. 09/771,140, which are all hereby incorporated herein by reference. The electrochromic substrates and devices used in European patent application No. 08103179.1, European patent No. 2202826, U.S. patent No. 7,999,992 and U.S. patent No. 8,537,451, which are all hereby incorporated herein by reference, can also be used for this purpose as well as a transflector to transmit or reflect light based on a corresponding input signal, as described in German patent application No. 102016106126.3, filed on April 4, 2016 for IMAGING SYSTEM, which is hereby incorporated herein by reference.

The camera module or a cover adapted to the camera module can be moved using different actuators, drives and/or a flexible track, as for example described in German application No. 102016108247.3 and U.S. patent application No. 15/281,780, which are all hereby incorporated herein by reference.

Still further, the camera module can also include cleaning elements to clean the optical element facing outwards and being exposed to the environment. The cleaning element can for example include wipers, brushes, lips, nozzles, fans and similar elements as are described in European patent application No. 14165197.6, filed April 17, 2014 for OPTICAL SYSTEM FOR A VEHICLE, CLEANING DEVICE AND VEHICLE COMPRISING AN OPTICAL SYSTEM, U.S. patent application No. 15/281,780, German patent application No. 102016108247.3, European patent application No. 13163677.1, filed April 15, 2013 for LENS WIPER, European patent application No. 15173201.3, filed June 22, 2015 for LENS CLEANING WITH FLEXIBLE ACTUATOR and European patent No. 1673260, filed on October 14, 2003 for CLEANING DEVICE which are all hereby incorporated herein by reference. The cleaning devices are not limited in composition, and may for example include any fabric, elastomeric, sponge, brush, or combination of these. Special wiper elements including wiper arms, wiper blades, wiping cloth, wiping tissue and combinations thereof are described in European patent application No. 14165197.6, which is hereby incorporated herein by reference. A wiper element may for example be controlled according to the method described in European patent application No. 130164250.6, filed April 18, 2013 for METHOD FOR CONTROLLING A WIPER DEVICE, which is hereby incorporated herein by reference. A reservoir for holding a cleaning liquid as described in European patent application No. 14165197.6, which is hereby incorporated herein by reference. Such a reservoir can be attached to or integrated into the camera module to provide the cleaning liquid to the optical elements of the camera module.

Different methods may be used to detect dirt or other obscurations preventing or reducing the functioning of the camera module, such as described in U.S. patent No. 8,395,514, filed on June 24, 2008 for OPTICAL SYSTEM AND METHOD FOR DETECTING OPTICAL SYSTEM OBSCURATION IN A VEHICLE, European patent No. 1328141, filed on January 12, for ASSEMBLY HAVING A CONDUCTOR FROM FLEXIBLE MATERIAL AND

METHOD FOR MANUFACTURING SUCH AN ASSEMBLY, and U.S. patent No. 8,031,224, which are all hereby incorporated herein by reference.

Also light sources can be installed or integrated into the camera module to increase the visibility of surrounding objects, measure distances and directions and detect dirt, such as described in U.S. patent No. 8,031,224, U.S. patent application No. 62/470,658, filed on March 13, 2017, 2016 for LIGHT EMITTING MIRROR BEZEL and U.S. patent application No. 09/771,140, which are all hereby incorporated herein by reference.

Different heating means, like heating coils, heating devices integrated into the lens holder or the bezel, or other heating elements can be used to impede condensation and icing at the surface of optical elements, as for example described in German patent application No. 102016108247.3, U.S. patent application No. 62/470,658, and German patent application No. 102016107545.0, filed on April 22, 2016 for HEATING DEVICE FOR A CAMERA LENS, which are all hereby incorporated herein by reference.

A watertight seal against weather effects, as well as against the influence of washing processes with detergents, solvents and high pressure cleaners can be used on the housing of the camera module as described in U.S. patent application No. 13/090,127, which is hereby incorporated herein by reference.

In another example, the housing can be made of a body including plastic and conductive material, wherein the conductive material is dispersed in the plastic material to form a conductive mass to allow a power source, preferably a DC voltage source, to connect via at least two electrodes to the body and heat the body accordingly, as described in German patent application No. 102016107545.0, which is hereby incorporated herein by reference.

A conductor track can be embedded within plastic parts of the camera module as described in European patent No. 1328141 and U.S. patent No. 7,083,311, filed on January 12, 2002 for CONDUCTOR OF FLEXIBLE MATERIAL, COMPONENT COMPRISING SUCH FLEXIBLE CONDUCTOR, AND METHOD OF MANUFACTURING SUCH CONDUCTOR, which are all hereby incorporated herein by reference.

The camera module can include a power harvesting system as described for example in European patent application No. 09171683.7, filed on Sept. 29, 2009 for SELF SUSTAINING REARVIEW MIRROR, which is hereby incorporated herein by reference.

A fault detection system for electric consumers as described in U.S. patent No. 8,487,633 filed on January 14, 2010 for FAULT DETECTION OF ELECTRIC CONSUMERS IN MOTOR VEHICLES, which is hereby incorporated herein by reference, can be used to detect failure of the camera module.

Different types of fixings can be used to fix the camera module to the vehicle or other components, such as for example the snap-fit connection described in European patent No. 2233360, filed on March 27, 2009 for SNAP FIT CONNECTION IN A REARVIEW MIRROR, which is hereby incorporated herein by reference.

Different control means and analyzing devices can be used, such as the computation units described in U.S. patent application No. 13/090,127, German patent application No. 102016106126.3, German patent application No. 102011053999, European patent No. 2146325, filed on July 16, for Recording Device for Receiving, Processing and Storing Image Files in a Vehicle and Method, and U.S. patent No. 8,849,104, filed on July 16, 2008 for RECORDING DEVICE AND METHOD FOR CAPTURING AND PROCESSING IMAGE DATA IN A VEHICLE, which are all hereby incorporated herein by reference. In addition, HDR (high dynamical range) technology can be used according to U.S. patent application No. 14/830,406, filed on Aug. 19, 2015 for REARVIEW DEVICE FOR A MOTOR and published as US 20150358590, which is hereby incorporated herein by reference.

It will be appreciated by those skilled in the art that changes could be made to the embodiments described above without departing from the broad inventive concept thereof. It is understood, therefore, that the invention disclosed herein is not limited to the particular embodiments disclosed, and is intended to cover modifications within the spirit and scope of the present invention.

**Reference Signs**

10, 10', 10''	rearview device
50, 50', 50''	base assembly
51, 51', 51''	base frame
52, 52'a, 52'b, 52''	base cover
53, 53', 53''	base cover
54, 54', 54''	gasket
55, 55', 55''	pivot seal
60, 60', 60''	head assembly
60a, 60'a	upper cover
60aa	attachment means
60b, 60'b	lower cover
60c, 60'c, 60''c	front cover
60''cc	opening
61	base assembly
61a	bayonet tower
62	camera
63	base cap
64	base cover
65	base frame
66	camera connector
67	gasket
70	articulation assembly
71a	upper cradle
71b	lower cradle
72	base frame
73	camera
74	camera cradle
75, 75', 75''	bezel
75á	opening
76a	upper casing element

76b	lower casing element
77	base assembly
78	lens
80	glass
81	indicator means
82	turn signal indicator module
85, 85'	camera unit
88, 88''	case frame
89	articulation assembly
89a, 89'a, 89''a	attachment means
90	motor cradle
91	motor opening
92	base seat
93a	tool opening
93b	tool opening
94a	opening
94b	opening
95	clamp element
96	sealing means
97	sealing means
100	vehicle

**Claims**

1. An external rearview device (10, 10', 10'') for a motor vehicle (100) comprising:
- a base assembly (61, 50, 50', 50'') provided for arrangement on the motor vehicle (100);
  - a head assembly (60, 60', 60'') configured to be attached to the base assembly (61, 50, 50', 50''); and
  - rearview means comprising at least one of a camera unit (85, 85') and a reflective element secured within the head assembly (60, 60', 60''),

wherein the head assembly (60, 60', 60'') is configured to be detachable and is selected from a set comprising

- a first head assembly (60) with a first rearview means comprising at least one reflective element, preferably in form of a mirror glass (80), and
- a second head assembly (60') with a second rearview means comprising at least one reflective element, preferably in form of an at least partly translucent mirror glass (80'), and a camera unit (85) being configured to obtain a rearview image through the reflective element, and
- a third head assembly (60'') with a third rearview means comprising a camera unit (85, 85') configured to obtain a rearview image through an opening.

2. The external rearview device of claim 1, wherein  
the first, second and third head assembly (60, 60', 60'') are exchangeable with each other,  
and/or  
the first, second and/or third head assembly (60, 60', 60'') is moveably attachable to the base assembly (61, 50, 50', 50''), and/or  
the base assembly (61, 50, 50', 50'') is fixed relative to the motor vehicle (100).

3. The external rearview device of claim 2, wherein  
the first and second head assembly (60, 60') are moveable and the third head assembly (60'') is fixed, and/or

each moveable had assembly comprises an articulation assembly (89), the articulation assembly comprising a fixed part attached to the fixed base assembly (61, 50, 50', 50'') and a moveable part attached to the head assembly (60, 60', 60'').

4. The external rearview device of any one of the preceding claims, further comprising a locking system with a locked state and an unlocked state, wherein the head assembly (60, 60', 60'') is removable from the base assembly (61, 50, 50', 50'') in the unlocked state and locked to the base assembly (61, 50, 50', 50'') in the locked state, with the locking system preferably being suited to be actuated by a driver of the vehicle to switch between the locked and the unlocked state, and vice versa, and/or with preferably actuating means of the locking system being suited to be actuated manually, electrically and/or via a remote device, such as a smart key or the like, and/or via a gesture and/or voice command.

5. The external rearview device of any one of the preceding claims, wherein a pivot joint system is provided between the base assembly (61) and the head assembly (60, 60', 60''), preferably comprising at least one spherical seat.

6. The external rearview device of any one of the preceding claims, further comprising a cradle (90), wherein

- the cradle (90) has a seat (92) adapted to be put on the base assembly (61) and to be attached by attaching a case frame (88) to the base assembly (61), and/or
- the cradle (90) is configured to attach to the base assembly (61) via the pivot joint system, and/or
- the cradle (90) comprises a recess or opening (91) for accommodating at least part of the articulation system, preferably an actuator system of the articulation system.

7. The external rearview device of claim 6, wherein the pivot joint system acts between the base assembly (61) and the case frame (88) and/or bayonet means (61a) fixedly attached to the case frame (88), and/or

the pivot joint system comprises a torsion spring, the torsion spring preferably having one end attached to the base assembly (61) and the other end attached to the case frame (88) and/or the bayonet means (61a).

8. The external rearview device of claim 6 or 7, wherein the cradle (90), in particular the seat (91) of the cradle (90), is arranged between two sealing means (96, 97) acting as pivot seals, with preferably one sealing means (97) being attached to the base assembly (61) and the other sealing means (96) being attached to the case frame (88), and/or with preferably each sealing means (96, 97) being a 2 component gasket with a hard part providing a clips function and a soft part compensating tolerances.

9. The rearview device of any one of the claims 6 to 8, wherein the seat (92) of the cradle (90) is a spherical seat, being concentrically to the axis of the pivot joint system.

10. The external rearview device of any one of the preceding claims, further comprising at least one functional module, comprising a further camera (62),

- a light module, in particular in form of a turn signal indicator module (82) and/or a blind spot indicator module (81),
- a display, in particular integrated in the head assembly and/or provided together with the reflective element,
- a Bluetooth module and/or
- a sensor module, in particular a temperature sensor.

11. The external rearview device of any one of the preceding claims, further comprising a camera connector (66), which is positioned in a non-moving area of the fixed base assembly or in a non-moving area of the moveable head assembly and receives the camera unit.

12. The external rearview device of any one of the preceding claims, wherein

the first, second and third head assembly (60, 60', 60'') each comprises an upper cover (60a, 60'' a) and a front cover (60c, 60'' c),

with preferably the first, second and/or third head assembly (60, 60', 60'') each comprising a lower cover (60b, 60'' b) for housing an internal structure, in particular comprising a case frame (88, 88') and/or the articulation assembly (89).

13. The external rearview device of claim 12, wherein

the upper covers (60a) and/or lower covers (60b) of the first and second head assemblies (60, 60') have the same structure, and/or

the front covers (60c) of the first and second head assemblies (60, 60') have the same structure, and/or

the front covers of the first, second and third head assemblies (60, 60', 60'') each comprise a bezel (75, 75', 75''), with the bezel (75') of the second head assembly (60') preferably having an opening (75'a) such that the camera unit (85) can obtain a rearview image through the reflective element and/or comprises the bezel (75'') of the third head assembly (60''), and/or the second head assembly comprises the third head assembly.

14. The external rearview device of claim 12 or 13, wherein

the case frame (88, 88') and/or the articulation assembly (89) is provided with attachment means (89a, 89'a, 89'' a) for the attachment of a fixed component or the camera unit (85, 85').

15. The external rearview device of any one of the preceding claims, wherein

the base assembly (61, 50, 50', 50'') is configured to receive the first, second or third head assembly (60, 60', 60'') via a head assembly interface, and/or

the base assembly (61, 50, 50', 50'') is selected from a plurality of different base assemblies, in particular comprising a sail mount base assembly (50), a waist mount base assembly (50') and a door mount base assembly (50''), and/or

the base assembly (61, 50, 50', 50'') is adapted to the motor vehicle (100).

16. The external rearview device of any one of the preceding claims, wherein

each base assembly (61, 50, 50', 50'') comprises a base frame (51, 51', 51''), one or more base covers (52, 52, 52'', 53, 53', 53''), a gasket (54, 54', 54'') and a pivot seal (55, 55', 55''), with preferably a bayonet tower (61a) extending into the head assembly interface.

17. The external rearview device of any one of the preceding claims, wherein the camera unit (85, 85') is suited to provide at least a field of view fulfilling the legal requirements and/or a field of view fulfilling outside the legal requirements, with preferably the camera unit of the third head assembly being suited to provide at least a field of view fulfilling the legal requirements and/or the camera unit of the second head assembly being suited to provide at least a field of view fulfilling the legal requirements and/or a field of view fulfilling outside the legal requirements.

18. An external rearview device kit suited to provide at least one external rearview device (10, 10', 10'') of any one of the preceding claims with at least one base assembly (61, 50, 50', 50'') and a first, second and third head assembly (60, 60', 60'').

19. The external rearview device kit of claim 18, wherein a plurality of base assemblies (61, 50, 50', 50'') is provided.

20. Vehicle with at least one rearview device (10, 10', 10''), according to any one of the claims 1 to 17.

1/10

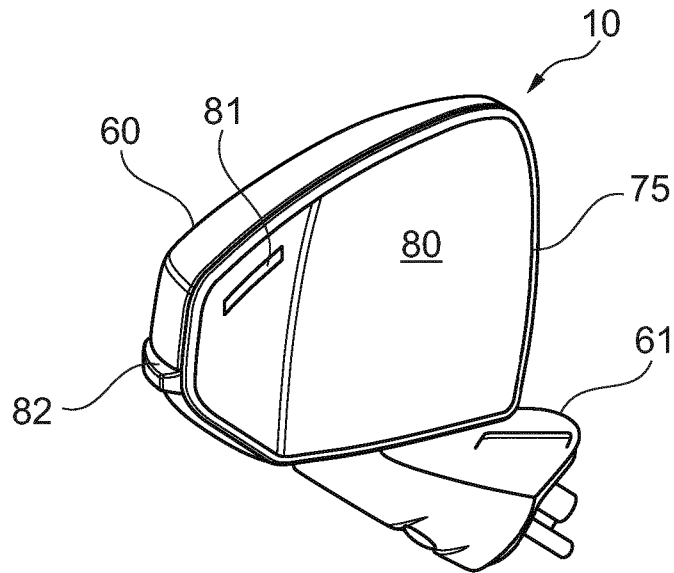


Fig. 1A

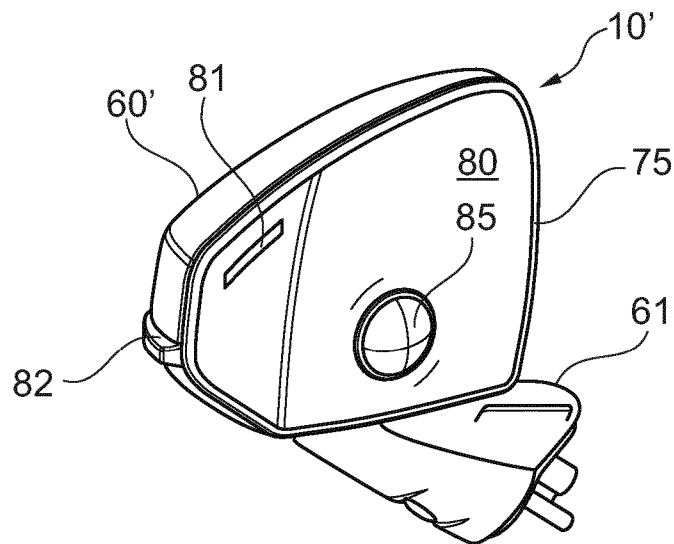


Fig. 1B

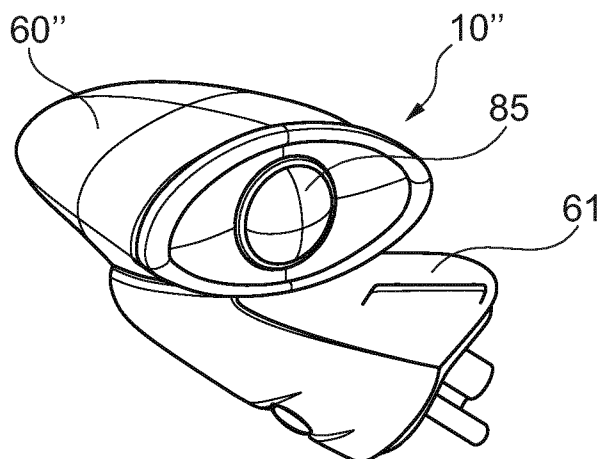


Fig. 1C

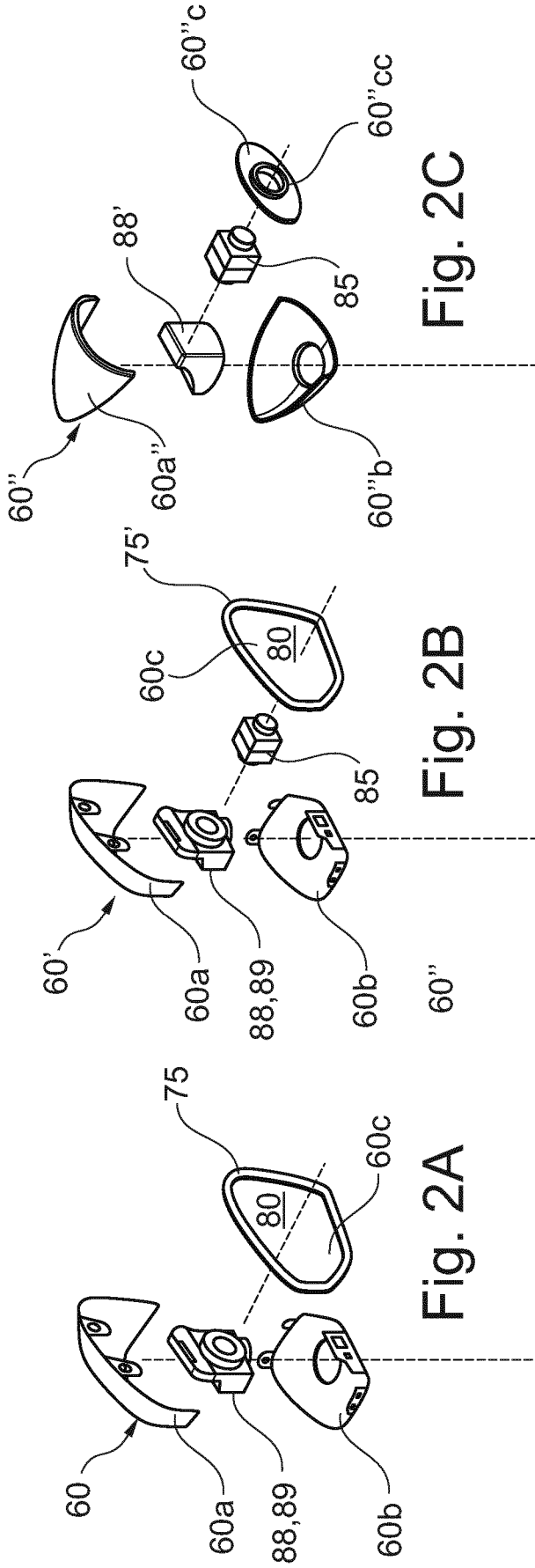


Fig. 2C

Fig. 2B

Fig. 2A

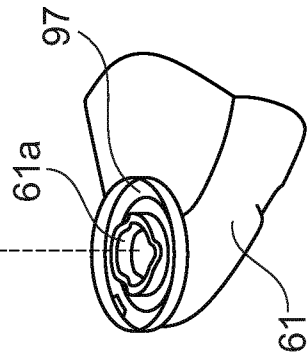


Fig. 2D

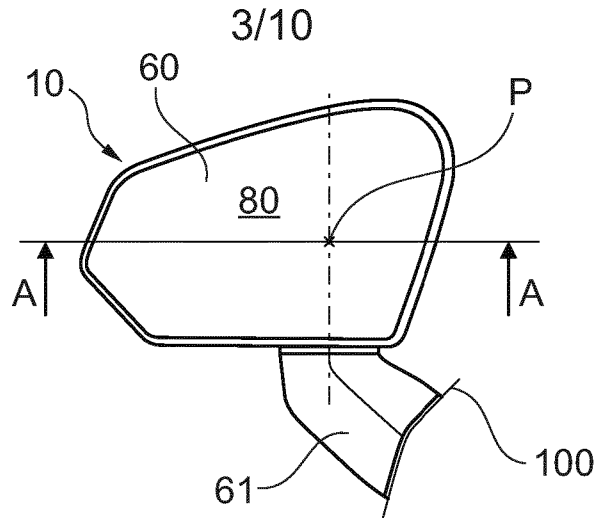


Fig. 3A

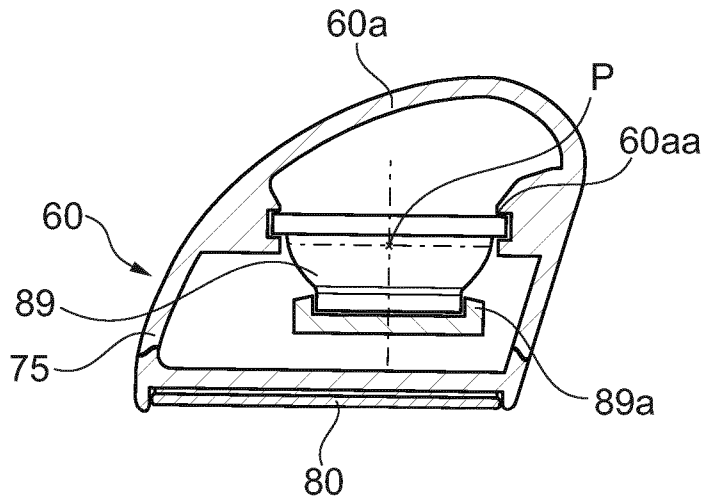


Fig. 3B

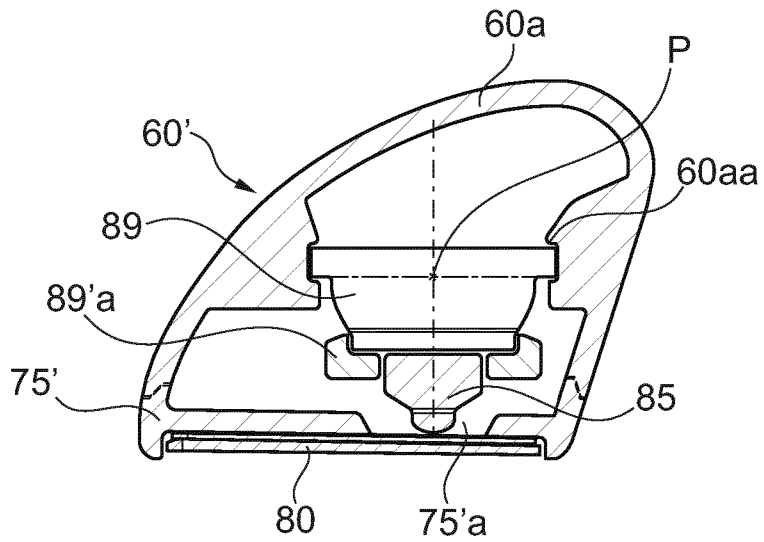


Fig. 3C

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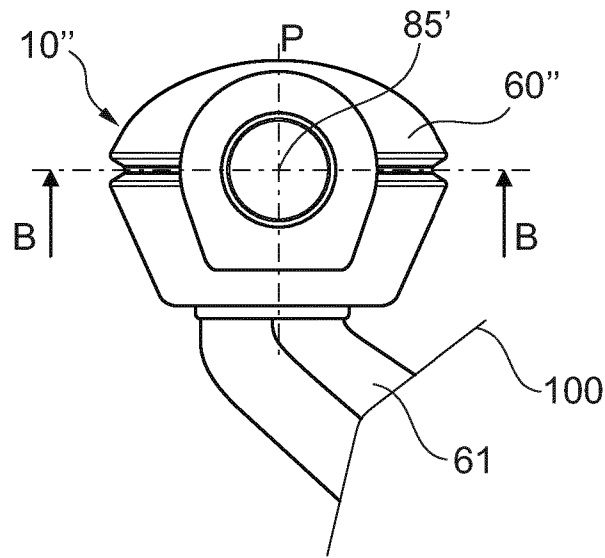


Fig. 3D

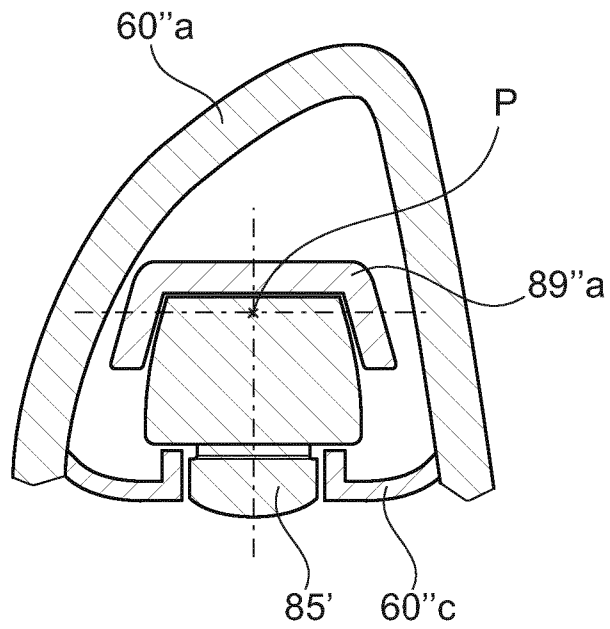


Fig. 3E

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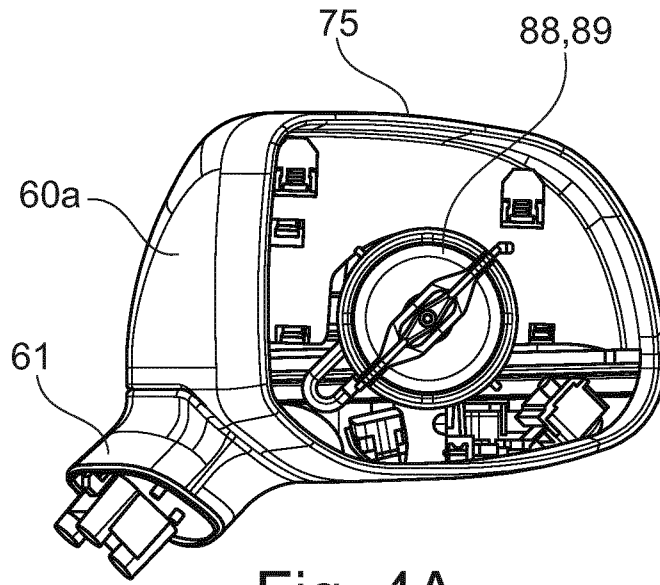


Fig. 4A

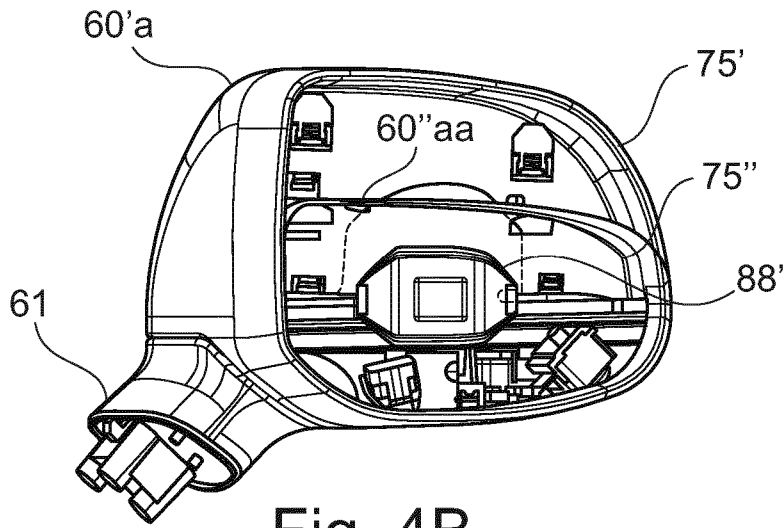


Fig. 4B

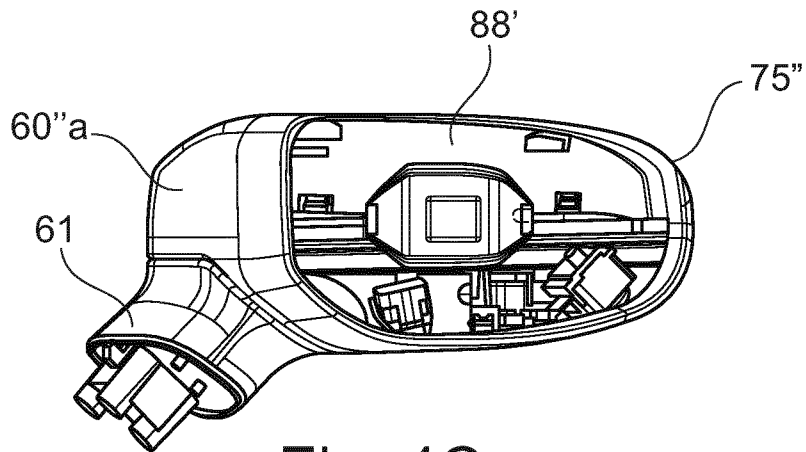


Fig. 4C

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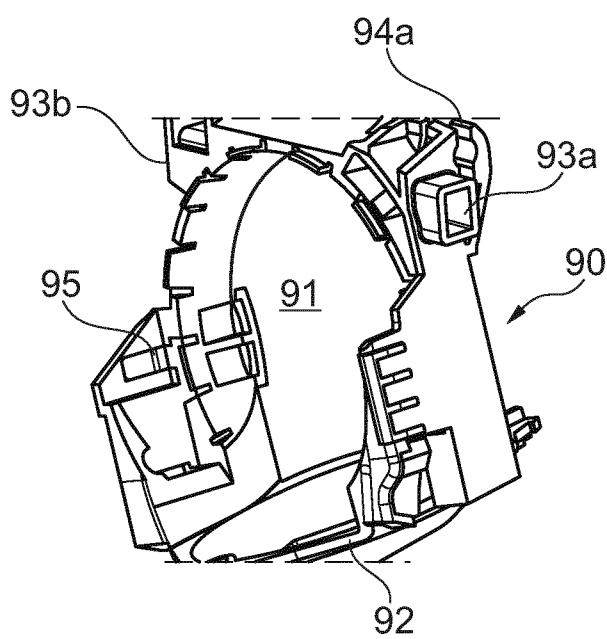


Fig. 5A

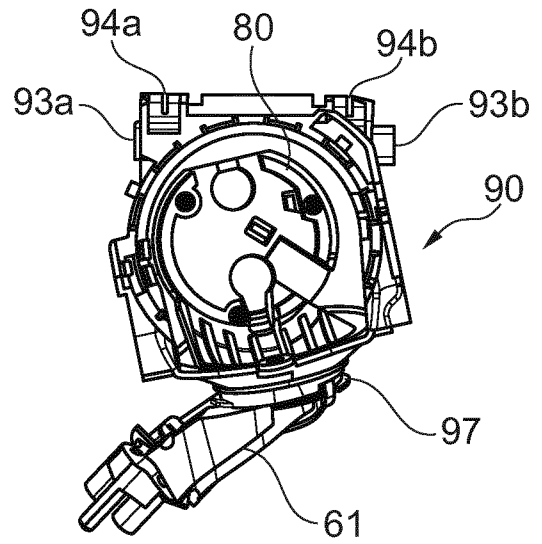


Fig. 5B

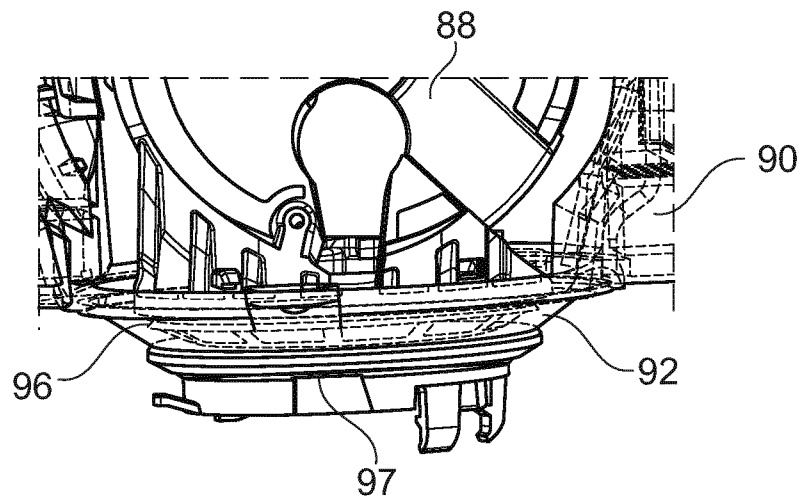


Fig. 5C

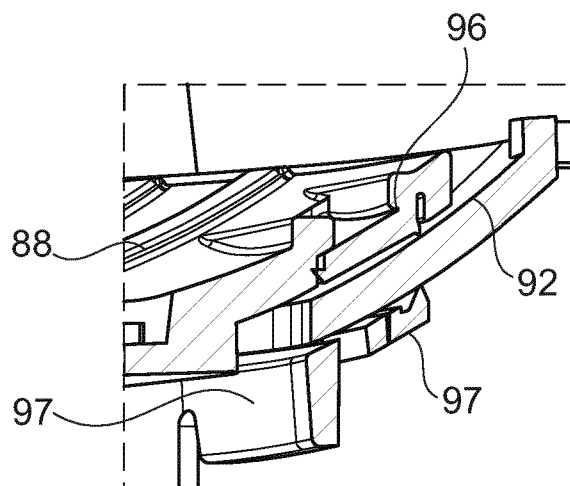


Fig. 5D  
SUBSTITUTE SHEET (RULE 26)

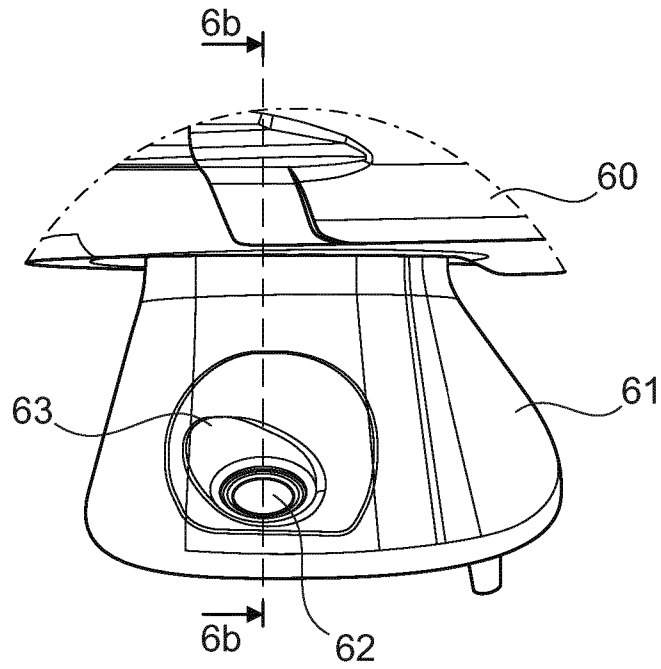


Fig. 6A

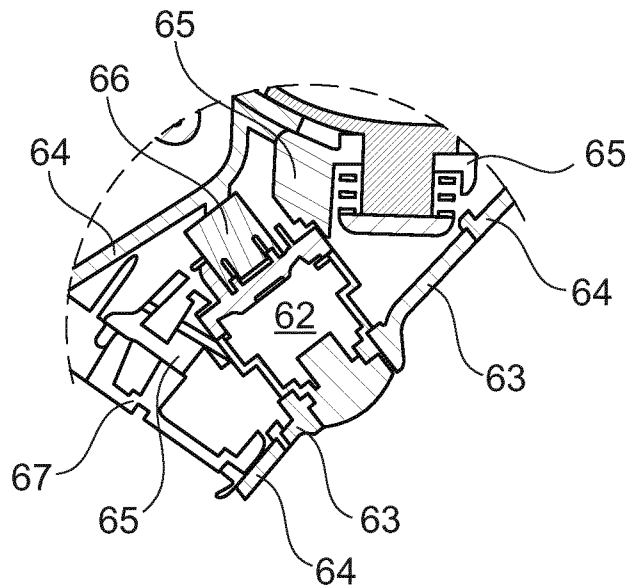


Fig. 6B

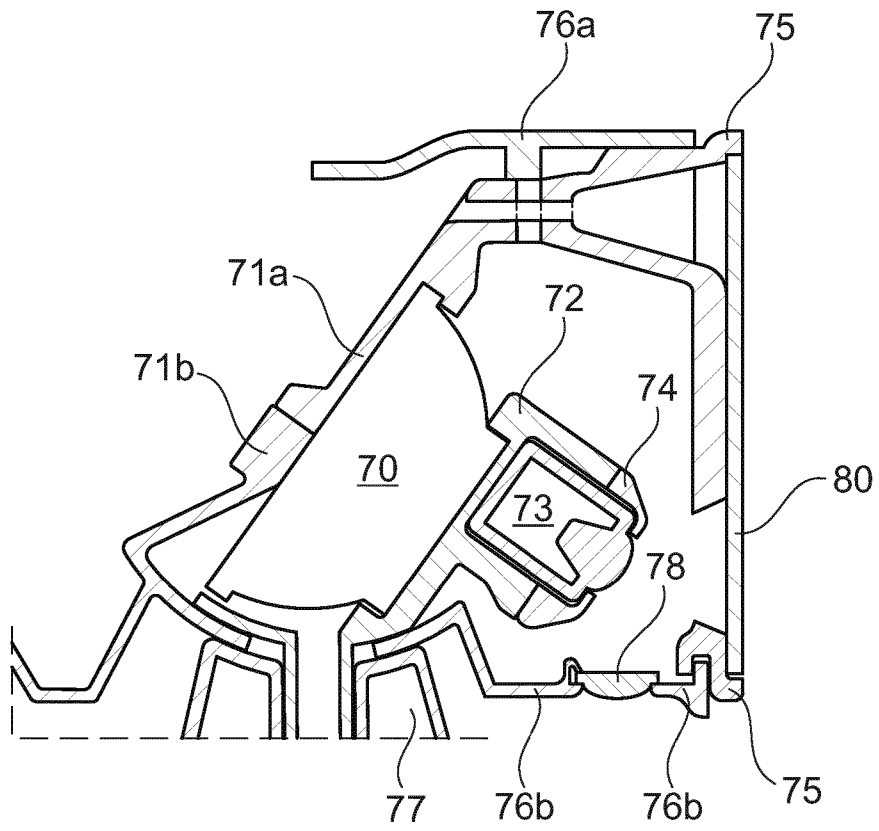


Fig. 7

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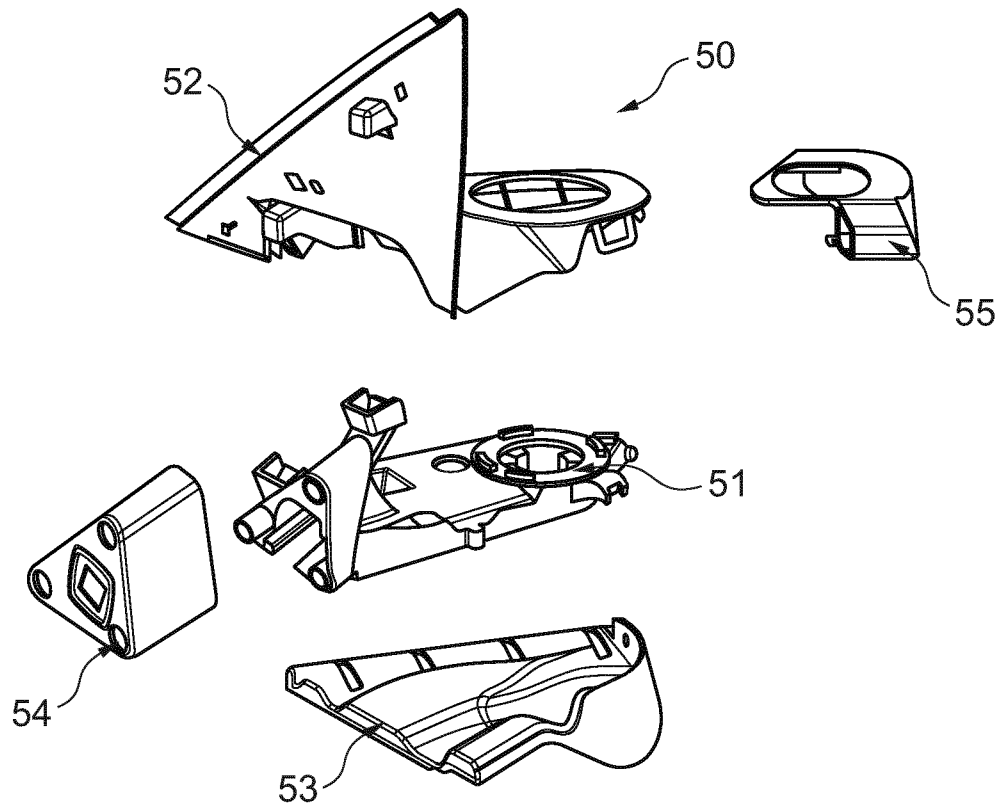


Fig. 8A

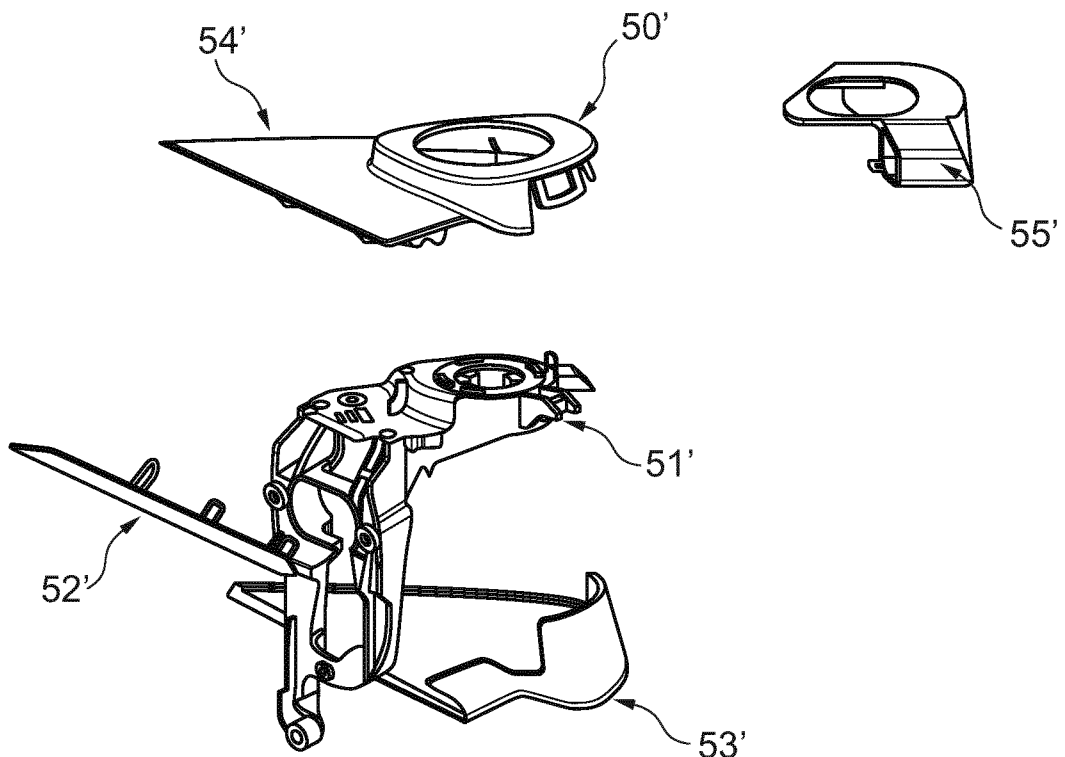


Fig. 8B

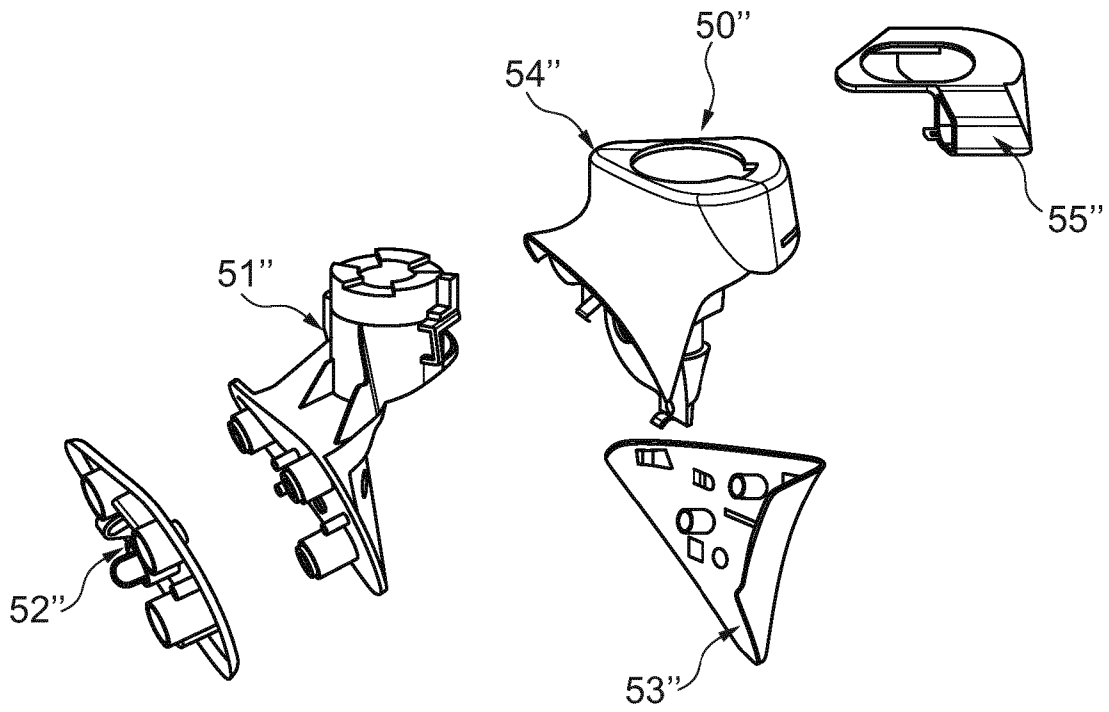


Fig. 8C

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/EP2018/079886

A. CLASSIFICATION OF SUBJECT MATTER  
INV. B60R1/06 B60R1/00 B60R11/04  
ADD.  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED  
Minimum documentation searched (classification system followed by classification symbols)  
B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 01/96149 A1 (SCHEFENACKER VISION SYSTEMS US [US]; REHILL GRAHAM [GB]) 20 December 2001 (2001-12-20) figure 1	1-20
X	----- JP 2014 061808 A (ICHIKOH INDUSTRIES LTD) 10 April 2014 (2014-04-10) paragraph [0023] - paragraph [0024]; figures 1-3	1-20
X	----- JP 2016 037109 A (SAKAE RIKEN KOGYO CO LTD) 22 March 2016 (2016-03-22) paragraph [0013]; figures 3-4	1-20
X	----- US 2015/138658 A1 (NISHIMURA EIICHI [JP] ET AL) 21 May 2015 (2015-05-21) figures 2,7,11	1,18,20

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p>
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Date of the actual completion of the international search <b>28 November 2018</b>	Date of mailing of the international search report <b>11/12/2018</b>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  <b>Wilson, Mark</b>
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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