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(54) **PLASTIC VEHICLE DOOR HANDLE ASSEMBLY AND ASSOCIATED PRODUCTION METHOD**

FAHRZEUGTÜRGRIFFANORDNUNG AUS KUNSTSTOFF UND ZUGEHÖRIGES
HERSTELLUNGSVERFAHREN

ENSEMBLE POIGNÉE DE PORTE EN PLASTIQUE POUR VÉHICULE ET PROCÉDÉ DE
FABRICATION ASSOCIÉ

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Description

OBJECT OF THE INVENTION

[0001] The object of the present invention is a plastic catch arrangement for vehicle doors and the associated manufacturing procedure in which in the axis zone of the plastic catch arrangement stresses do not accumulate as said axis only fulfils the function of positioning element of the catch.

[0002] In addition, the associated manufacturing procedure, by means of gas assisted injected moulding enables the aforementioned configuration to be obtained, in which the axis is not subjected to stresses and in which the catch is also provided with support surfaces in the casing which release stresses on the casing, thus preventing the axis from breaking the catch.

[0003] In addition, the procedure is completed with an electroplating stage using various metals on the part obtained in the gas assisted injection moulding stage, thus providing the arrangement with an external metallic appearance.

BACKGROUND TO THE INVENTION

[0004] In the state of the art, vehicle door catches are known which are made from metallic materials, preferentially by aluminium Zamac alloy injection moulding, as used in top range vehicles.

[0005] Furthermore, in lower range vehicles, injected plastic moulding materials are used in manufacturing door catch arrangements which are subsequently subjected to an electroplating process, thus reducing the final costs associated with the materials used in the vehicle.

[0006] The aforementioned arrangements manufactured by injection moulding are provided with a plastic housing with a catch that the user employs to open the vehicle door, in which the catch has a projection with a hole through which the axis passes in order to make the rotation. Such a door catch arrangement is known from US-4 343 501.

[0007] In the previous system, when the catch is in the fully opened position, the stresses concentrate on the zone connecting the axis to the catch, that is, in the zone of the projection with the hole, as the stress of retention on reaching the limit or fully opened position is supported by the axis, in addition to the concentration of stresses occurring in this zone due to activating the catch in order to open the vehicle door, which may cause it to break, as a result of frequent repetition of the operation of this type of catch.

[0008] It is therefore necessary to provide a plastic catch arrangement for vehicle doors in which there is no concentration of stresses in the zone where the axis passes through the catch, for which purpose the axis should only be a positioning element of the catch.

[0009] In order to achieve the foregoing, the catch should be inserted in the casing, so that there is no pro-

jection with a hole into which the axis is inserted, but rather various zones of the catch through which the axis passes. Conventional injection moulding does not permit a catch to be obtained with the aforementioned geometry due to the fact that the material would not reach the catch zones which surround the geometric position of the axis in the arrangement.

[0010] All the previous disadvantages have been overcome by the invention described herein as it provides a plastic catch arrangement for a vehicle which prevents the concentration of stresses in the axis zone, as the retention stress is not supported by the catch itself but instead by support surfaces of the catch in the casing and by zones where the catch is inserted in said casing.

DESCRIPTION OF THE INVENTION

[0011] The present invention refers to a plastic catch arrangement for a vehicle door and the associated manufacturing procedure where the catch axis acts solely as a positioning element thereof, preventing the concentration of stresses in said zone and thus breakage of the catch in the area of connection with the axis.

[0012] In addition, the catch is provided with support surfaces which rest, some during repose and others during full activation of the catch, on the casing, releasing stresses thereon and preventing breakage of the catch in the zone where the axis passes through it.

[0013] The catch is provided with a main body manufactured in a procedure to be described below, from which a zone connecting to the casing extends, and which remains self-centred therein, as this connection zone of the catch is antagonistic to the interior zone of the casing to which it is joined, comprising all the concave space of the carcass.

[0014] In this way, the catch is self-centred in the casing and it is not possible to move in an axial direction. This axial direction is defined as that in which an axis passes through both the connection zone of the catch and the casing, and the casing itself, where the axis only serves to position the catch with respect to the casing in its different positions during the rotation of the catch.

[0015] An elastic element is situated in a groove of the catch connection zone and external to the axis, which permits the catch to recover its resting position following activation.

[0016] In this way, during assembly, the catch is self-centred with respect to the casing and the axis is not required to support the stresses when the catch is in the fully opened position, or those stresses caused by the force of activation of the catch, as the aforementioned stresses are transmitted to the casing by the support zones of the catch.

[0017] The associated manufacturing process consists of an initial gas assisted injection moulding stage in which the gas displaces the plastic material of the catch towards the volume of the mould cavity, which as yet has not been filled, leaving in its place an internal channel

without any plastic material formed by the gas flow.

[0018] In this way, the plastic material is forced to all the walls of the mould and thus improves the surface finish of the injected catch.

[0019] Due to the fact that the axis simply comprises a positioning element of the catch, said catch is required to occupy the casing cavities, and in turn the casing occupies the cavities of the catch for adequate self-centring of the casing catch.

[0020] In this way, the surfaces of both the catch and the casing through which the axis passes are adjacent, enabling the axis to position the catch with respect to the casing in the various positions during rotation of the catch.

[0021] Using gas assisted injection moulding, the plastic material reaches the extensions of the zone connecting the catch to the casing which are situated in the cavities of said carcase.

[0022] As a second stage of the manufacturing procedure, an electroplating process using various metals is applied to the part obtained in the gas assisted injection moulding stage, which provides the arrangement with an external metallic appearance.

[0023] In this way a lightweight catch arrangement is obtained, due to the fact that it is hollow internally as a result of the procedure used, in which the injection lines of the flow of the plastic material on the visible face are removed as it is possible to maintain the internal pressure of the gas in the mould cavity during the process.

DESCRIPTION OF THE DRAWINGS

[0024] The present descriptive report is supplemented by a series of drawings, illustrative of a preferred embodiment but not, however, restricting the invention in any way.

Figure 1 shows an elevated view of the plastic catch for vehicle doors which is the object of this invention in resting position.

Figure 2 shows a cross section of the lower view of the plastic catch for vehicle doors shown in Figure 1.

Figure 3 shows a cross section of the lower view of the plastic catch for vehicle doors in activated position.

Figure 4 shows a cross section perspective view of the plastic catch for vehicle doors indicating the catch connection with the casing, in addition to the axis and the elastic element which permits the catch's return to resting position.

Figure 5 shows a perspective exploded view of the casing and the catch which is the object of the invention, in which the catch has turned 180° in order to show its interior which is self-centred in the casing

during mounting.

PREFERRED EMBODIMENT OF THE INVENTION

[0025] In the light of the aforementioned description, the present invention refers to a plastic catch arrangement for vehicle doors and an associated manufacturing procedure, with the arrangement in this example of a preferred embodiment being of the type situated in the interior of a vehicle door.

[0026] The plastic catch arrangement for vehicle doors consists of a casing (1) on which a catch (2) is self-centred due to the fact that the catch (2) geometry is antagonistic to the concave side of the casing (1) in the zone where both parts (1,2) are connected.

[0027] This antagonistic geometry of both parts (1, 2) is such that the catch (2) is provided with a cavity (2.1) antagonistic to a projection (1.1) of the casing(1). Therefore, the space between each of the two walls (1.1.1) of said projection (1.1) of the casing(1) and the lower and upper concave walls (1.2, 1.3) of the casing(1) are occupied by the catch(2), achieving the self-centring thereof (2) in the casing (1).

[0028] Both the catch (2) and the projection (1.1) of the casing (1) in the connection zone of both (1, 2) are provided with a hole (1.4, 2.2) which is present throughout the height of the arrangement in the connection zone. This hole (1.4, 2.2) runs from the lower concave wall (1.2) of the casing (1) to the upper concave wall (1.3) thereof (1), permitting connection of an axis (3) which positions the catch (2) with respect to the casing (1) in the various positions of the catch (2) during rotation.

[0029] There is a widening (2.3) of the hole (2.2) in the zone of the catch (2) which houses an elastic element (4) which enables the catch (2) to recover its resting position following activation.

[0030] In addition the catch (2) is provided with first (2.4) and second (2.5) support surfaces. The first support surface (2.4) rests on the casing (1) when the catch (2) is not activated whereas the second support surfaces (2.5) rest on the casing (1) when the catch (2) is in the fully activated position, releasing the stresses on the casing (1) and preventing breaking of the catch (2) in the area where the axis (3) passes through the catch (2).

[0031] The manufacturing process of the plastic catch arrangement for vehicle doors consists of an initial gas assisted injection moulding stage in which the gas displaces the plastic material of the catch towards the volume of the mould cavity, which as yet has not been filled, leaving in its place an internal channel (2.6) without any plastic material formed by the gas flow.

[0032] This internal channel (2.6) created in the catch interior has the form of an oval shaped bubble with constant dimensions, with no visible injection lines from the flow of plastic material on the catch (2) as it is possible to maintain the internal pressure of the gas during the procedure so that the plastic material reaches all the walls of the mould.

[0033] The plastic materials used in manufacturing the catch are thermoplastic resins such as acrylonitril butadiene styrene ABS, acrylonitril butadiene styrene alloy with polycarbonate ABS/PC, polyamide PA or polypropylene PP.

[0034] Use of gas assisted injection moulding ensures that the plastic material reaches the projections (2.7) among which the cavity (2.1) of the catch (2) is defined.

[0035] As a second stage of the manufacturing procedure, an electroplating process using various metals is applied to the plastic material of the catch (2), which is the part obtained in the gas assisted injection moulding stage thus providing the arrangement with an external metallic appearance. These metals are Pd, Cu, Ni y Cr, and provide the match (2) with either a shiny or matt external appearance.

[0036] The third and final stage of the manufacturing procedure of the plastic catch for vehicle doors consists of assembly of the different components of the arrangement, namely casing (1), catch (2), axis (3) and elastic element (4).

[0037] The essential nature of this invention is not altered in any way by variations in materials, form, shape and arrangement of the component elements which are described in a manner which is in no way restrictive but which is sufficient for an expert to proceed to its reproduction.

Claims

1. Plastic catch arrangement for vehicle doors of the type provided with a casing (1) and a catch (2) which is joined to the casing (1) by means of an axis (3) which is provided with an elastic element (4) which permits the catch (2) to return to its resting position following activation, **characterised in that** the catch (2) is self-centred on the casing (1) due to the fact that the geometry of the catch(2) is antagonistic to the concave side of the casing (1) in the zone where both (1,2) are connected, as the catch (2) is provided with a cavity (2.1) antagonistic to a projection (1.1) of the casing(1).
2. Plastic catch arrangement for vehicle doors according to claim 1 **characterised in that** the space between each of the two walls (1.1.1) of said projection (1.1) of the casing (1) and the lower and upper concave walls (1.2, 1.3) of the casing (1) is occupied by the catch (2).
3. Plastic catch arrangement for vehicle doors according to claim 2 **characterised in that** both the catch (2) and the projection (1.1) of the casing (1) in the area of connection of both (1,2) are provided with a hole (1.4, 2.2) which passes through the whole height of the arrangement in the connection area from the lower concave wall (1.2) of the casing to

the upper concave wall (1.3) thereof (1), permitting connection of the axis (3) which positions the catch (2) in respect of the casing (1) in the different positions during rotation of the catch (2).

4. Plastic catch arrangement for vehicle doors according to claim 3 **characterised in that** there is a widening (2.3) of the hole (2.2) in the zone of the catch (2) which houses an elastic element (4) which enables the catch (2) to recover its resting position following activation.
5. Plastic catch arrangement for vehicle doors according to claim 1 **characterised in that** the catch (2) is provided with first (2.4) and second (2,5) support surfaces in the casing (1) releasing the stresses thereon (1) and preventing the catch (2) from breaking.
6. Plastic catch arrangement for vehicle doors according to claim 5 **characterised in that** the first support surface (2.4) rests on the casing (1) when the catch (2) is not activated, whereas the second support surfaces (2.5) rest on the casing (1) when the catch (2) is in the fully activated position.
7. Manufacturing procedure of the plastic catch arrangement for vehicle doors according to the previous claims **characterised in that**
 - It consists of an initial gas assisted injection moulding stage,
 - A second electroplating stage using various metals on the part obtained in the first stage, and
 - A third stage of assembly of the various parts of the arrangement, namely casing (1) catch (2), axis (3), and elastic element (4).
8. Manufacturing procedure of the plastic catch arrangement for vehicle doors according to claim 7 **characterised in that** in the initial stage the gas displaces the plastic material of the catch (2) towards the volume of the mould cavity, which as yet has not been filled, leaving in its place an internal channel (2.6) without any plastic material formed by the gas flow.
9. Manufacturing procedure of the plastic catch arrangement for vehicle doors according to claim 8 **characterised in that** the internal channel (2.6) created in the interior of the catch is an oval shaped bubble with constant dimensions.
10. Manufacturing procedure of the plastic catch arrangement for vehicle doors according to claim 8, **characterised in that** the first stage does not leave any connection lines from the injection flow on the visible face of the catch (2).

11. Manufacturing procedure of the plastic catch arrangement for vehicle doors according to claim 7 **characterised in that** the materials used in the first stage of manufacturing the catch (2) are thermoplastic resins such as acrylonitril butadiene styrene ABS, acrylonitril butadiene styrene alloy with polycarbonate ABS/PC, polyamide PA or polypropylene PP.
12. Manufacturing procedure of the plastic catch arrangement for vehicle doors according to claim 7, **characterised in that** the metals used in the second stage and which provide the arrangement with a metallic external appearance are Pd, Cu, Ni and Cr.
13. Manufacturing procedure of the plastic catch arrangement for vehicle doors, according to claim 7 **characterised in that** the metals provide the catch with a shiny or matt appearance.

Patentansprüche

1. Ein Set Fahrzeugtürgriff aus Plastik mit einem Gehäuse (1) und einem Griff (2), der über eine Achse (3) mit einem elastischen Element (4), das nach Betätigung den Rücklauf des Griffs (2) in die Ruhestellung ermöglicht, mit einem Gehäuse (1) verbunden ist. Der Set zeichnet sich **dadurch** aus, dass sich der Griff (2), da er wegen seiner Geometrie auf der konkaven Seite des Gehäuses (1), wo beide (1,2) vereint sind, auf Grund dessen, dass der Griff (2) eine Vertiefung (2.1) aufweist, die ihrerseits einem überstehenden Ende (1.1) des Gehäuses (1) entgegengesetzt ist, entgegengesetzt ist, auf das Gehäuse (1) selbstzentriert.
2. Ein Set Fahrzeugtürgriff aus Plastik gemäß Forderung 1, das sich **dadurch** auszeichnet, dass der Freiraum zwischen den beiden Wänden (1.1.1) des besagten überstehenden Endes (1.1) des Gehäuses (1) und den unteren und oberen konkaven Wänden (1.2, 1.3) des Gehäuses (1) von dem Griff (2) besetzt ist.
3. Ein Set Fahrzeugtürgriff aus Plastik gemäß Forderung 2, das sich **dadurch** auszeichnet, dass sowohl der Griff (2) als auch das überstehende Ende (1.1) des Gehäuses (1) im beiderseitigen (1, 2) Verbindungsbereich über die gesamte Höhe des Sets von der unteren konkaven Wand (1.2) des Gehäuses (1) bis zur oberen konkaven Wand (1.3) des Gehäuses (1) eine Öffnung (1.4, 2.2) aufweist, durch die die Achse (3), die den Griff (2) hinsichtlich des Gehäuses (1) bei Betätigung des Griffs (2) in den unterschiedlichen Positionen hält, verbunden werden kann.
4. Ein Set Fahrzeugtürgriff aus Plastik gemäß Forde-

5 rung 3, das sich **dadurch** auszeichnet, dass die Öffnung (2.2) im Bereich des Griffs (2) eine Ausweitung (2.3) aufweist, wo sich das elastische Element (4) befindet, das nach Betätigung den Rücklauf des Griffs (2) in die Ruhestellung ermöglicht.

5. Ein Set Fahrzeugtürgriff aus Plastik gemäß Forderung 1, das sich **dadurch** auszeichnet, dass der Griff (2) am Gehäuse (1) eine erste (2.4) und eine zweite Stützfläche (2.5) aufweist, durch die die Kraft auf das Gehäuse (1) abgefangen wird und der Bruch des Griffs (2) verhindert wird.

6. Ein Set Fahrzeugtürgriff aus Plastik gemäß Forderung 5, das sich **dadurch** auszeichnet, dass die erste Stützfläche (2.4) auf dem Gehäuse (1) aufliegt, wenn der Griff (2) nicht betätigt ist, während die zweite Stützfläche (2.5) auf dem Gehäuse (1) aufliegt, wenn der Griff (2) vollständig betätigt ist.

7. Fabrikationsverfahren des Sets Fahrzeugtürgriff aus Plastik gemäß den vorhergehenden Forderung, das sich **dadurch** auszeichnet, dass

- es eine erste durch Gas unterstützte Spritzgussetappe durchläuft;
- es eine zweite Galvanisierungsetappe unterschiedlicher Metalle auf dem in der ersten Etappe erhaltenen Stück durchläuft;
- es eine dritte Montageetappe der unterschiedlichen Komponenten des Sets [Gehäuse (1), Griff (2), Achse (3) und elastisches Element (4)] durchläuft.

8. Fabrikationsverfahren des Sets Fahrzeugtürgriff aus Plastik gemäß der Forderung 7, das sich **dadurch** auszeichnet, dass in der ersten Etappe das Plastikmaterial des Griffs (2) durch das Gas zur Aushöhlung der noch nicht ausgefüllten Gussform verschoben wird, so dass an der Stelle durch den Gasfluss ein Plastik freier Kanal im Innenbereich (2.6) entstand.

9. Fabrikationsverfahren des Sets Fahrzeugtürgriff aus Plastik gemäß der Forderung 8, das sich **dadurch** auszeichnet, dass der Kanal im Innenbereich (2.6), der im Inneren des Griffs entstanden ist, eine ovale Blase von konstanter Größe aufweist.

10. Fabrikationsverfahren des Sets Fahrzeugtürgriff aus Plastik gemäß der Forderung 8, das sich **dadurch** auszeichnet, dass die erste Etappe keine Verbindungslinien des Injektionsflusses am sichtbaren Teil des Griffs (2) hinterlässt.

11. Fabrikationsverfahren des Sets Fahrzeugtürgriff aus Plastik gemäß der Forderung 7, das sich **dadurch** auszeichnet, dass es sich bei den in der ersten Etappe der Fabrikation des Griffs (2) verwendeten Mate-

rialien um thermoplastisches Harz wie Acrylnitril-Butadien-Styrol (ABS), Acrylnitril-Butadien-Styrol Legierung mit Polycarbonat (ABS / PC), Polyamid (PA) oder Polypropylen (PP) handelt.

12. Fabrikationsverfahren des Sets Fahrzeugtürgriff aus Plastik gemäß der Forderung 7, das sich **dadurch** auszeichnet, dass es sich bei den in der zweiten Etappe verwendeten Metallen, die dem Set zudem das äußere metallische Aussehen verleihen, um Pd, Cu, Ni und Cr handelt.
13. Fabrikationsverfahren des Sets Fahrzeugtürgriff aus Plastik gemäß der Forderung 7, **gekennzeichnet dadurch, dass** das festhaltende Material dank des Metalle glänzend oder matt aussieht.

Revendications

1. Dispositif de gâche en plastique pour les portes des véhicules comprenant un boîtier (1) et une gâche (2), ladite gâche étant attachée au boîtier 1 à l'aide d'un axe (3) qui a un élément élastique (4) qui permet à la gâche (2) de retourner à sa position de repos après l'activation, ledit dispositif étant **caractérisé par le fait que** la gâche (2) est centrée sur le boîtier (1) grâce à sa géométrie qui est opposée à la géométrie de la partie concave du boîtier (1) dans la zone où le boîtier (1) et la gâche (2) sont connectés, la gâche (2) étant pourvue d'une cavité (2.1) capable de recevoir une projection (1.1) du boîtier (1).
2. Le dispositif de gâche en plastique pour les portes des véhicules selon la revendication no 1 est **caractérisé par le fait que** l'espace entre chacun des deux murs (1.1.1) de la projection mentionnée (1.1) du boîtier (1) et des murs supérieurs et inférieurs concaves (1.2,1.3) du boîtier (1) est occupé par le gâche(2).
3. Le dispositif de gâche en plastique pour les portes des véhicules selon la revendication 2 **caractérisé par le fait que** tantôt le gâche (2) que la projection (1.1) du boîtier (1) de la zone de connexion des deux (1, 2) dispose d'un trou (1.4, 2.2) qui traverse toute la hauteur du dispositif de la zone de connectivité du mur inférieur concave (1.2) du boîtier du mur supérieur concave (1.3) de celui-ci (1), ce qui permet la connexion de l'axe (3) qui emplace la gâche(2) face à la boîtier (1) dans des positions diverses pendant la rotation de la gâche(2).
4. Le dispositif de gâche en plastique pour les portes des véhicules selon la revendication 3 est **caractérisé par le fait que** le trou (2.2) s'élargit (2.3) dans la zone de la gâche (2) qui abrite un élément élastique (4) qui permet à la gâche (2) de reprendre

sa position initiale après son activation.

5. Le dispositif de gâche en plastique pour les portes des véhicules selon la revendication 1 est **caractérisé par le fait que** la gâche(2) a une première (2.4) superficie support et une deuxième (2.5) superficie support dans le boîtier (1) qui relâche les stress de ceux-ci (1) et prévient que la gâche (2) ne se casse.
6. Le dispositif de gâche en plastique pour les portes des véhicules selon la revendication 5 est **caractérisé par le fait que** la première superficie de support (2.4) se repose sur le boîtier (1) lorsque la gâche(2) n'est pas active, tandis que la deuxième superficie de support (2.5) repose sur le boîtier (1) lorsque la gâche(2) se trouve dans la position active maximale.
7. La procédure de manufacture du dispositif de gâche en plastique pour les portes des véhicules a les suivantes caractéristiques selon les amendements précédents :
 - Est formé d'une étape d'injection initiale de gaz assistée
 - Une étape seconde d'électroplaque qui utilise de différents métaux sur la partie obtenue de la première étape, et
 - Une troisième étape de l'ensemble de différentes parties de l'arrangement, c'est-à-dire la boîtier (1), le gâche(2), l'axe (3) et un élément en plastique (4).
8. La procédure de manufacture du dispositif de gâche en plastique pour les portes des véhicules selon la revendication 7 est **caractérisée par le fait que** dans l'étape initiale le gaz déplace le matériel en plastique de la gâche (2) envers le volume de la cavité qui n'a pas été remplis jusqu'à maintenant, ce qui fait qu'à sa place reste un canal interne (2.6) sans matériel plastique formé par le cours de gaz.
9. La procédure de manufacture du dispositif de gâche en plastique pour les portes des véhicules selon la revendication 7 est **caractérisée par le fait que** le canal central (2.6) créé à l'intérieur de gâche est un ovale de la forme d'une boule avec des dimensions constantes.
10. La procédure de manufacture du dispositif de gâche en plastique pour les portes des véhicules selon la revendication 7 est **caractérisée par le fait que** la première étape ne garde aucune ligne de connexion du cours d'injection sur la superficie visible de gâche (2).
11. La procédure de manufacture du dispositif de gâche en plastique pour les portes des véhicules selon la revendication 7 est **caractérisée par le fait que**

les matériaux utilisés dans la première étape de manufacture de la gâche (2) sont des résines en thermoplastique comme l'acrylonitrile butadiène styrène ABS, l'alliage d'acrylonitrile butadiène styrène avec du polycarbonate ABS/PC, polyamide PA ou polypropylène PP. 5

12. La procédure de manufacture du dispositif de gâche en plastique pour les portes des véhicules selon la revendication 7 est **caractérisée par le fait que** les métaux utilisés dans la deuxième étape et qui donnent à l'ensemble une apparence extérieure métallique est de Pd, Cu, Ni et Cr. 10

13. La procédure de manufacture du dispositif de gâche en plastique pour les portes des véhicules selon la revendication 7 est **caractérisée par le fait que** les métaux donnent à la gâche une apparence soit brillante soit mate. 15

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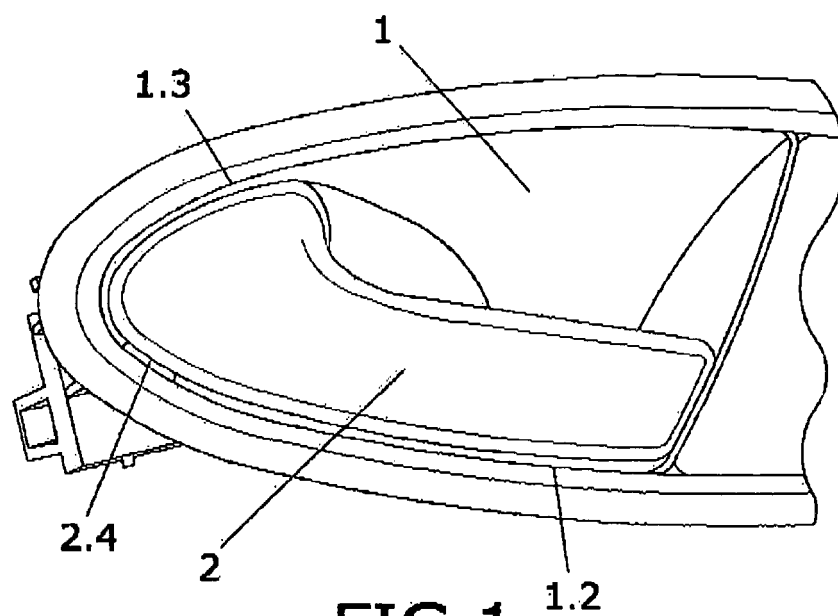


FIG.1

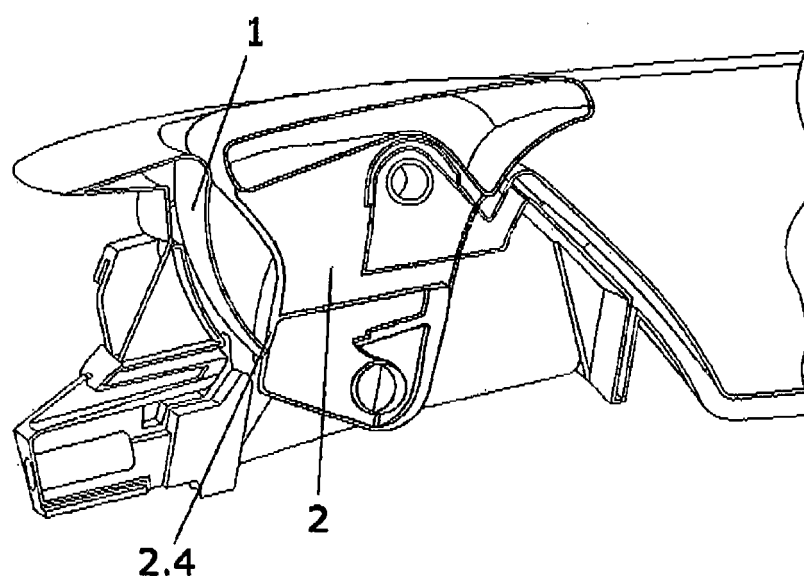


FIG.2

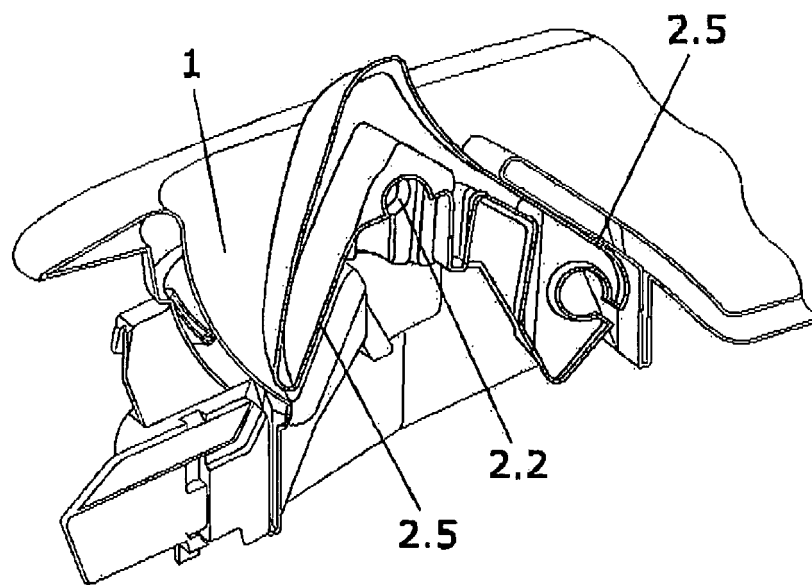


FIG.3

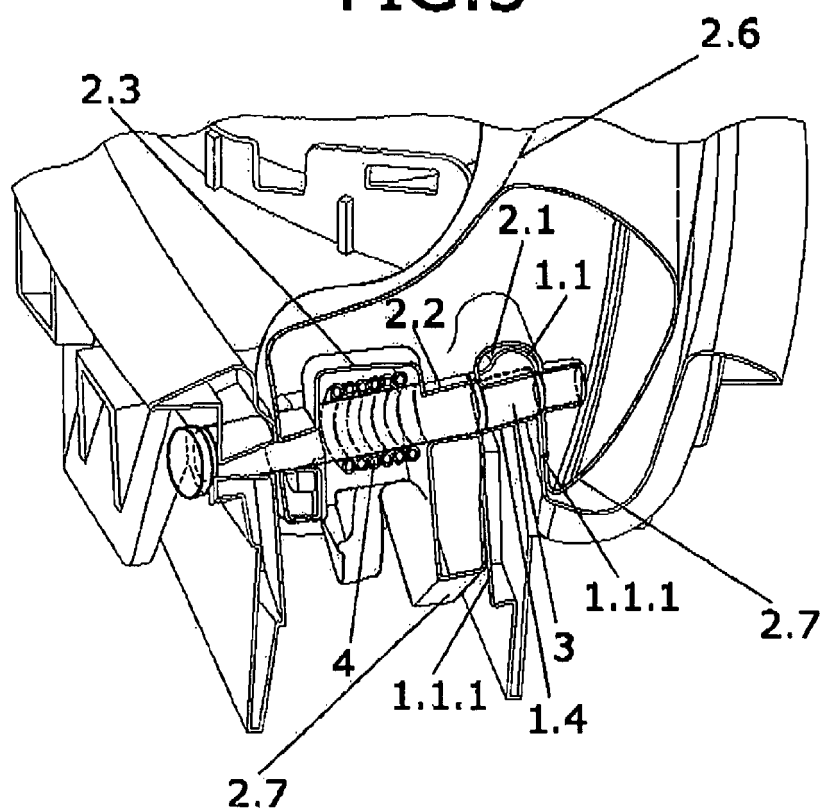
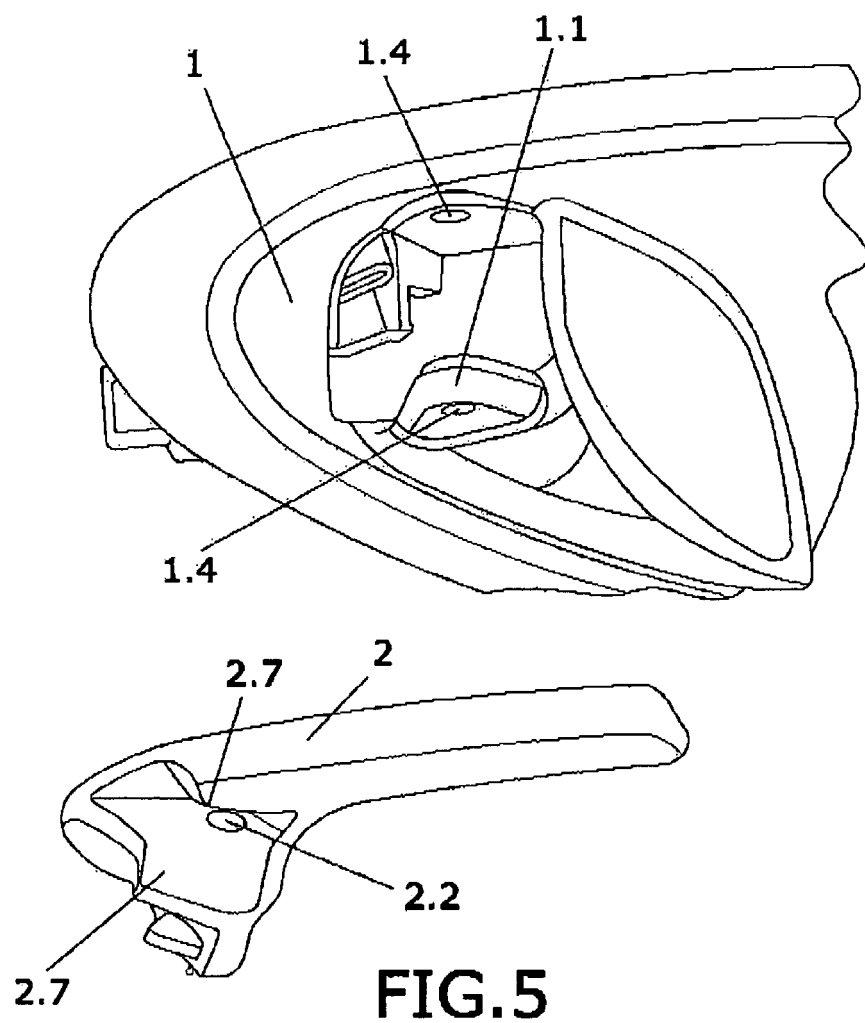


FIG.4



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 4343501 A [0006]