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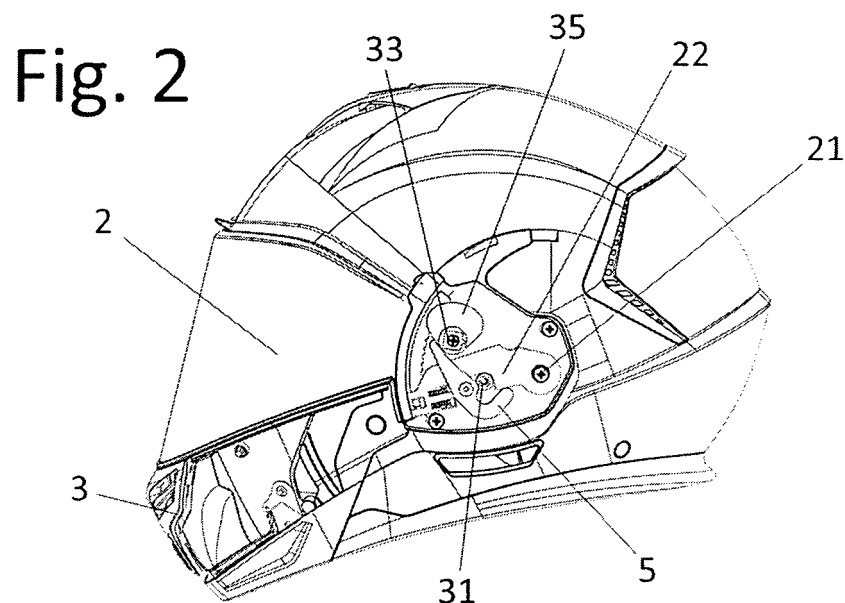
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(54) **HELMET WITH CHIN GUARD**

(57) Helmet with chin guard, comprising a helmet body (1) with a front opening (11) for the user's face, a transparent visor (2) and a chin guard (3) mobile between a frontal position in front of the opening (11) and a withdrawn position. The visor is articulated to the body

through an arm (23) and a first axis (21). The arm (22) is pushed apart by a lever (5) affected by a cam (35) that rotates with the chin guard (3). Therefore, the movement of the chin guard (3) is followed by the visor (2) both at the beginning and the end of its movement.



Description

Technical field

[0001] The present application refers to a helmet, of the type commonly used for riding motorcycles, with a folding or collapsing chin guard. It presents a layout that allows the chin guard to be moved towards the rear with greater smoothness and precision while maintaining efficiency in the event of an accident.

State of the art

[0002] The existence of helmets with a visor is known in the state of the art. E.g., those used in competition. These helmets have a helmet body, arranged around the head, and a transparent visor or front. This transparent visor is often movable to allow the user to talk, eat or do other activities without removing the helmet.

[0003] The existence of helmets that can also move the chin guard is also known. Some examples can be seen in EP1101419A1, EP2976957A1 or ES2359494T3.

[0004] The problem arises when you want to make the movement of the chin rest fluid and without the need to manually act on the visor. For the helmet to be reasonably airtight and for air not to enter the face through the gap between the chin guard and the visor, the latter rests on the chin guard. Therefore, the movement of the chin guard must comprise a first movement to misalign both elements. This movement implies that the helmet has a possible point of structural failure in the event of an accident, making it less safe than desirable. In addition, the chin guard must protrude from the visor in all directions, so the aerodynamic shape is less than optimal.

[0005] Moreover, most movable chin guards require an exact position of the visor in order to be foldable.

[0006] The applicant is not aware of any system that makes it possible to solve all these problems as efficiently as the invention.

Summary of the invention

[0007] The invention consists of a helmet with a chin guard according to the independent claims and whose variants solve the problems of the state of the art.

[0008] The chin guard helmet comprises a helmet body with a front opening for the wearer's face, a transparent visor or screen and a chin guard. The visor and chin guard are movable between a forward position in front of the opening and a position where they are withdrawn.

[0009] The visor is articulated to the body by a first axis from which an arm connecting to the visor emerges. For its part, the chin guard has a slot through which a projection attached to the body slides. This projection is closer to the opening than the first axis. The chin guard is articulated to a crank finished in a second axis that includes a cam attached to the crank. The second axis lies above the first axis and closer to the opening than the

projection.

[0010] The mechanism also comprises a lever below the connecting crank and the arm. The ends of the lever are supported by the cam and the arm. The dimensions and shape of the cam are designed so that it releases the lever, that is, not pushes it, when the chin guard is in the extreme positions. In return, the cam impinges on the lever in any other position of the chin guard, raising the arm and, thus, the visor.

[0011] Other variants are appreciated in the rest of the specification.

Description of the drawings

[0012] For a better understanding of the invention, the following figures are included, showing exemplary embodiments.

Figure 1: View of an exemplary embodiment.

Figure 2: Starting position of the chin guard and the visor, showing the position of the cam, the lever and the arm.

Figure 3: Position of the cam, the lever and the arm as the chin guard starts its movement upwards.

Figure 4: Starting position of the chin guard and the visor, showing the position of the cam, the lever and the arm.

Figure 5: Position of the crank, the cam, the lever and the arm as the chin guard in the starting position.

Figure 6: The helmet when the chin guard is placed at the back, showing the slot and the projection.

Figure 7: Position of the crank, the cam, the lever and the arm as the chin guard in the middle position. Part of the chin guard has been removed to better show the mechanism.

Description of a preferred embodiment

[0013] An embodiment of the invention is briefly described below, as an illustrative and nonlimiting example thereof.

[0014] In figures 1-6 a first embodiment of a helmet according to the invention is shown. It comprises a helmet body (1) with a frontal opening (11) covered by a visor (2) and a chin guard (3). The represented example has a solar screen (4) protecting against the sun, which is not relevant to the invention.

[0015] The visor (2) and the chin guard (3) are articulated so that the user can move them and place them behind the body (1) of the helmet, in a withdrawn position. Figures 2 to 4 show the different stages.

[0016] The visor (2) is articulated on a first axis (21) to

which it is attached by an arm (22). This arm (22) has a first radial section and a second transversal section attached to the side of the visor (2).

[0017] For its part, the chin guard (3) is connected to a projection (31) attached to the body (1). The projection (31) is arranged closer to the front opening (11) of the body (1) than the first axis (21). It is placed lower than the arm (22). A crank (32) joins the chin guard (3) to a second axis (33), arranged above the first axis (21) and the projection (31) and closest to the frontal opening (11) than both. The crank (32) is connected by a joint (34) to the chin guard (3). On the second axis (33) there is a cam (35) that rotates integral with the crank (32).

[0018] The chin guard (3) has a general C-shape so that it is hinged at both ends to the body (1). It comprises a slot (36) through which the projection (31) slides, so that rotation around both the protrusion (31) and the second axis (33) is allowed.

[0019] The mechanism also has a lever (5) arranged equally close to the cam (35) and the arm (22) and below both, so that if the cam (35) pushes the lever (5) downwards, the arm (22) goes up. The cam (35) is dimensioned so that it releases the lever (5) when the chin guard (3) is in both extreme positions and pushes on the lever (5) in the rest of the positions of the chin guard (3). Thus, when the visor (2) is in front of the opening (11), any movement of the chin rest (3) forces the visor (2) to rise from its position. This allows the chin guard (3) to come out or back to the frontal position. The visor (2) might be mounted on a return spring on the arm (22), so the distance between the first axis (21) and the visor (2) may be varied.

[0020] As the second axis (33) is closer to the frontal opening (11) of the helmet, in the rear position the chin guard (3) is tighter to the body (1) than in the front position.

[0021] The projections (31), braces (32), slots (36) and other elements can be arranged on both sides or only on one. It is more preferable to arrange them in both to maintain the symmetry and stability of the ensemble.

[0022] As shown in the figures, mainly in figure 4, when the chin guard (3) is placed at the back of the helmet, the visor (2) can be freely moved. The cam (35) does not affect the lever (5), nor the arm (22).

[0023] All the elements can be covered by a shell, so that the possibility of introducing dirt into the mechanism is reduced.

Claims

1. Helmet with chin guard, comprising a helmet body (1) with a front opening (11) for the user's face, a transparent visor (2) and a chin guard (3), the visor (2) and the chin guard (3) each being mobile between a frontal position in front of the opening (11) and a withdrawn position, **characterized in that:**

the visor (2) is articulated to the body (1) by a

first axis (21) from which an arm (22) connecting to the visor (2) emerges;

the chin guard (3) has a slot (36) through which a projection (31), attached to the body (1) slides, the projection (31) being closer to the opening (11) than the first axis (21);

the chin guard (3) is articulated to a crank (32) hinged to a second axis (33) that includes a cam (35) attached to the crank (32), the second axis (33) being above the first axis (21) and closer to the opening (11) than the projection (31); and a lever (5) below the cam (35) and the arm (22), the ends of the lever (5) resting on both the cam (35) and the arm (22);

so that

the cam (5) is dimensioned so that it releases the lever (5) when the chin guard (3) is in both extreme positions and impinges on it in the rest of the travel, raising the arm.

Fig. 1

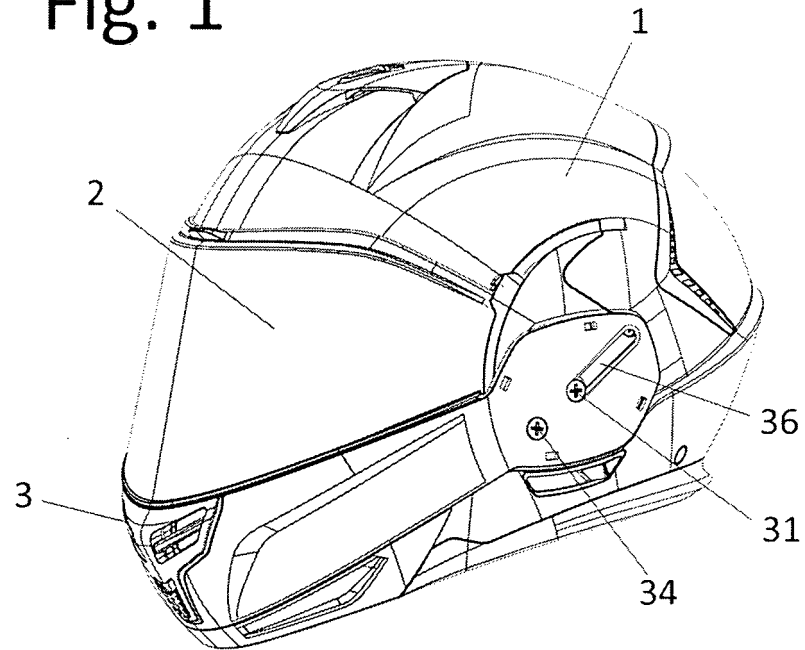
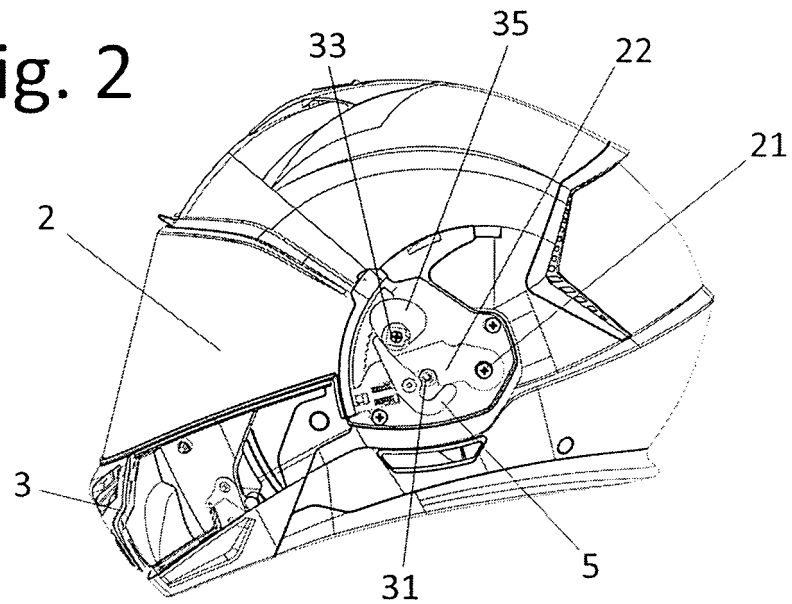


Fig. 2



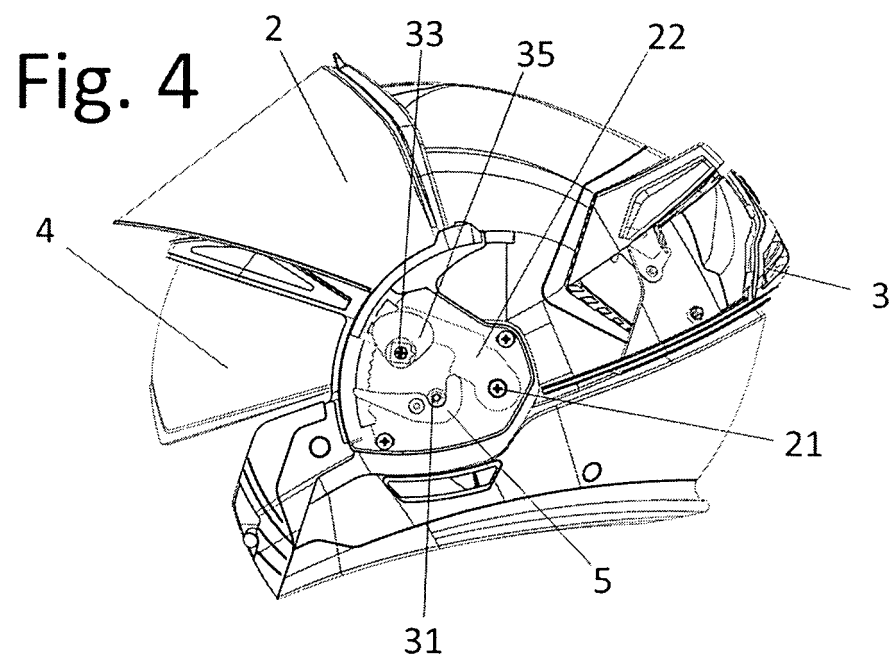
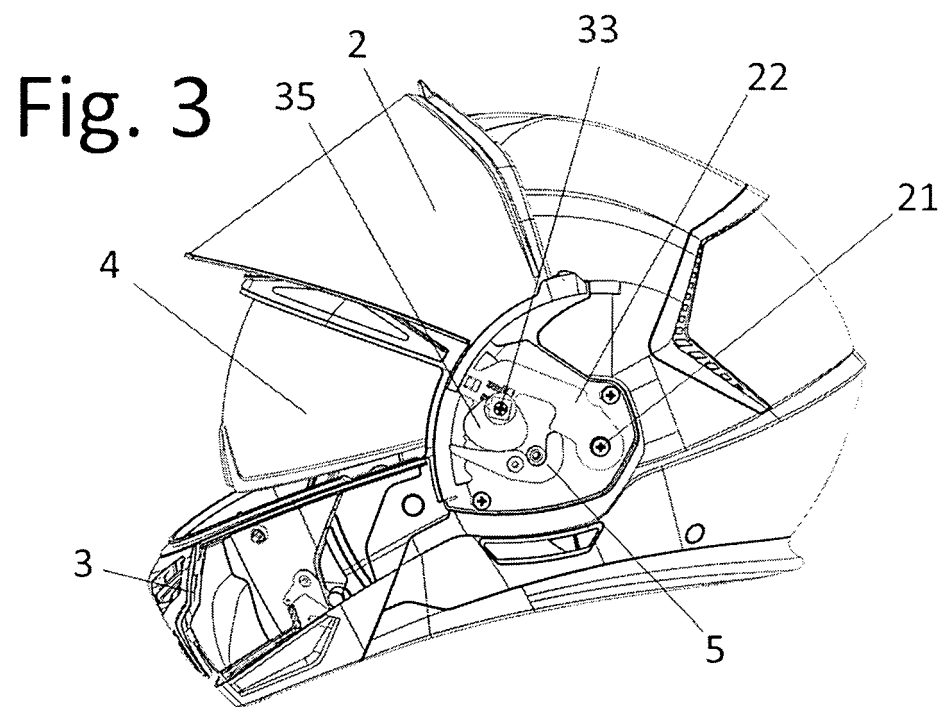


Fig. 5

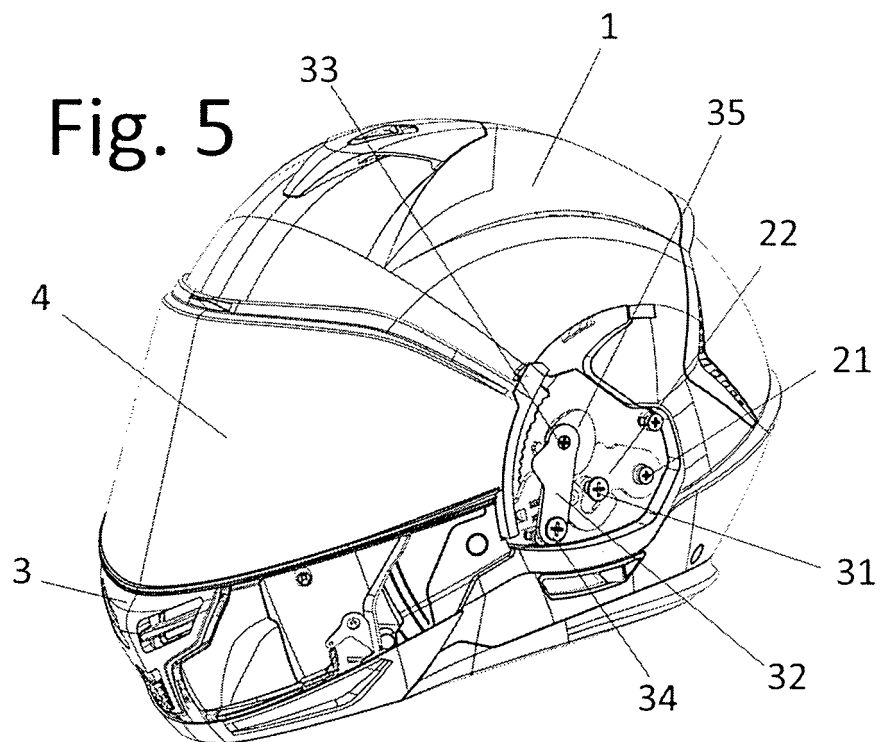
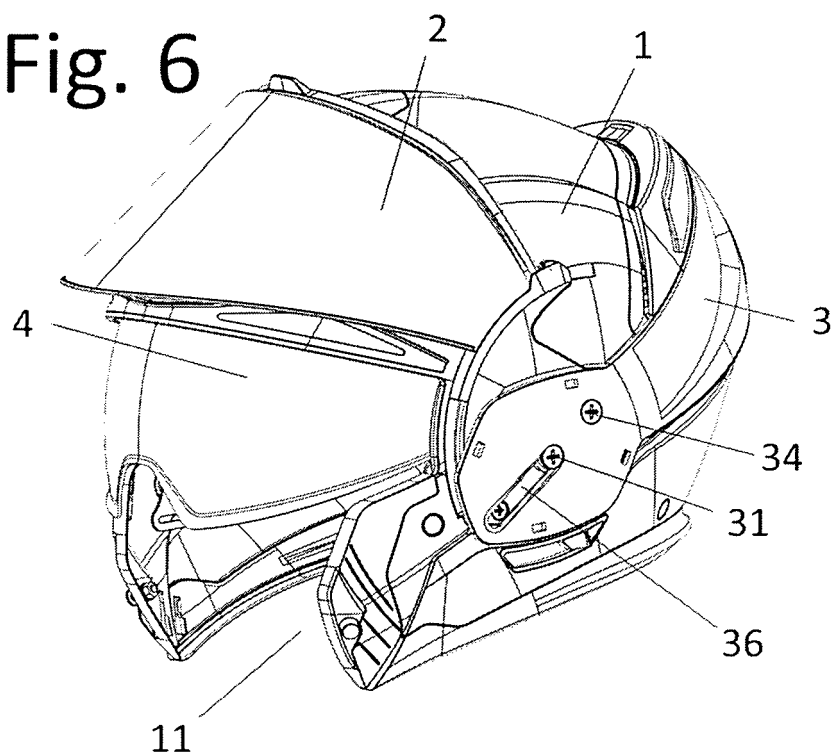
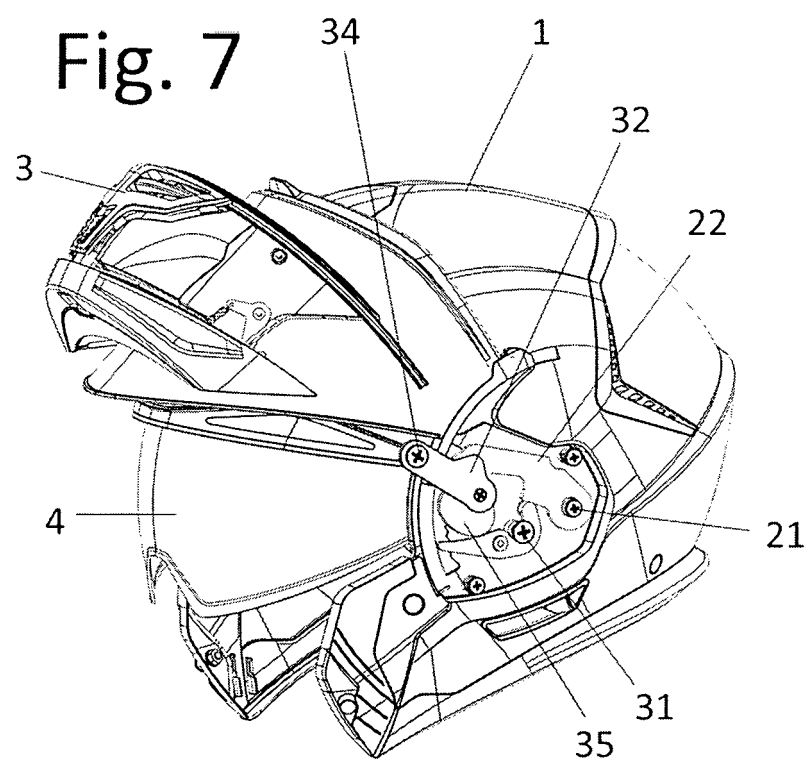


Fig. 6







EUROPEAN SEARCH REPORT

Application Number

EP 23 38 2357

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2022/173097 A1 (HJC CORP [KR]) 18 August 2022 (2022-08-18) * abstract; figure 4b *	1	INV. A42B3/32
A,D	US 2016/015114 A1 (BERTHIER PHILIPPE [FR] ET AL) 21 January 2016 (2016-01-21) * claim 1; figures 1,2 *	1	
A	US 2008/196148 A1 (MORIN CLAUDE [FR]) 21 August 2008 (2008-08-21) * figures 1-7 *	1	
A	US 2018/213877 A1 (LIAO HAOTIAN [CN] ET AL) 2 August 2018 (2018-08-02) * paragraph [0049]; figure 4 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A42B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 October 2023	Examiner D'Souza, Jennifer
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EP 23 38 2357

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2022173097 A1	18-08-2022	EP 4268657 A1	01-11-2023
		KR 102433223 B1	18-08-2022
		WO 2022173097 A1	18-08-2022
US 2016015114 A1	21-01-2016	AU 2015205831 A1	04-02-2016
		BR 102015017243 A2	26-01-2016
		EP 2976957 A1	27-01-2016
		ES 2625394 T3	19-07-2017
		FR 3023681 A1	22-01-2016
		US 2016015114 A1	21-01-2016
US 2008196148 A1	21-08-2008	AT 471087 T	15-07-2010
		CA 2609525 A1	07-12-2006
		CN 101212913 A	02-07-2008
		EP 1887898 A1	20-02-2008
		FR 2886521 A1	08-12-2006
		JP 4792080 B2	12-10-2011
		JP 2008542564 A	27-11-2008
		US 2008196148 A1	21-08-2008
		WO 2006128833 A1	07-12-2006
US 2018213877 A1	02-08-2018	AU 2016225881 A1	04-01-2018
		CA 3034605 A1	14-12-2017
		CN 105901820 A	31-08-2016
		EP 3278684 A1	07-02-2018
		ES 2725680 T3	26-09-2019
		PL 3278684 T3	30-08-2019
		US 2018213877 A1	02-08-2018
		WO 2017210945 A1	14-12-2017

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1101419 A1 [0003]
- EP 2976957 A1 [0003]
- ES 2359494 T3 [0003]