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(54) FALL PROTECTION DEVICE FOR VERTICAL LIFELINES

(57) A fall-prevention device for vertical lifelines characterized in that it comprises a body (1) that accommodates different elements and parts of the device, having an ending extension (2) whose end is arranged backwards, thus defining an entrance (3), and a housing (4) accommodating a cable (5), a cam (6) that blocks and unblocks the cable depending on whether it remains a fixed position or is pulled down along the cable (5), **characterized** in that it comprises:
- a rotating gate (7) which, in its working position blocks the entrance (3), preventing the exit of the cable (5) from inside the housing (4);
- a first blocking mechanism (8) of the gate (7), including at least one outer end (9) and one inner end (10), and
- a second blocking mechanism (12) mechanically connected to the cam (6) by second elastic means (13),
and wherein the cam (6) and the inner end (10), when in a working position, both blocks the gate (7) and prevent the exit of the cable (5) from inside the housing (4), and when in its resting position, the inner end (10) and the cam (6) are displaced and unblock the gate (7), which, by rotation, allows the cable (5) to exit from inside the housing (4).

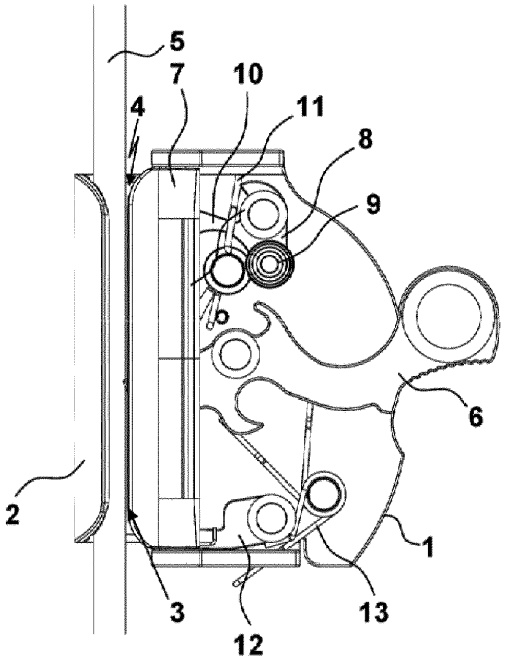

FIG. 5

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Description

[0001] Fall prevention device for vertical lifelines.

[0002] A fall-prevention device for vertical lifelines characterized in that it comprises a body that accommodates different elements and parts of the device, having an ending extension whose end is arranged backwards, thus defining an entrance, and a housing accommodating a cable, a cam that blocks and unblocks the cable depending on whether it remains a fixed position or is pulled down along the cable, characterized in that it comprises: a rotating gate which, in its working position blocks the entrance, preventing the exit of the cable from inside the housing; a first blocking mechanism of the gate, including at least one outer end and one inner end, and a second blocking mechanism mechanically connected to the cam by second elastic means, and wherein the cam and the inner end, when in a working position, both blocks the gate and prevent the exit of the cable from inside the housing, and when in its resting position, the inner end and the cam are displaced and unblock the gate, which, by rotation, allows the cable to exit from inside the housing.

BACKGROUND OF THE INVENTION

[0003] Different devices for the prevention of falls in vertical lifelines are known in the state of the art.

[0004] Thus, state of the art is European Patent No. 1359980 (ES2292715) "MOBILE DEVICE FOR THE PREVENTION OF FALLS FOR SAFETY SUPPORT", of the year 2002, in the name of S.S.E., SRL, which refers to a mobile fall prevention device for safety support, of the type comprising a shaft retention groove, in which said safety support is retained thanks to a lever that rotates between an opening position and a closing position, one end of which comprises a locking cam and the other, free end comprises a coupling hole intended to receive a retaining ring, while a stop system limits the rotation of the lever at an intermediate position when the closing position moves into the opening position, characterized in that the stop system is made up of a folding mobile stop.

BRIEF DESCRIPTION OF THE INVENTION

[0005] The present invention belongs to the field of fall prevention devices for vertical lifelines.

[0006] The nearest document is the above-mentioned European Patent No. 1359980 (ES2292715).

[0007] Said device has the advantage of having a safety system that prevents the cable from getting out the housing during the vertical displacement.

[0008] On the contrary, its disadvantage lies in that said safety system relies on exerting pressure on the cable, so that, if the cable is displaced as a consequence of a sudden movement, the cable could come out of the housing and, consequently, the operator would fall down.

[0009] The present invention solves the above problems by providing a gate that is blocked on one side by the cam which continues blocking the gate both when the device is stopped with respect to the cable and when the cam is displaced; and by a mechanism activated by the operator, which blocks the gate and is only released when the operator so decides, thus preventing the accidental opening of the gate.

[0010] A fall-prevention device for vertical lifelines characterized in that it comprises a body that accommodates different elements and parts of the device, having an ending extension whose end is arranged backwards, thus defining an entrance, and a housing accommodating a cable, a cam that blocks and unblocks the cable depending on whether it remains a fixed position or is pulled down along the cable, characterized in that it comprises: a rotating gate which, in its working position blocks the entrance, preventing the exit of the cable from inside the housing; a first blocking mechanism of the gate, including at least one outer end and one inner end, and a second blocking mechanism mechanically connected to the cam by second elastic means, and wherein the cam and the inner end, when in a working position, both blocks the gate and prevent the exit of the cable from inside the housing, and when in its resting position, the inner end and the cam are displaced and unblock the gate, which, by rotation, allows the cable to exit from inside the housing.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] In order to facilitate the explanation, enclosed to this description are four sheets of drawings that represent a practical case of embodiment, provided as a non-limiting example of the scope of the present invention:

- Figure 1 is a general view of the invention with the device moving along the cable.
- Figure 2 is a view of figure 1 without the front lid.
- Figure 3 is a view without the front lid with the cam blocking the cable.
- Figure 4 is a rear view, without the rear lid, with the cam blocking the cable.
- Figure 5 is an embodiment with a blocking mechanism, with a button-pin of the outer end.
- Figure 6 is a view without the front lid with the cam unblocking the cable, and
- Figure 7 is a rear view, without the rear lid, with the cam unblocking the cable.

PRACTICAL EMBODIMENT OF THE INVENTION

[0012] Figure 1 shows a body 1, an extension 2, an entrance 3, a housing, 4, a cable 5, a cam 6, a gate 7, an outer end 9 (of the first blocking mechanism) and an associated device 14.

[0013] Figure 2 shows the body 1, the extension 2, the entrance 3, the housing 4, the cable 5, the cam 6, the

gate 7, a first blocking mechanism 8 with the outer end 9, an inner end 10, first elastic means 11, a second blocking mechanism 12 and the associated device 14.

[0014] Figure 3 shoes the body 1, the housing 4, the cable 5, the cam 6, the gate 7, the inner end 10, the first elastic means 11, the second blocking mechanism 12 and the associated device 14.

[0015] Figure 4 shows the cable 5, the cam 6, the gate 7, the outer end 9, the inner end 10, the first elastic means 11, the second blocking mechanism 12 and rotational pins 15.

[0016] Figure 5 shows the body 1, the extension 2, the entrance 3, the housing 4, the cable 5, the cam 6, the gate 7, the first mechanism 8 with the outer end 9 and the inner end 10, the first elastic means 11, a second blocking mechanism 12 and the second elastic means 13.

[0017] Figure 6 shows the body 1, the housing 4, the cam 6, the gate 7, the inner end 10, the first elastic means 11, and the second blocking mechanism 12.

[0018] Figure 7 shows the cam 6, the gate 7, the outer end 9, the inner end 10, the first elastic means 11, the second blocking mechanism 12 and rotational pins 15.

[0019] Thus, a practical embodiment of the fall-prevention device for vertical lifelines of this invention comprises a body 1, which accommodates inside a mayor parts of the elements and parts of the device.

[0020] The device comprises one extension 2 that is placed backwards, J-shaped, at its end. Said extension defines an entrance 3 and forms a housing 4 wherein a cable 5 is provided.

[0021] It also comprises a cam 6 which blocks and unblocks the cable 5 whether it remains in fixed position or is pulled down along the cable 5.

[0022] The mechanism also includes a gate 7, which rotates thanks to the rotating pins 15. Said gate 5, blocks the entrance 3 when in a working position, thus preventing the exit of the cable 5 from inside the housing 4.

[0023] The device also includes a first blocking mechanism 8 of the gate 7, which comprises at least one outer end 9, which will be manipulated by the operator, and an inner end 10 which blocks and unblocks the gate 7.

[0024] Thus, the cam 6 and the inner end 10, when in a working position, block the gate 7, thus preventing the exit of cable 5 from inside the housing 4 and, when in a resting position, when the cable 5 needs to be taken out of the housing 4, the inner end 10 and the cam 6 are displaced and unblock the gate 7 which, by rotating, allows the exit of cable 5 from inside the housing 4 (figs. 6 and 7).

[0025] Optionally, the first blocking mechanism 8 and the cam 6 may be mechanically connected by first elastic means 11.

[0026] In addition, the device comprises as second blocking mechanism 12, which is mechanically connected to the cam 6 by second elastic means 13. This second blocking mechanism 12 is acting by gravity, that is, if the device is directed backwards, the mechanism blocks the opening of the gate 7.

[0027] In this manner, as illustrated in figure 1, the operator could move upwards and downwards the cable 5 because the cam 6 is not blocking the cable.

[0028] When the operator decides to stop at a certain point of the cable 5, he or she would lower the cam 6, thus blocking the cable 5 (figure 3).

[0029] As shown in figure 4, the gate 7 is provided with a first blocking mechanism 8, which causes the inner end 10 to prevent that the gate 7 may rotate and release the cable 5 from the inside.

[0030] In addition, cam 6, whether cable 5 is being blocked or has already released, is placed behind the gate 8, thus preventing the opening of said gate 8.

[0031] When the operator has ended the work and wants to free the cable 5, the operator will proceed in the following manner.

[0032] The cam 6 (fig. 4) should be displaced in the direction of the first blocking mechanism 8; upon reaching the limit stopper, it would move to the outer end 9 in the direction of the cam 6, thus blocking the cam 6.

[0033] At the same time, both the cam 6 and the inner end 10 move away from the back section of the gate 7, avoiding interference with the rotation and opening of said gate 7.

[0034] Next, the gate 7 will be released and will rotate on the rotation pins 15, unblocking the gate 7 and the entrance 3 and allowing the exit of cable 5 from inside the housing 4 (figs. 6 and 7).

[0035] The fall-prevention device may be combined with other associated devices 14, thus increasing the safety of the operators at work, such as, for example, the energy absorbing device of Utility Model U201830473 in the name of the same applicant company as this invention.

[0036] This invention describes a new fall-prevention device for vertical lifelines. The examples mentioned herein do not limit the present invention, which may have different applications and/or adaptations, included within the scope of the following claims.

Claims

1. A fall-prevention device for vertical lifelines **characterized in that** it comprises a body (1) that accommodates different elements and parts of the device, having an ending extension (2) whose end is arranged backwards, thus defining an entrance (3), and a housing (4) accommodating a cable (5), a cam (6) that blocks and unblocks the cable depending on whether it remains a fixed position or is pulled down along the cable (5), **characterized in that** it comprises:

    - a rotating gate (7) which, in its working position blocks the entrance (3), preventing the exit of the cable (5) from inside the housing (4);

- a first blocking mechanism (8) of the gate (7), including at least one outer end (9) and one inner end (10), and
- a second blocking mechanism (12) mechanically connected to the cam (6) by second elastic means (13),

and wherein the cam (6) and the inner end (10), when in a working position, both blocks the gate (7) and prevent the exit of the cable (5) from inside the housing (4), and when in its resting position, the inner end (10) and the cam (6)are displaced and unblock the gate (7), which, by rotation, allows the cable (5) to exit from inside the housing (4).

2. A device according to claim 1, **characterized in that** the first blocking mechanism (8) and the cam (6) are mechanically connected by first elastic means (11).

FIG. 2

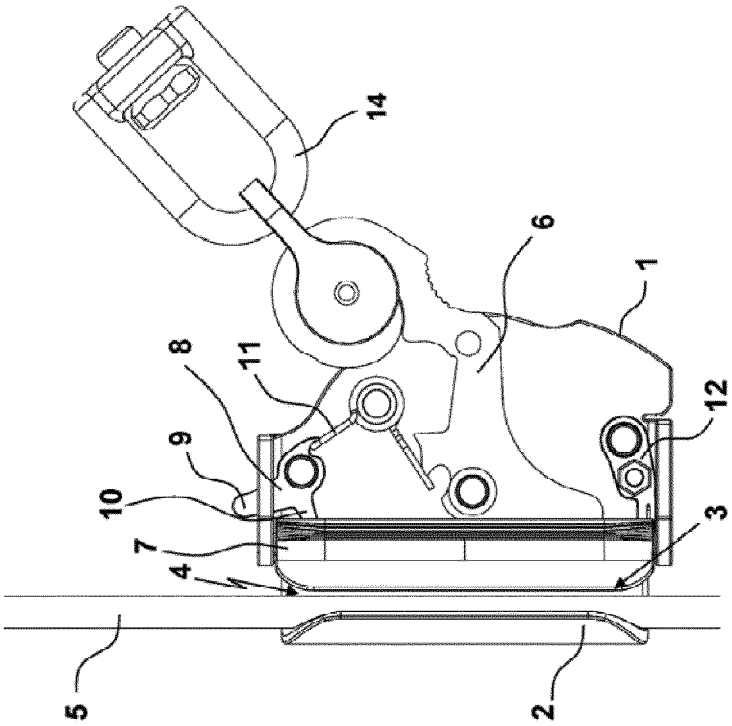
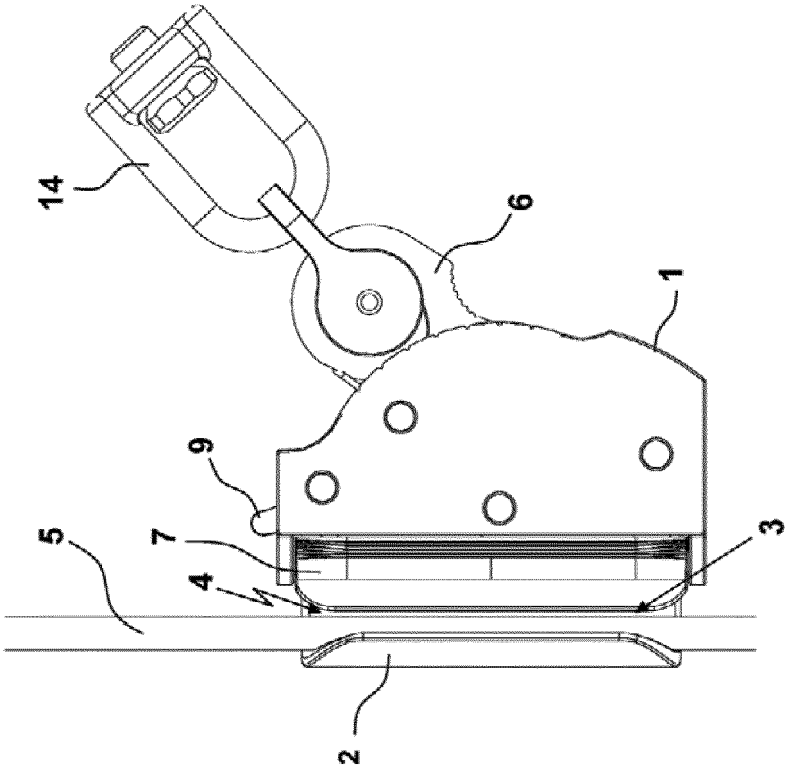


FIG. 1



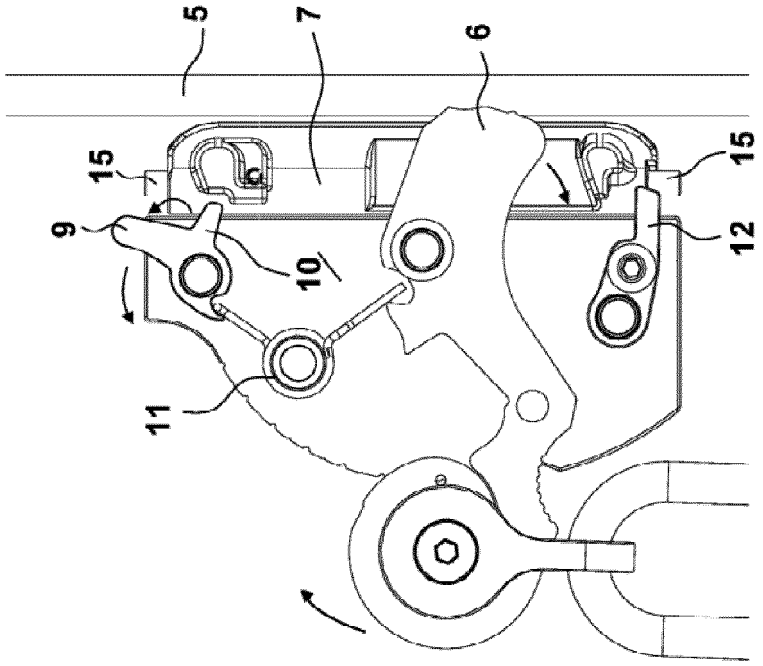


FIG. 4

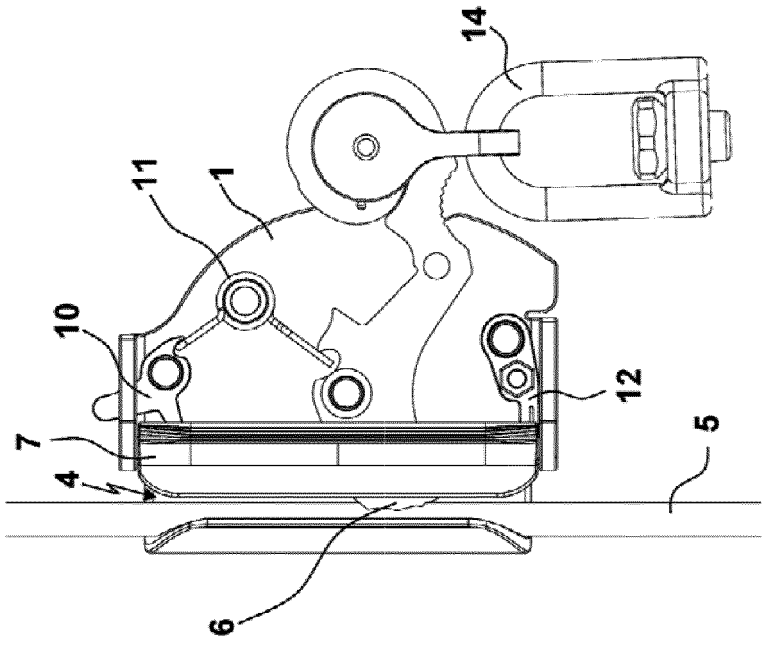


FIG. 3

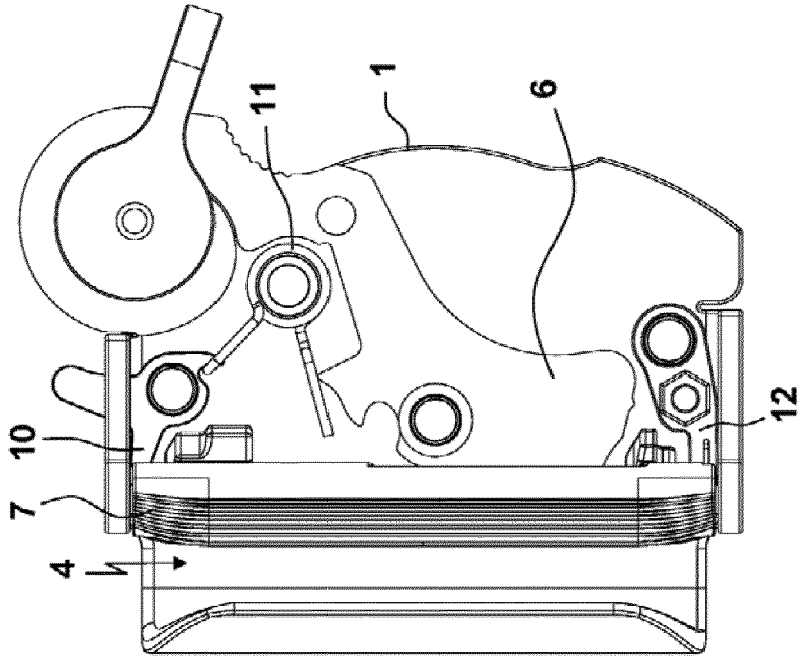


FIG. 6

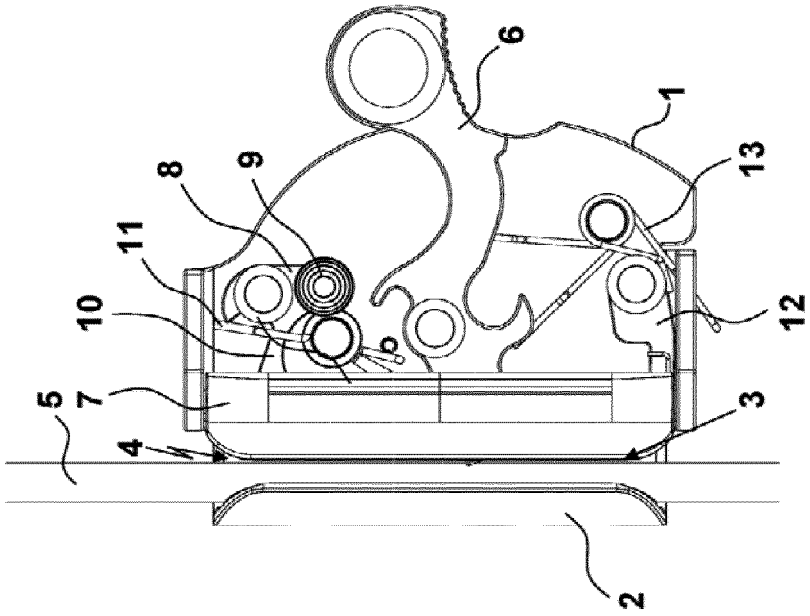


FIG. 5

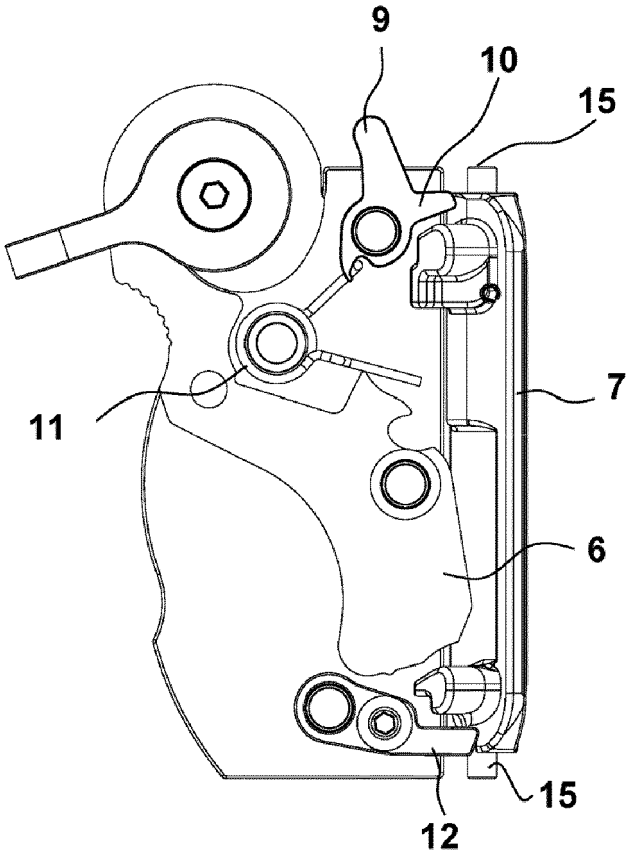


FIG. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 18 20 9590

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	US 6 019 195 A (PELOFI PIERRE-GEORGES [FR]) 1 February 2000 (2000-02-01) * the whole document * -----	1,2	INV. A62B1/14 A62B35/00
A	WO 91/00121 A1 (STEPHENSON JOHN [CA]; MCGUFFIE IAN [CA]) 10 January 1991 (1991-01-10) * the whole document * -----	1,2	

TECHNICAL FIELDS SEARCHED (IPC)

A62B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	5 September 2019	Paul, Adeline

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

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05-09-2019

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- EP 1359980 A **[0004] [0006]**
- ES 2292715 **[0004] [0006]**