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(54) **HINGE OF A LID OF A CABINET OF A VEHICLE CABIN AND CABINET COMPRISING THE HINGE**

(57) Hinge (2) of a lid (H) of a cabinet (1) of a vehicle cabin. The hinge has a pivot (P) fixed to one edge of said lid (H), a plate (PS) having a circular hole (F) defining an axis of symmetry (X) perpendicular to a planar extension of the plate (P) and at least three grooves (N1, N2) having a longitudinal shape, arranged at the edge of the hole radially extending and mutually angularly offset with re-

spect to the axis of symmetry (X), where the pivot (P) comprises a tubular body (PB) having a longitudinal extension according to the axis of symmetry (X) with a closed base ending in a pin (PN) coaxial with the body and one or more axially mobile teeth (T), arranged on the edge of said pin (PN) and complementary to each of the notches (N1 and N2).

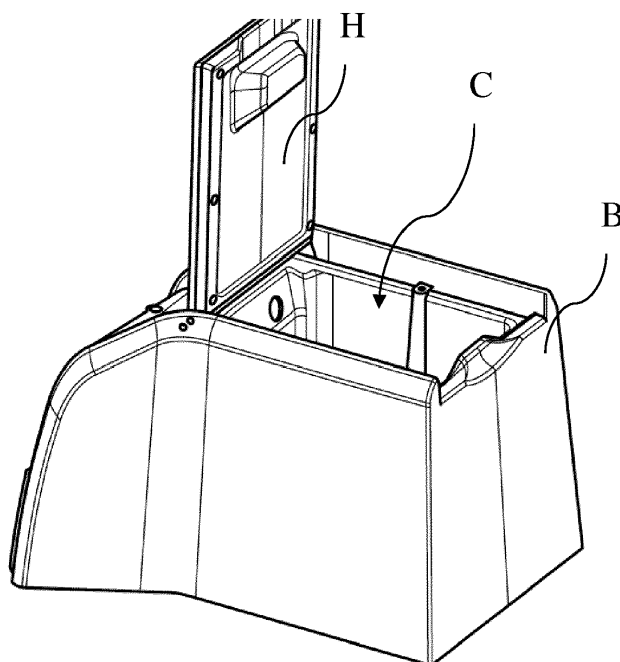


Fig. 2

DescriptionField of application of the invention

[0001] The present invention refers to the field of the furniture inside a vehicle cabin, in particular of an industrial vehicle. More specifically, the invention regards a hinge of a lid of a cabinet of a vehicle cabin and the cabinet obtained suitable to hold the lid in three or more mutual positions with respect to the respective cabinet.

Prior art

[0002] Cabinets and furniture for vehicle cabins in which the driver's personal belongings, or canned and bottled drinks can be stored, are known in the prior art. Such cabinets are usually placed at the side of the driver's driving seat with the respective lid arranged on the top which may, in the closed position, define an armrest for said driver.

[0003] The lid can be opened by tilting it either forwards or backwards.

[0004] As a general rule, in motor cars there is a preference for lids that are tilted backwards, whereas in heavy duty vehicles, which have very spacious cabins compared to motor cars, there is a preference for lids that are tilted forwards.

[0005] Between the completely open condition and the completely closed position, it is sometimes necessary to lock the lid in at least one intermediate position.

[0006] Extremely complex locking systems exist, which require the driver to open the lid fully before being able to release the hinge and re-close the lid. This solution does not appear to be satisfactory.

Summary of the invention

[0007] The purpose of the present invention is to overcome the aforesaid inconveniences and to provide an extremely simple and economical hinge that allows the lid of a vehicle cabinet to be locked in at least one intermediate position and then to be closed without necessarily having to open the lid completely.

[0008] The idea at the basis of the present invention is to produce a hinge that allows the lid of a vehicle cabinet to be locked in one or more intermediate positions and then easily re-closed.

[0009] The object of the present invention is a hinge of a lid of a cabinet of a vehicle cabin.

[0010] Another object of the present invention is a cabinet comprising said hinge.

[0011] A further object of the present invention is an industrial vehicle comprising said cabinet.

[0012] The claims describe preferred embodiments of the invention and form an integral part of the present description.

Brief description of the figures

[0013] Further purposes and advantages of the present invention will become clear from the following detailed description of a preferred embodiment (and of alternative embodiments) thereof and from the accompanying drawings which are merely illustrative and not limiting, in which:

figure 1 shows a perspective view of a vehicle cabinet, provided with the hinge that is the object of the present invention and having a lid in the condition in which it closes the inside compartment of said cabinet to which it gives access, while,
figure 2 shows the same view of figure 1 in which the lid is in an intermediate locked position, and
figure 3 shows the same view of figures 1 and 2 in which the lid is in a fully open position;
figures 4 and 5 show portions relative to the hinge that is the object of the present invention,
figure 6 shows an alternative embodiment of a portion of figure 4,
figure 7 shows the hinge that is the object of the present invention in relation to the cabinet shown in figures 1 - 3,
figure 8 shows an example of connection between the hinge shown in figures 4 - 7 and the cabinet shown in figures 1 - 3;
figures 9 and 10 show the interactions between the parts of the hinge illustrated in figures 4 and 5 in two different moments of a rotation of the lid of the cabinet shown in figures 1 - 3.

In the figures the same reference numerals and letters indicate the same parts and components.

Within the scope of the present invention, the term "second" component does not imply the presence of a "first" component. Such terms are simply used for the sake of clarity and should not be considered as limiting the scope of the invention.

Detailed description of embodiments of the invention

[0014] Figures 1 - 3 illustrate an example of a vehicle cabinet 1 comprising a lid H and a lower body B which defines a housing C suitable to be closed by the lid H. As is visible in figure 1, the overall shape of the cabinet is that of a right prism, although the base of the body may be shaped to complement a vehicle floor to which the cabinet is intended to be permanently fixed.

The lid is substantially planar and preferably rectangular and in the closed position it is substantially horizontal. One side of the lid is hinged to the body of the cabinet. Figure 3 shows the same lid H tilted, with respect to said side, so as to be in the fully open position, in which it is preferably horizontally aligned.

Figure 2 shows the lid in an intermediate position between the closed configuration illustrated in figure 2 and

the completely open configuration of figure 3.

Preferably, in said intermediate configuration the lid is in stable equilibrium even under the effect of the inertial forces due to the movement of the vehicle in which the cabinet is intended to be housed.

Preferably, in the intermediate configuration, the lid is preferably vertically aligned or slightly inclined forwards with respect to the direction of travel of the vehicle in which it is intended to be housed.

Figure 4 shows a first part of the hinge 2, that is to say a plate PS having a circular hole F, which may be a through hole or a blind hole, defining an axis of symmetry X perpendicular to the planar extension of said plate. At the edge of the hole there are at least two pairs of notches N1 and N2 arranged symmetrically with respect to the axis X of the hole, extending radially with respect to the axis of the hole.

Said notches are preferably hemicylindrical, and generally longitudinal and radially aligned with respect to the axis X of the hole F. Note that the notches are angularly offset by 90° to substantially form a cross. Said offsetting may, however, vary according to whether the lid is in the closed position, the completely open position or the intermediate position with respect to the body B of the cabinet 1. Several pairs of notches define several positions of the lid with respect to the body B.

The plate PS may also be made as a single piece with the body B of the cabinet 1, but it is preferably a separate component, as illustrated in figure 6, comprising an appropriate flange FL suitable to be fixed to the body B of the cabinet.

As shown in figure 7, the flange FL is connected to the body B of the cabinet 1 by means of a pair of screws.

Figure 5 shows a second part of the hinge 2, that is to say a pivot P which has a tubular body PB extending along the axis X with a closed base that ends with a pin PN coaxial with the pivot P. The pin PN is complementary to the hole F in the plate PS and is intended to engage the hole F when the lid is assembled on the body of the cabinet.

On the edge of the pin PN there are two axially mobile teeth T, arranged symmetrically with respect to the pin and to the relative axis of extension X and complementary to each of said pairs of notches N1 and N2.

The teeth T are axially mobile between an extraction position, in which they protrude from the base of the tubular body PB, and a retracted position, in which they are at least partially inserted in the tubular body PB. A spring SP loads the teeth T so as to assume the extraction position. Said spring thus penetrates into the tubular body of the pin until coming into contact, from the inside, with a supporting structure (not illustrated) which joins at least the two teeth to form a single body.

For the purposes described here, it would suffice to have a single mobile tooth and three respective notches N1, N2, N3 corresponding to the aforesaid at least three mutual positions of the lid with respect to the body of the cabinet. The use of a pair of teeth T and respective notch-

es is preferable, for reasons of symmetry, to better balance the force exerted by the spring SP and achieve overall robustness.

According to a first preferred alternative embodiment of the invention, the teeth T and the pin PN are integral with one another, forming a single body PT that can move axially with respect to the tubular body of the pivot P.

The base of the tubular body of the pivot P through which the pin PN and the teeth T protrude axially is complementary to the single body PT, so that there can be no rotation between the tubular body PB and the pin PN.

The axial length of the pin PN is such that the lid H does not come off the body B of the cabinet 1 when the teeth are retracted and inside the tubular body of the pivot P.

According to another preferred alternative embodiment of the invention, the pin PN is fixed with respect to the tubular body PB and only the teeth are able to translate axially. This solution is less preferable than the previous one, in that the single body formed by the pin PN and by the teeth T is more robust than the two teeth T only.

As is visible in figures 9 and 10, when the pivot P is made to rotate, by acting on the lid, the force of the spring SP is overcome, forcing the teeth T and possibly also the pin P to retract, so as to allow the lid to rotate with respect to the body C of the cabinet 1.

[0015] According to a preferred alternative embodiment of the invention, the external shape of the tubular body defining the pin is complementary to a groove-shaped seat TH obtained in a face of the lid, preferably the one intended to face the cavity C when the lid is closed. Said groove also has a longitudinal extension X and is obtained parallel to an edge of the lid H.

Preferably, the groove TH defines a fixed point for one end of the helical spring SP, whereas the opposite end of the spring SP, as described above, is inside the tubular body of the pivot P to load the tooth T.

The groove comprises two zones, a first zone TH1 adjacent to the fixed point of the helical spring SP, which allows the insertion of the tubular body PB according to a radial translation, with respect to the longitudinal extension X of the groove, moving the pin parallel thereto. The helical spring SP pushes the pin towards the adjacent edge of the lid, so that the pin PN can protrude externally with respect to the latter.

In this way the tubular body PB engages a second zone TH2 of the guide, adjacent to the first zone TH1, according to an axial movement. This achieves a coupling, from which the pivot P cannot be released except by an axial movement opposite to the previous one, that is to say, against the force exerted by the helical spring.

Therefore, according to the present invention, the helical spring SP of the hinge allows the condition in which the lid is locked with respect to the body B of the cabinet 1, as well as the condition in which the pivot P is held in place inside the seat of the lid.

In this way the assembly of the cabinet is extremely simple and economical.

Preferably, the cabinet 1 which is the object of the present

invention is arranged so that the lid H is opened by tilting it forwards according to a direction of travel of the vehicle. Furthermore, according to a preferred alternative embodiment of the invention, the lid H may comprise means, springs, clips, etc., to fix papers and documents to one of the inside and/or outside faces of the lid.

[0016] Other possible embodiments of the non-limiting example of the invention described herein may be implemented without departing from the scope of protection of the present invention, including all the equivalent embodiments implemented by the person skilled in the art.

[0017] From the above description it will be possible for the person skilled in the art to implement the object of the invention without the need for any additional construction details. The elements and the characteristics illustrated in the different preferred embodiments may be combined without departing from the scope of protection of the present application. All the characteristics described in the description of the prior art, unless specifically disputed or excluded in the detailed description, must be considered in combination with the characteristics of the embodiments described in the detailed description and constitute an integral part of the present invention.

Preferably, the pin PN and/or the pivot P are coupled to the lid in a translation free manner and in a substantially rotationally blocked manner.

Claims

1. Hinge (2) of a lid (H) of a cabinet (1) of a vehicle cabin, said lid, having a substantially planar form, being intended to assume at least three mutual positions with respect to a remaining body (B) of said cabinet, the hinge comprising a plate intended to be fastened to or to be integral with the body (B) of said cabinet (1), a pivot (P) intended to be fastened parallel to an edge of said lid (H), said plate (PS) having:

- a circular hole (F), defining a symmetry axis (X) perpendicular to a planar extension of the plate (PS)
- at least three notches (N1, N2) having a longitudinal shape, arranged at the edge of said hole (F), radially extending and mutually angularly offset with respect to said symmetry axis (X),

wherein said pivot (P) comprises:

- a tubular body (PB) having a longitudinal extension according to said symmetry axis (X) and a closed base ending with a pin (PN) which is coaxial with the tubular body (PB), said pin (PN) being complementary to said hole (F) of the plate (PS) and being intended to engage the hole (F) when said lid (H) is assembled with the body (B) of the cabinet (1)

- one or more axially mobile teeth (T), arranged on the edge of said pin (PN), radially arranged with respect to said symmetry axis (X) and complementary to each of said notches (N1 and N2)
- a helical spring (SP), at least partially arranged in said tubular body to load said one or more teeth (T) so that it/they externally protrudes/protrude with respect to said closed base of the tubular body (PB) of the pivot (P).

2. Hinge according to Claim 1, wherein said pivot (P) comprises a pair of teeth symmetrically arranged with respect to said symmetry axis (X) and wherein said plate (PS) comprises at least three pairs of notches (N1, N2, etc.) corresponding to said at least three mutual positions with respect to a remaining body (B).
3. Hinge according to Claim 1 or 2, wherein said pin is fixed with respect to said closed base, or wherein said pin is integral with said teeth and slideable with respect to said tubular body, thus engaging a complementary opening of said closed base of said tubular body.
4. Hinge according to any one of the preceding Claims, wherein said helical spring (SP) has a first end inside said tubular body (PB) and a second end suitable to find a fixed point in a respective seat of said lid (H).
5. Cabinet (1) of a vehicle cabin, having a lid (H) and a remaining body (B) suitable to be closed by said lid (H), the lid being fixed to the body by means of the hinge according to any one of the preceding Claims 1-4 and the pin (P) being coupled in a translation free manner and in a substantially rotationally blocked manner to the lid (H).
6. Cabinet according to Claim 5, wherein said lid (H) comprises a groove-shaped seat (TH) formed on a face of said lid, parallel to said edge of the lid, having a longitudinal extension according to said symmetry axis (X).
7. Cabinet according to Claim 6, wherein said seat defines a fixed point for said helical spring (SP).
8. Cabinet according to Claim 7, wherein said groove comprises two zones (TH1, TH2), a first zone (TH1) adjacent to said fixed point, shaped for allowing the insertion of the tubular body (PB) of the pivot (P) according to a radial movement with respect to said longitudinal extension (X) of the groove, and a second zone (TH2), adjacent and contiguous to the first zone (TH1), wherein said tubular body (PB) of said pivot (P) is intended to be axially engaged by means of said helical spring (SP).

9. Cabinet according to any one of Claims 5 - 8, wherein said hinge is configured to lock said lid in a substantially horizontal first position in which it completely closes a cavity (C) of said cabinet (1), in a substantially horizontal second position in which said cavity (C) is completely open and in an intermediate position in which said lid is substantially vertical or slightly inclined. 5
10. Industrial vehicle comprising a cabinet (1) according to any one of Claims 5 - 9. 10
11. Vehicle according to Claim 10, wherein said lid (H) is intended to be locked in said intermediate position, thus remaining slightly open and inclined forwards, according to the vehicle travel direction. 15
12. Vehicle according to Claim 11, wherein at least one of the faces of said lid (H) is provided with means to firmly support documents and sheets in general. 20

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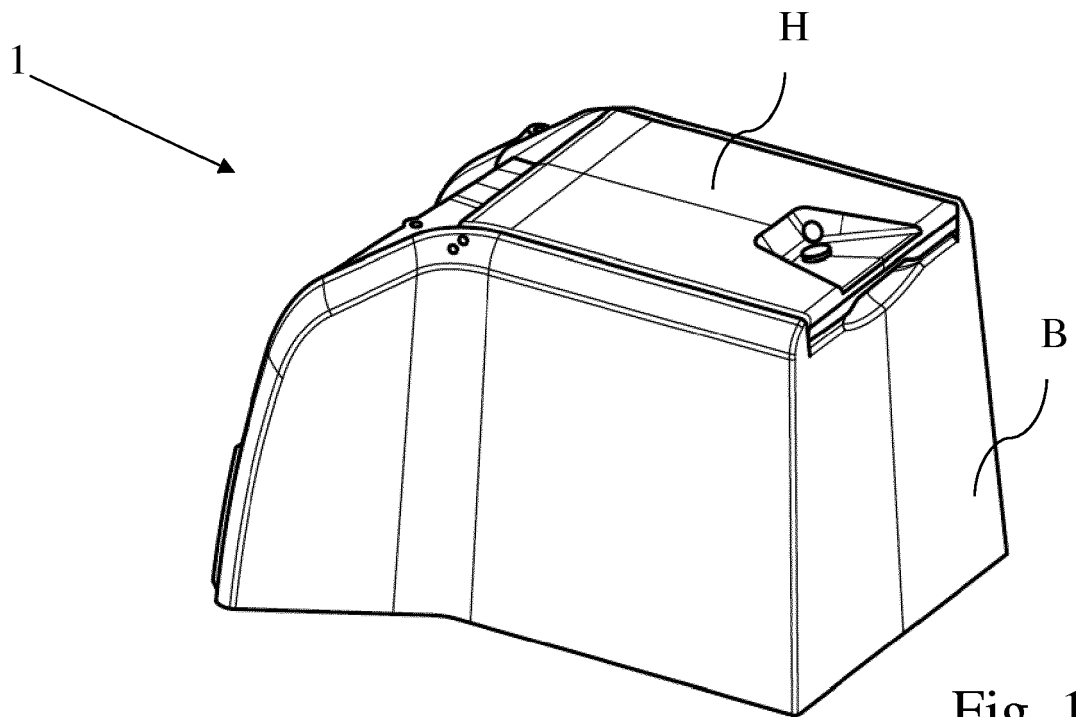


Fig. 1

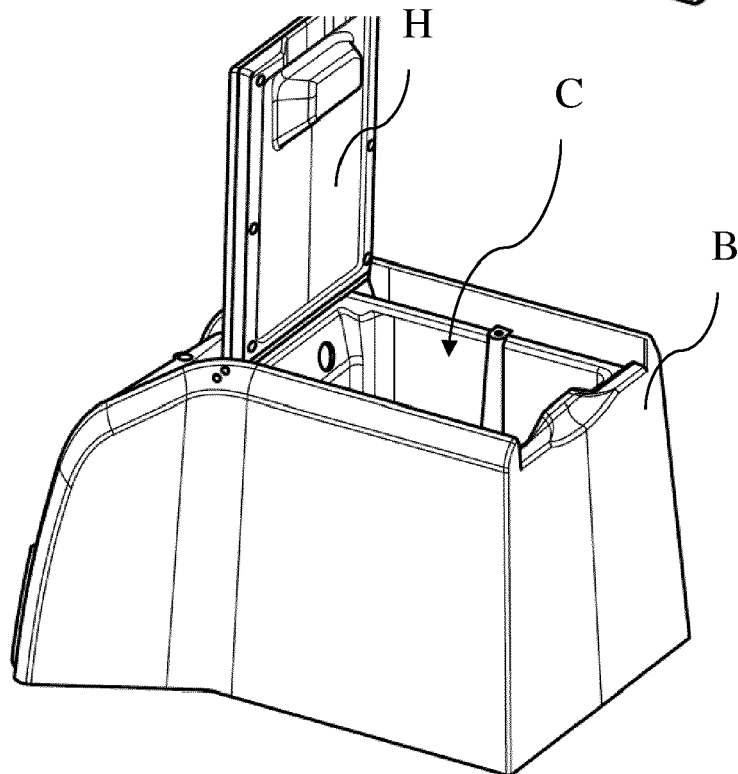


Fig. 2

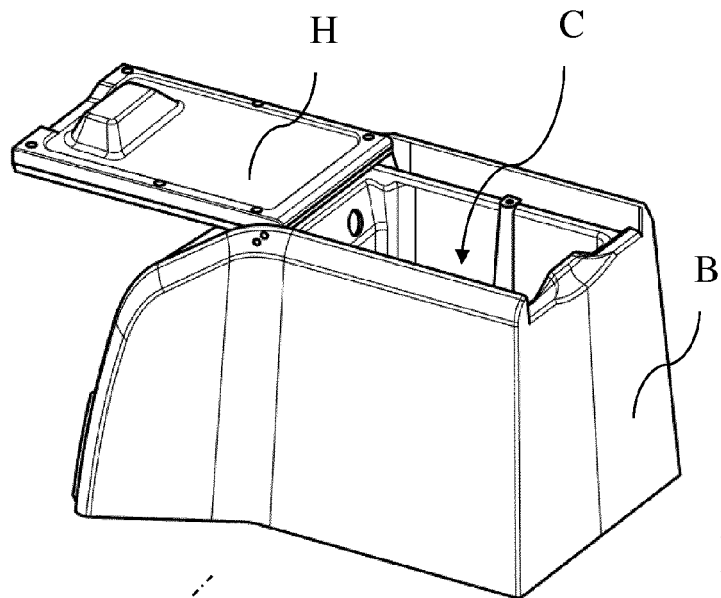


Fig. 3

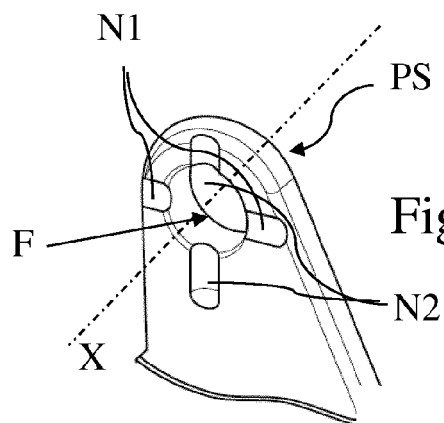


Fig. 4

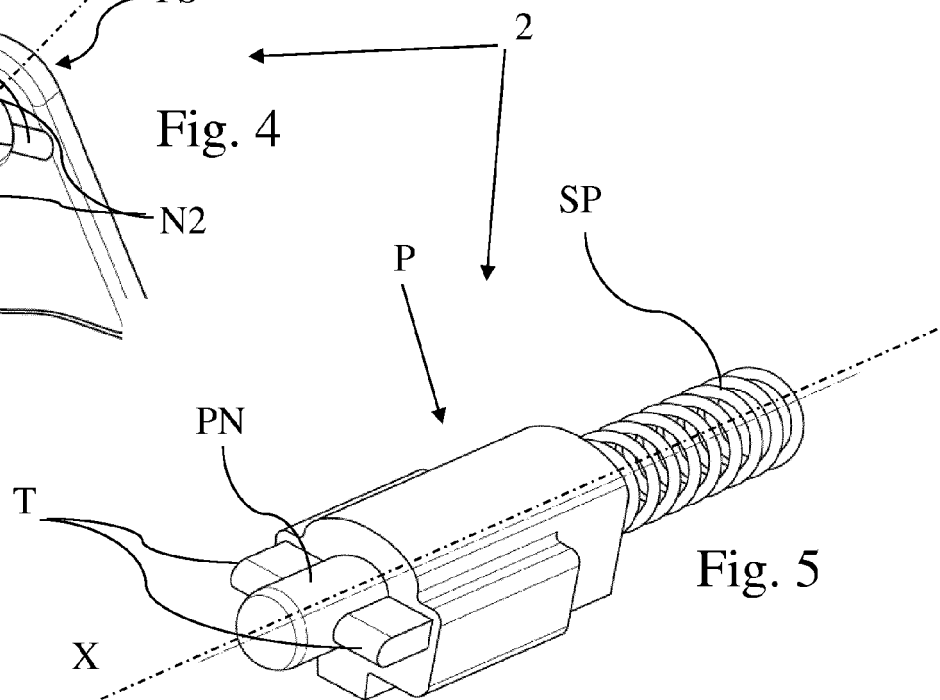
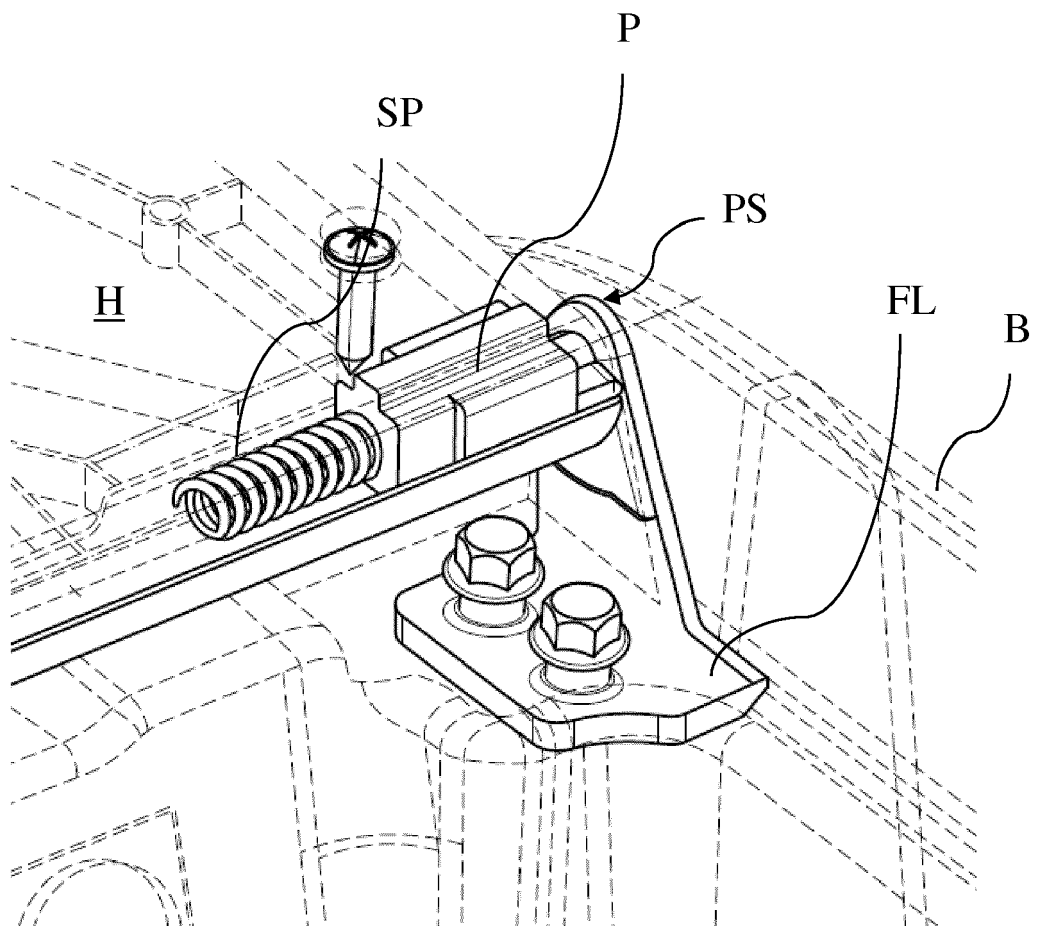
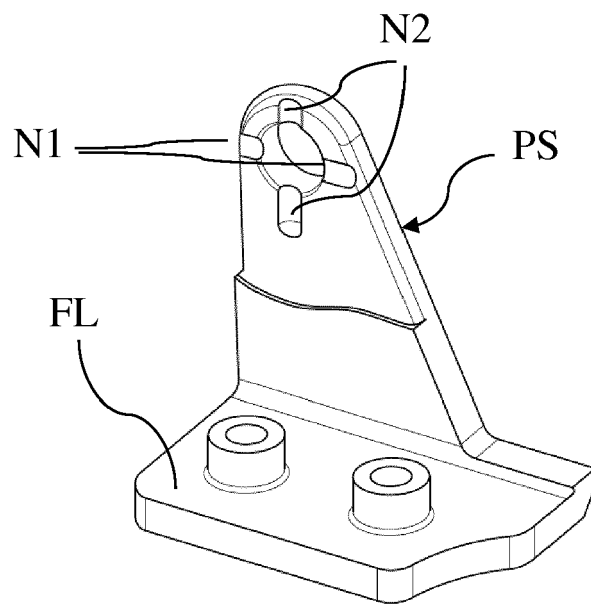
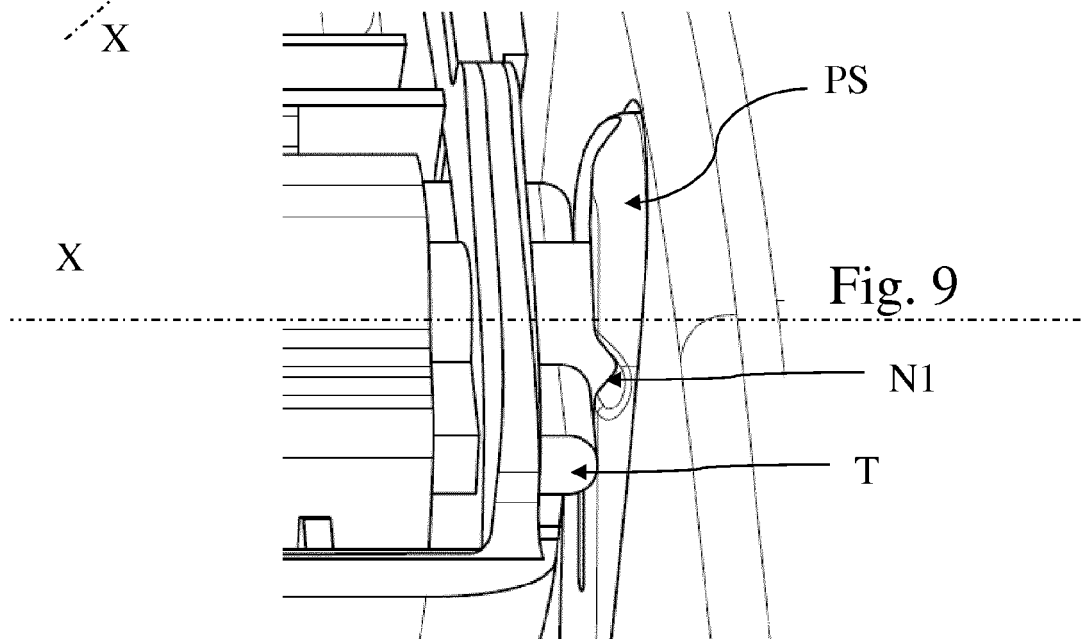
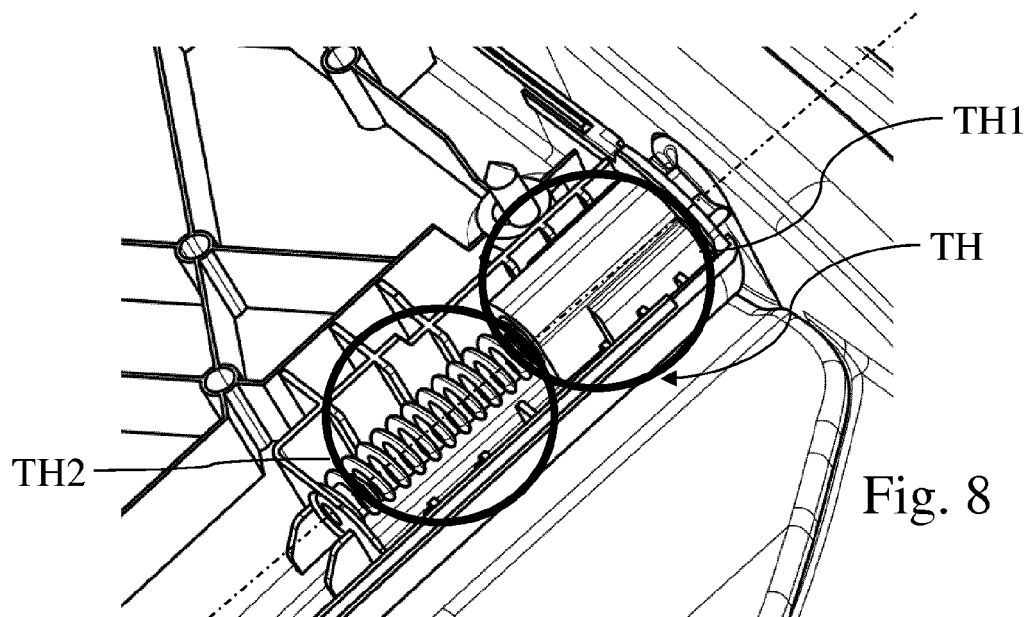


Fig. 5





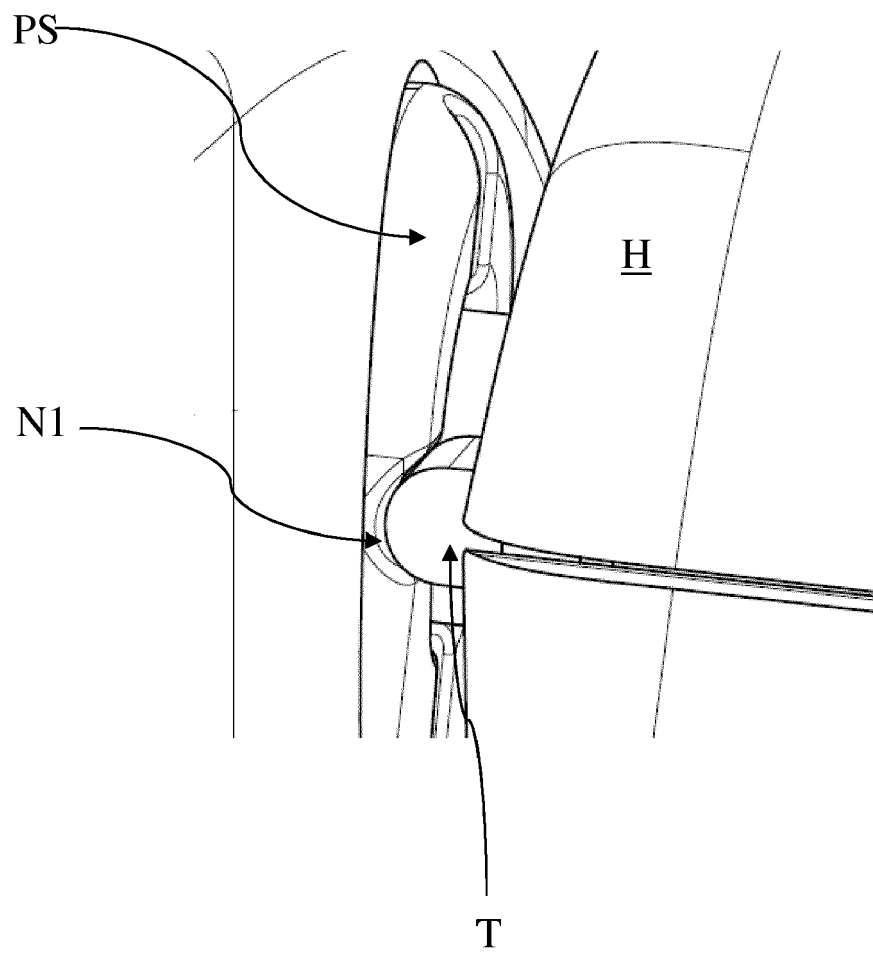


Fig. 10



EUROPEAN SEARCH REPORT

Application Number
EP 15 19 1992

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Y	* page 1, line 71 - page 2, line 54; figures 1-10 *	5-12	
X	US 931 810 A (TAPLING FRANCIS E [US]) 24 August 1909 (1909-08-24) * page 1, line 52 - page 2, line 7; figures 3-5 *	1-4	
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A	DE 24 18 147 A1 (VOLKSWAGENWERK AG) 6 November 1975 (1975-11-06) * figures 6-8 *	1-4	TECHNICAL FIELDS SEARCHED (IPC)
			E05D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 February 2016	Examiner Berote, Marc
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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19-02-2016

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