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(54) **EMERGENCY KEY AND CORRESPONDING ELECTRONIC KEY**

(57) The invention relates to an emergency key comprising a head (1) and an insert (2),
wherein the head comprises a head connector (10) and the insert comprises an insert connector (20), and the insert (2) having a longitudinal axis (A_1),
wherein the head connector (10) and the insert connector (20) are configured to interlock with each other by shape cooperation, and
wherein the insert connector (20) comprises at least one insert protuberance (25) projecting from the longitudinal axis (A_1), and the head connector (10) comprises at least one recess (15) receiving said protuberance (25) when the insert connector (20) and the head connector (10) interlock with each other.

The invention further relates to an electronic key comprising the above emergency key.

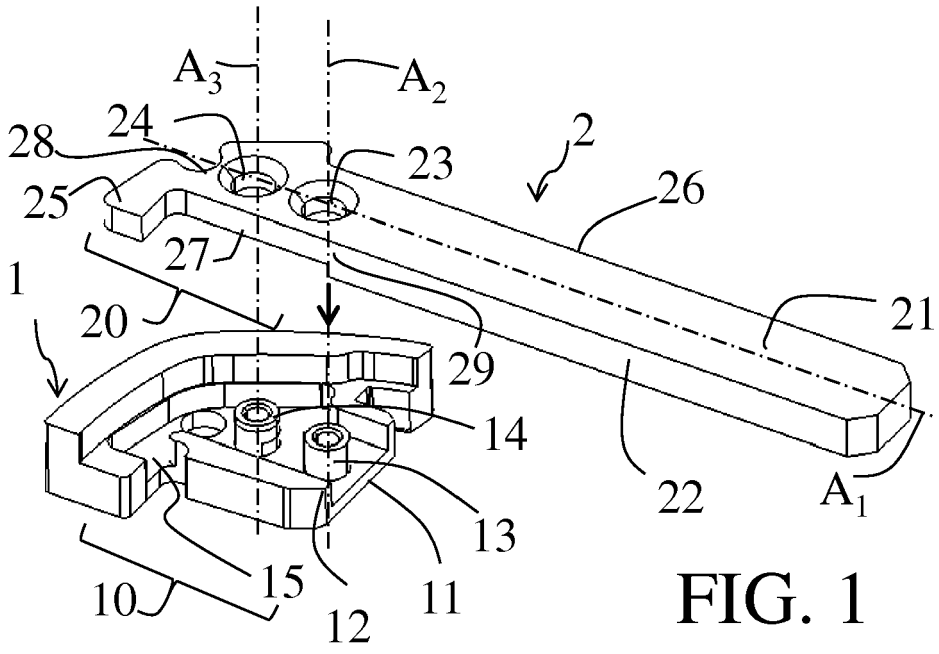

FIG. 1

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Description

[0001] The present invention relates to a vehicle key, in particular a hands-free vehicle key or badge, comprising an emergency key and the corresponding emergency key.

[0002] Hands-free vehicle keys are generally electronic keys comprising electronic means for identifying a user of a vehicle and the vehicle comprises activation means for unlocking a vehicle door and/or turning on a vehicle power when the user is identified. Such hands-free keys require a battery which implies a decreasing energy.

[0003] It is thus important that the hand-free key comprises an emergency key so that a user may open the vehicle door and turn on the vehicle power in case of loss of energy in the battery of the electronic key.

[0004] On one hand, when using the emergency key to open the door or to turn on the vehicle power, the emergency key needs to resist to torsion efforts. On the other hand, the emergency key is a secondary part of the hands-free key, there is thus a need for an emergency key with low manufacturing costs.

[0005] An emergency key has been proposed comprising a head and an insert. The head comprises a head connector and the insert comprises an insert connector. The insert connector is configured to be housed in the head connector in order to attach the insert to the head. To this end the head connector is pierced so as to receive the insert connector. In addition, the insert connector and the head connector are pierced so as to have aligned through-holes. A separate robust pin is then inserted in the through-holes of the head connector and of the insert connector and is sealed by means of an external sealing material so as to attach the head to the insert.

[0006] The emergency key of the prior art has the disadvantage of requiring a complicate machining and assembling of the emergency key. Indeed, it is required that the pierced through-hole of the head connector coincide with the through-hole of the insert connector such that the external pin may be inserted therein. Furthermore, an operator may lose the pin during the assembling of the emergency key.

[0007] Moreover, the emergency key of the prior art has the disadvantage of requiring much external material, including the robust external pin and an external sealing material. An operator needs to handle those external materials which implies a loss of time. These pin and sealing material increase the manufacturing costs of the emergency key.

[0008] An object of the invention is to propose an emergency key requiring a simpler machining of the head and of the insert, with a good resistance to torsion efforts and low manufacturing costs. Another object of the invention is to propose an emergency key with a minimum of external material, and a simplified assembling method of the emergency key.

[0009] To this end the invention relates to an emergency key comprising a head and an insert, wherein the head comprises a head connector and the insert comprises an insert connector, and the insert having a longitudinal axis, wherein the head connector and the insert connector are configured to interlock with each other by shape cooperation, and wherein the insert connector comprises at least one insert protuberance projecting from the longitudinal axis, and the head connector comprises at least one recess receiving said protuberance when the insert connector and the head connector interlock with each other.

[0010] Advantageously, the emergency key of the invention has a good resistance to torsion efforts due to the shape cooperation between the insert connector and the head connector as well as the cooperation between the projecting insert protuberance and the recess of the head connector.

[0011] In addition, the emergency key requires less external material and enables a simpler machining of the head and of the insert. Indeed, emergency key of the invention does not require pierced through-holes on the head connector and on the insert connector aligned to receive an external robust pin.

[0012] Moreover, the method according to an embodiment of the invention is simplified as there is no need to handle an external robust pin and an external sealing material. Furthermore, losing the pin during the assembling is avoided.

[0013] According to further embodiments which can be considered alone or in combination:

- the at least one insert protuberance projects perpendicularly to the longitudinal axis; and/or
- the head connector comprises at least one head protuberance, and the insert connector comprises at least one through-hole receiving said head protuberance when the insert connector and the head connector interlock with each other; and/or
- said at least one head protuberance is configured to be crimped in said through-hole, so as to attach the head connector and the insert together; and/or
- the head connector is in a plastic material, and the insert connector is in a metallic material; and/or
- the head connector and the insert connector comprise clip fastening means configured to attach the head and the insert together; and/or
- the head connector is in two parts and the insert connector is sandwiched between the two parts; and/or
- the insert connector comprises a connector end and a body end along the longitudinal axis, and the protuberance is placed at the connector end of the insert connector.

[0014] The invention further relates to an electronic key comprising electronic means for identifying a user of a vehicle, and the vehicle comprises activation means for unlocking a vehicle door and/or turning on a vehicle power when the user is identified, wherein the electronic key comprises an emergency key according to any of the

preceding claims, and the emergency key is configured to unlock the vehicle door and/or turn on the vehicle power.

[0015] Other features and advantages of the present invention will become apparent from the following description of non-limitative embodiments, with reference to the attached drawings in which:

- figure 1 is a perspective view of an emergency key according to an embodiment of the invention, where the key is disassembled;
- figure 2 is a perspective view of the emergency key of figure 1, where the key is assembled;
- figure 3 is a front view of an electronic key according to an embodiment of the invention.

[0016] Referring to figure 1, the emergency key according to a preferred embodiment of the invention comprises a head 1 and an insert 2.

[0017] The head 1 is configured to cooperate with edges of an electronic key such as a badge, in order to secure the emergency key in the electronic key. The head 1 comprises a head connector 10 configured to cooperate with the insert 2 to interlock the insert 2 with the head 1 by shape cooperation. Advantageously, a shape cooperation brings a good cohesion and fastening of the head connector 10 and the insert 2.

[0018] The insert 2 comprises a longitudinal body shaft 26 with one or more groove and/or notches (not represented) having a specific coding for actuating a lock cylinder of a vehicle, including notably a vehicle opening and/or a vehicle starter and/or a glove box.

[0019] The body shaft 26 of the insert 2 extends along a longitudinal axis A_1. The body shaft 26 of the insert 2 preferably has a substantially parallelepiped form with two opposite faces 21 and two opposite edges 22.

[0020] In particular, the insert 2 further comprises an insert connector 20 configured to cooperate with the head connector 10, to interlock the insert connector 20 with the head connector 10 by shape cooperation. The insert connector 20 comprises a connector shaft 27 in the extension of the body shaft 26. The limit between the connector shaft 27 and the body shaft 26 is the junction between the insert connector 20 and the head connector 10 when they interlock with each other.

[0021] For the shape cooperation, on one hand the insert connector 20, comprises at least one insert protuberance 25 projecting perpendicularly from the connector shaft 27 of the insert 2. In particular, the insert protuberance 25 projects perpendicularly from the axis A_1.

[0022] On the other hand, the head connector 10 comprises at least one recess 15 receiving the insert protuberance 25 when the insert connector 20 is interlocked with the head connector 10. Advantageously, the recess 15 and the insert protuberance 25 cooperate to produce a good resistance to torsion efforts to the emergency key, with reference to axis A_1. The resistance is further improved when the protuberance 25 projects perpendicularly from the longitudinal axis A_1.

[0023] The insert connector 20 further comprises a connector end 28 and a body end 29 along the longitudinal axis A_1. The connector end 28 is an extremity of the connector shaft 27 opposite to the body shaft 26. The body end 29 is the other extremity of the connector shaft 27. The body end 29 is a continuation of the body shaft 26. The insert connector 20 extends between the connector end 28 and the body end 29.

[0024] According to an embodiment, the protuberance 25 is placed at the connector end 28 of the insert connector 20.

[0025] According to another embodiment, the protuberance 25 may also be placed along the connector shaft 27 of the insert connector 20. More particularly, the protuberance 25 may in the middle of connector shaft 27 or at the body end 29.

[0026] As can be seen on figures 1 and 2, the protuberance 25 extends along a minor portion of the length of the connector shaft 27 of the insert connector 20 according to the longitudinal axis A_1.

[0027] According to another embodiment, the protuberance 25 may also extend along a major portion of the connector shaft 27 of the insert connector 20.

[0028] Moreover, for the shape cooperation, on one hand the head connector 10 comprises at least one head protuberance, and preferably two head protuberances 13, 14. The protuberances 12, 13 extend along parallel transversal axes A_2, A_3.

[0029] On the other hand, the insert connector 10, comprises at least one comprises at least one through-hole, preferably two through-holes 23, 24 receiving said head protuberances 13, 14 when the insert connector 20 and the head connector 10 interlock with each other. Advantageously, two or more protuberances and two or more through-holes 23, 24 improve the stability of the insert 2 with respect to a plane comprising axes A_2 and A_3. Moreover, the protuberances 13, 14 and the through-holes 23, 24 improve further the resistance to torsion efforts of the emergency key, with reference to axis A_1.

[0030] According to an embodiment, the transversal axes A_2 and A_3 are both perpendicular to the longitudinal axis A_1. Advantageously, this arrangement simplifies the assembly of the insert connector on the head connector 20.

[0031] The head protuberances 13, 14 and the through-holes 23, 24 are configured such that the protuberances 13, 14 may be crimped in the through-holes. Crimped protuberances can be seen in figure 2 (Reference 3).

[0032] The crimped portion of the protuberances is deformed so as to fit closely the corresponding end of the through-hole 23, 24. This leads to a firm fixation and holding of the head 1 with the insert 2.

[0033] The head protuberances 13, 14 are preferably made of a plastic material such that the crimping easier as it requires less energy than for example a metallic material.

[0034] The insert preferably made of a metallic material. The metallic insert simplifies further the crimping as there is no need to avoid spoiling the insert by a crimping apparatus for the head because the crimping may be done below the melting temperature of the insert. Moreover a metallic insert is more robust so as to resist torsion efforts when using the emergency key.

[0035] Alternatively the head connector 10 and the insert connector 20 comprise clip fastening means (non-represented) configured to attach the head connector 10 and the insert connector 20 together. To this end, one or more clip protuberance may be provided on the insert connector 20 and/or on the head connector 10. The clip fastening means entails a rapid fastening of the head with the insert 2 in comparison to screws for example.

[0036] According to another alternative non-represented embodiment, the head connector 10 is in two parts and the insert connector 20 is sandwiched between the two parts. The head connector 10 in two parts hides the connection between the insert and the head for aesthetical purposes. The two parts may be attached by clip fastening means on the head connector 10 and/or on the insert connector 20 or another fastening means such as screws.

[0037] Referring now to figure 3, the emergency key is part of an electronic key 4 such as a badge, comprising electronic means 5 for example for identifying a user of a vehicle, and the vehicle comprises activation means for unlocking a vehicle door and/or turning on a vehicle power when the user is identified. The emergency key further comprises a battery (not represented).

[0038] The emergency key is configured to be housed in the electronic key 4. In case of loss of energy in the battery, the emergency key is removed out of the electronic key 4 and may be used to unlock the vehicle door and/or turning on the vehicle power.

Claims

1. Emergency key comprising a head (1) and an insert (2),
   wherein the head comprises a head connector (10) and the insert comprises an insert connector (20), and the insert (2) having a longitudinal axis (A_1),
   wherein the head connector (10) and the insert connector (20) are configured to interlock with each other by shape cooperation, and
   wherein the insert connector (20) comprises at least one insert protuberance (25) projecting from the longitudinal axis (A_1), and the head connector (10) comprises at least one recess (15) receiving said protuberance (25) when the insert connector (20) and the head connector (10) interlock with each other.

2. Emergency key according to the preceding claim, wherein the at least one insert protuberance (25) projects perpendicularly to the longitudinal axis (A_1).

3. Emergency key according to any of the preceding claims, wherein the head connector (10) comprises at least one head protuberance (13, 14), and the insert connector (20) comprises at least one through-hole (23, 24) receiving said head protuberance (13, 14) when the insert connector (20) and the head connector (10) interlock with each other.

4. Emergency key according to any of the preceding claims, wherein said at least one head protuberance (13, 14) is configured to be crimped in said through-hole (23, 24), so as to attach the head connector (10) and the insert (20) together.

5. Emergency key according to any of the preceding claims, wherein the head connector (10) is in a plastic material, and the insert connector (20) is in a metallic material.

6. Emergency key according to any of the preceding claims, wherein the head connector (10) and the insert connector (20) comprise clip fastening means configured to attach the head (1) and the insert (2) together.

7. Emergency key according to any of the preceding claims, wherein the head connector (10) is in two parts and the insert connector (20) is sandwiched between the two parts.

8. Emergency key according to any of the preceding claims, wherein the insert connector (20) comprises a connector end (28) and a body end (29) along the longitudinal axis (A_1), and the protuberance (25) is placed at the connector end of the insert connector (20).

9. Electronic key (4) comprising electronic means (5) for identifying a user of a vehicle, and the vehicle comprises activation means for unlocking a vehicle door and/or turning on a vehicle power when the user is identified, wherein the electronic key comprises an emergency key according to any of the preceding claims, and the emergency key is configured to unlock the vehicle door and/or turn on the vehicle power.

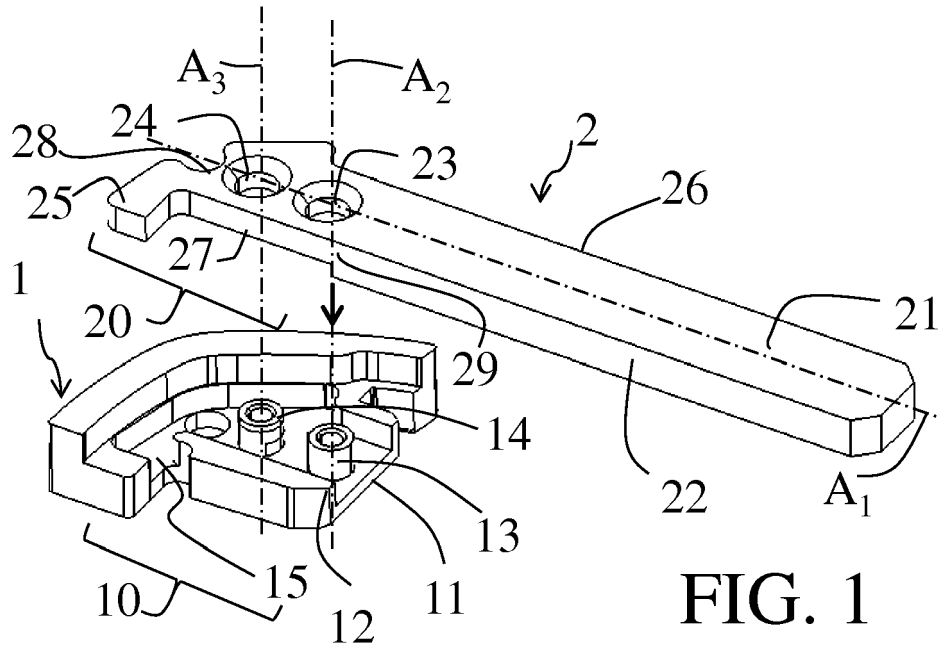

FIG. 1

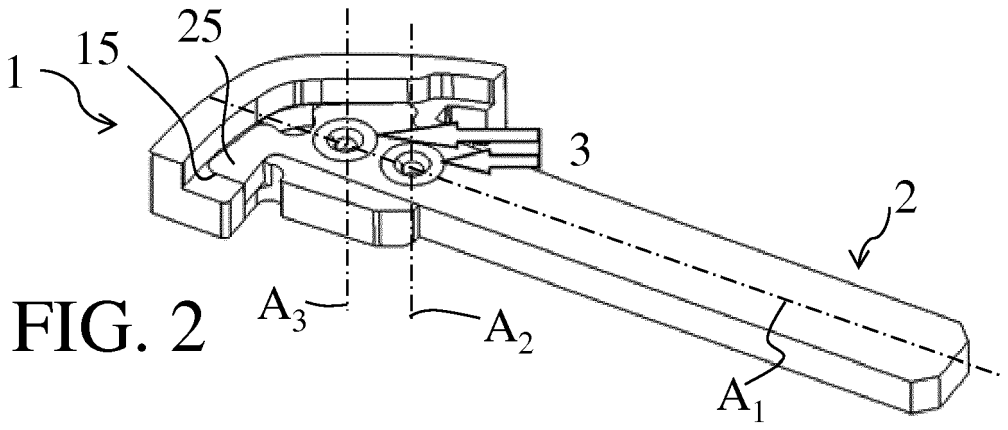

FIG. 2

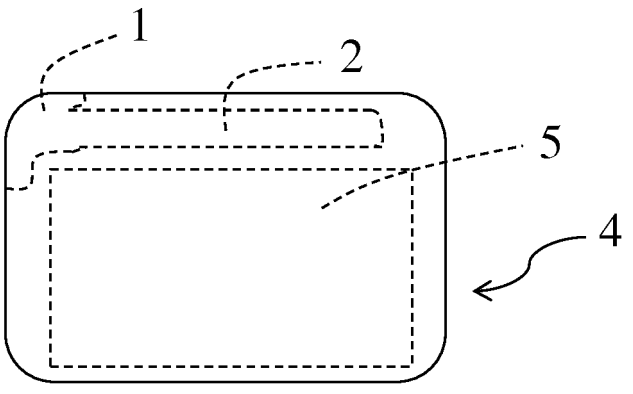

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 15 17 5766

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 January 2016	Antonov, Ventseslav

CATEGORY OF CITED DOCUMENTS

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