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## Description

### TECHNICAL FIELD

**[0001]** The present invention relates to a key arrangement according to the preamble of claim 1. The key arrangement according to the invention Is particularly adapted for use with vehicles.

### BACKGROUND OF THE INVENTION

**[0002]** These days it is common to use a key arrangement for unlocking a vehicle. To avoid having to carry separate key and transmitter components the key and the transmitter are often combined as a unit in a housing. The housing may be provided as two housing parts assembled together with screws or a snap-in closure. For example, the key arrangement may be used for activating and deactivating the alarm of the vehicle, locking and unlocking the doors and as an ignition key.

**[0003]** US Patent No. 5331325 discloses a key-configured transmitter apparatus comprising a key-shaped housing and a key. The key serves the dual purpose of a real key such as for operating the vehicle's ignition and also as an antenna for radiating the oscillator signal produced by the transmitter. The housing comprises electronic components and is closed using three screws. Two of the screws attach the key to the housing. The screw heads project from the housing, which can result in that the cloth in a jacket pocket, or the like, can snag on the screw head, which can tear a hole in the cloth. Furthermore, dirt can get stuck in the notches of the screw head. In addition, the fact that the screws are visible can be deemed by some users to be unattractive.

**[0004]** US Patent No. 5855050 discloses a method and system for installing a signal transmitter to a key blank so that control function signals can be transmitted by the transmitter to an operating device. The system comprises a housing, a transmitter unit and a punch unit. The punch unit comprises a key. The key has a head part and an elongated shank part. The housing is closed using at least one screw and the screw head projects from the housing.

**[0005]** US patent No. 4888970 discloses a key unit including a transmitter for remote actuation of a lock and, In a common housing, a mechanical key for mechanical operation of the lock. The mechanical key is held within a key compartment in the housing and, when a trigger button is depressed, pivots to an outwardly extending working position on a circular bearing portion. The cover of the housing is held to the lower portion at one location by a bayonet connection which enables the cover to be pivoted to a position for access to the battery compartment in which batteries are contained for the transmitter. A lack connection spaced from the bayonet connection couples the cover to the lower housing portion when closed, and a removable locking screw is provided to hold the cover In the closed position.

**[0006]** A combined mechanical end electronic key is known from WO-A-0148342. Electronic components and a mechanical flat key are housed in a common housing. In order to place the flat key between a retracted rest position in the housing and a projecting in-use position, the flat key is movably located in the housing and secured in at least one of said positions by a push button. The housing is provided with a snap-in closure. A disadvantage of using a snap-in closure is that it is normally not as secure as a closure with a screw. For example, if the user drops the key there is a greater risk that the housing falls apart. Another disadvantage is that the housing may not necessarily be as tight-fitting as a housing closed with a screw, which results in that the housing closed with a snap-in closure is more sensitive to damp.

**[0007]** Common for the above described key arrangements is that they are battery-operated and that the battery is arranged within the housing. The housing is closed with either one or several screws or with a snap-in closure. When the battery has to be exchanged, the user has to open the housing to replace the battery.

**[0008]** An advantage with a snap-in closure is that no unattractive screw heads are present, which project from the housing. On the other hand an advantage with a screw closure is that it is secure.

### SUMMARY OF THE INVENTION

**[0009]** It is therefore an object of the invention is to provide a key arrangement which combines the advantages of using a snap-in closure with the advantages of closing the housing with a screw. This object is achieved by means of providing the key arrangement of claim 1. This results In a aesthetical appealing, secure and tight-fitting key arrangement, with no projecting screw heads.

**[0010]** Further embodiments of the present invention are detailed in the dependent claims.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0011]** In the following, the invention will be described in a non-limiting way with reference to preferred embodiments of the invention in conjunction with the enclosed drawings, in which:

Fig. 1 shows a schematic illustration of a key arrangement according to a first embodiment of the invention,
Fig. 2 shows a schematic illustration of the back side of the key arrangement in Fig.1,
Fig. 3 shows a schematic cross-section Illustration of the key arrangement in Fig. 1,
Fig. 4a shows a schematic Illustration of the key arrangement, in a first position, according to a second embodiment,
Fig. 4b shows a schematic illustration of the key arrangement in Fig. 4a, in a second position,
Fig. 5a shows a schematic illustration of the key arrangement, in a first position, according to a third embodiment,
Fig. 5b shows a schematic illustration of the key arrangement in Fig 5a, in a second position.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

**[0012]** In the following, several embodiments of the invention and modifications thereof will be described in detail and with reference to the enclosed drawings. Further examples of other possible embodiments will also be described.

**[0013]** Fig. 1 is a schematic representation of a key arrangement, denoted 10 in the drawings, according to a first embodiment of the invention. The key arrangement 10 comprises a remote entry transmitter 12, a housing 14 and at least one key 16. Different standard types of remote entry transmitters available on the market, of which a skilled person is aware, can be used in the key arrangement 10 according to the invention. The remote entry transmitter is preferably battery-operated (not shown) and accommodated in the housing 14. The housing is preferably made of some kind of plastic material but can, at least partially, be made of metal materials, such as aluminium, or the like. The length of the housing is preferably between forty to seventy millimetres (40-70 mm) and the width between thirty to fifty millimetres (30-50 mm). The housing 14 is made of a plurality of components, including a first housing part 18 and a second housing part 20. The first housing part 18 and the second housing part 20 are held together by at least one screw 22 having a screw head 24. The term "screw" is hereby intended to include any rotatably releasable fastener. In addition to the screw 22 other attachment means like a pin or a plug, or the like, can be used. The diameter of the screw 22 can be between approximately one and five millimetres (1-5 mm), preferably between two and three millimetres (2-3 mm).

**[0014]** As has been mentioned above the key arrangement 10 comprises at least one key 16. In one embodiment as illustrated in Fig 1, 2 and 3, the key arrangement 10 may comprise two keys, e.g. an ignition key 17 which is substantially fixed in the housing, and a backup key 16 which is removable from the housing 14 and preferably totally removable from the housing 14, see Fig. 1. While describing the present embodiment, illustrated in Fig. 1, 2 and 3, the key 16 refers to the backup key. The ignition key 17 is preferably as short as possible, for making the key arrangement 10 as small and neat as possible. The ignition key 17 may be between twenty to thirty millimetres (20-30 mm), preferably twenty-five to twenty-eight millimetres (25-28 mm). The backup key 16 can be used for opening and/or starting the vehicle if the battery of the remote entry transmitter 12 is flat. Other fields of application for the backup key 16 are if the user hands in the vehicle for repair or hands over the vehicle for valet parking. The user can remove the backup key 16 and hand it over and retain the rest of the key arrangement. The key 16 can be provided with on-moulded plastic or rubber material, or the like, to avoid allergic reaction, for example if the user is allergic to nickel. The width of the key 16 in one non-limiting example may be between five and seven millimetres (5- 7 mm). The length of the key 16 may be between forty and fifty millimetres (40-50 mm), more preferably forty-three to forty-six millimetres (43-46 mm). The key 16 may be substantially flat and between one and three millimetres (1-3 mm) thick. The length of the key blade of the key 16 will dictate the length of the housing 14 when the housing 14 is extended to cover the key blade of the key 16, or the entire key 16.

**[0015]** Fig.1 further shows how the key 16 can be arranged inside the housing 14. The key 16 is displaceably arranged with respect to the housing 14 between a first position and a second position. In the first position the screw head 24 is covered by a part of the key 16. In the second position the screw head 24 is exposed i.e. it can be accessed by a user. The first position is when the key 16 is not in use and is retained in the housing 14. In the embodiment according to Fig. 1-3, the second position is when the key 16 is totally removed from the housing 14 and possible to use. The key 16 can be provided with or without a key hole 26, wherein a key ring can be attached, which can be practical for the user when carrying the key 16 while removed from the housing 14 or the entire key arrangement 10 when the key 16 is positioned in the housing 14.

**[0016]** In Fig. 2 the key arrangement according to Fig. 1 is shown with the key 16 in the first position, not in use, within the housing 14. The first housing part 18 is provided with a through-hole 28. The through-hole 28 is approximately between one and five millimetres (1-5 mm), preferably two and three millimetres (2-3 mm). The screw head 24 is accessible via the through-hole 28 once the key 16 has been removed from the housing, i.e. it is in its second position.

**[0017]** Fig. 3 shows a schematic cross-section of the key arrangement 10, when the key 16 is removed from the housing 14. The first housing part 18 comprises a first surface 19 and a second surface 21, which defines opposed walls, which together with a base 30 at least partially defines a recess 32. The recess 32 is arranged for accommodating the key 16 in the first position, in which first position the key 16 is retained in the housing 14. The remote entry transmitter 12 is accommodated at least partially within the first housing part 18. When its battery is to be exchanged, the user unscrews the screw 22 and opens the housing 14 to replace the battery. The screw head 24, which is arranged substantially coaxially with the through-hole 28, is accessible via the through-hole 28 and the recess 32, for example by

means of a screwdriver, or the like.

**[0018]** The second housing part 20 is provided with at least one in-moulded screw nut 34, which screw nut 34 is arranged to receive the screw 22. The screw nut 34 is preferably made of any suitable type of metal material for example, steel material or the like, though it may also be made of hard plastic or rubber materials, or the like. The second housing part 20 is further provided with several push buttons 36 communicating with the remote entry transmitter 12, which may be used for locking and unlocking a vehicle, activating and deactivating an alarm of the vehicle, and the like.

**[0019]** In Figs. 4a and 4b, a key arrangement according to a second embodiment is shown, in which the key 16 serves the dual purpose of an ignition key and a backup key combined in one common key. The key 16 is slidably displaceably arranged with respect to the housing 14. In a first position, while not in use, the key 16 has been, substantially totally contained in the housing, see Fig. 4a. In a second position, while in use, the key 16 is partially displaced with respect to the housing 14, see Fig. 4b, to hereby project from the housing 14. The housing 14 is provided with a through-hole 28 for access to a (not shown) screw corresponding to the screw 22 of Fig. 3. The housing 14 can be provided with a stop/lock push button or a spring arrangement, or the like (not shown). If it is provided with a stop/lock push button, the user presses the stop/lock button and a part of the key 16 is exposed, see Fig. 4b. The key 16 can then be used. A snap-in closure, or spring arrangement or the like, can secure the key 16 the extended, second position. When the user presses the stop/lock push button, the snap-in closure is unlocked. The user can then press the key 16 into the housing 14, see Fig. 4a. In another example the key 16 may be pushed in and out of the housing 14 manually by means of a spring arrangement (not shown). If the housing is provided with a spring arrangement, the key 16 can be rolled in and out of the housing, between the first and the second position.

**[0020]** In Fig. 5a and Fig. 5b a key arrangement according to a third embodiment is shown, in which the key 16 can be an ignition key and a backup key combined in one common key. The key 16 is pivotally displaceably arranged with respect to the housing 14. The in-moulded screw nut 34 is arranged in the second housing part 20. The through-hole 28 is arranged in the first housing part 18. The first housing part 18 and the second housing part 20 define a recess 32 together with the base 30 (not shown). The key 16 is pivotally arranged to be pivoted around a pivot pin 38, or the like, with respect to the housing 14. In a first position, when key is not in use, see Fig 5 b, the key 16 is located in the recess 32, and the screw head 24 is covered by a part of the key 16. In a second position, when the key 16 is possible to use, see Fig. 5b, the key 16 is displaced with respect to the housing 14 and projects from the housing. The screw head 24, which is arranged substantially coaxially with the through-hole 28, becomes accessible for the user via the through-hole 28 and the recess 32.

**[0021]** The present invention has now been described by means of a various embodiment and modifications thereof. However the invention is not limited to the illustrated embodiments, but variants and other modifications are also possible within the scope of the appended claims. The scope of the claims also includes the use of the key arrangement 10 for effecting entry into a vehicle according to the appended claims.

REFERENCE SIGNS

**[0022]**

| | |
|---|---|
| key arrangement | 10 |
| remote entry transmitter | 12 |
| housing | 14 |
| key | 16 |
| Ignition key | 17 |
| first housing part | 18 |
| first surface | 19 |
| second housing part | 20 |
| second surface | 21 |
| screw | 22 |
| screw head | 24 |
| key hole | 26 |
| through-hole | 28 |
| base | 30 |
| recess | 32 |
| screw nut | 34 |
| push buttons | 36 |
| pivot pin | 38 |

## Claims

1. A key arrangement (10) comprising a remote entry transmitter (12) accommodated in a housing (14), and at least one key (16), said housing (14) being made of at least a first housing part (18) and a second housing part (20), said first housing part (18) and said second housing part (20) being held together by at least one rotatably releasable fastener (22) having a fastener head (24), said at least one key (16) is displaceably arranged with respect to said housing (14) between a first position and a second position such that in said first position a part of said key (16) covers said fastener head (24), and in said second position said fastener head (24) is exposed, said first housing part (18) at least partially defines a recess (32) for accommodating said key (16) in said first position, said fastener head (24) being accessible via said recess (32), said recess (32) has a base (30) and opposed side walls (19, 21), ***characterised in***
**that** said housing (14) is provided with a through-hole (28) into said recess (32), said fastener head (24) being arranged substantially coaxially with said through-hole (28) in one of said opposed walls (19, 21).

2. The key arrangement according to claim 1,
***characterised in***
**that** said key (16) is slidably displaceably arranged with respect to said housing (14).

3. The key arrangement according to claim 2,
***characterised in***
**that** said key (16) is removable from said housing (14).

4. The key arrangement according to claim 1,
***characterised in***
**that** said key (16) is pivotally displaceably arranged with respect to said housing (14).

5. The key arrangement according to any one of the preceding claims,
***characterised in***
**that** said key (16) is a vehicle ignition key.

6. The key arrangement according to any one of claims 1-4,
***characterised in***
**that** said key (16) is a vehicle backup key.

7. The key arrangement according to claims 5-6,
***characterised in***
**that** said vehicle ignition key and said vehicle backup key are combined in one common key.

8. Use of the key arrangement according to any one of the preceding claims for effecting entry into a vehicle.

## Patentansprüche

1. Schlüsselanordnung (10), die einen in einem Gehäuse (14) aufgenommenen Fernzugangssender (12) und wenigstens einen Schlüssel (16) umfasst, wobei das Gehäuse (14) aus wenigstens einem ersten Gehäuseteil (18) und einem zweiten Gehäuseteil (20) hergestellt ist, wobei der erste Gehäuseteil (18) und der zweite Gehäuseteil (20) durch wenigstens eine durch Drehen lösbare Befestigungseinrichtung (22) mit einem Befestigungskopf (24) zusammengehalten werden, wobei der wenigstens eine Schlüssel (16) in Bezug auf das Gehäuse (14) zwischen einer ersten Position und einer zweiten Position verlagerbar angeordnet ist, so dass in der ersten Position ein Teil des Schlüssels (16) den Befestigungskopf (24) abdeckt und in der zweiten Position der Befestigungskopf (24) freiliegt, wobei der erste Gehäuseteil (18) wenigstens teilweise eine Aussparung (32) für die Aufnahme des Schlüssels (16) in der ersten Position definiert, wobei der Befestigungskopf (24) über die Aussparung (32) zugänglich ist, wobei die Aussparung (32) eine Grundfläche (30) und gegenüberliegende Seitenwände (19, 21) besitzt,
**dadurch gekennzeichnet,**
**dass** das Gehäuse (14) mit einem Durchgangsloch (28) in die Aussparung (32) versehen ist, wobei der Befestigungskopf (24) im Wesentlichen koaxial zu dem Durchgangsloch (28) in einer der gegenüberliegenden Wände (19, 21) angeordnet ist.

2. Schlüsselanordnung nach Anspruch 1,
**dadurch gekennzeichnet,**
**dass** der Schlüssel (16) in Bezug auf das Gehäuse (14) gleitend verlagerbar angeordnet ist.

3. Schlüsselanordnung nach Anspruch 2,
**dadurch gekennzeichnet,**
**dass** der Schlüssel (16) aus dem Gehäuse (14) entnehmbar ist.

4. Schlüsselanordnung nach Anspruch 1,
**dadurch gekennzeichnet,**
**dass** der Schlüssel (16) in Bezug auf das Gehäuse (14) schwenkbar verlagerbar angeordnet ist.

5. Schlüsselanordnung nach einem der vorhergehenden Ansprüche,
**dadurch gekennzeichnet,**
**dass** der Schlüssel (16) ein Fahrzeugzündschlüssel ist.

6. Schlüsselanordnung nach einem der Ansprüche 1-4,
**dadurch gekennzeichnet,**
**dass** der Schlüssel (16) ein Fahrzeugreserveschlüssel ist.

7. Schlüsselanordnung nach den Ansprüchen 5-6,
**dadurch gekennzeichnet,**
**dass** der Fahrzeugzündschlüssel und der Fahrzeugreserveschlüssel zu einem gemeinsamen Schlüssel kombiniert sind.

8. Verwendung der Schlüsselanordnung nach einem der vorhergehenden Ansprüche zum Ausführen eines Zugangs in ein Fahrzeug.

## Revendications

1. Dispositif de clé (10) comportant un émetteur d'entrée à distance (12) adapté dans un logement (14), et au moins une clef (16), ledit logement (14) étant fait d'au moins une première partie de logement (18) et d'une deuxième partie de logement (20), ladite première partie de logement (18) et ladite deuxième partie de logement (20) étant maintenues ensemble par au moins une attache escamotable par rotation (22) ayant une tête d'attache (24), ladite clef (16) est montée mobile par rapport audit logement (14) entre une première position et une deuxième position de manière que dans ladite première position une partie de ladite clef (16) couvre ladite tête d'attache (24) et dans la seconde position ladite tête d'attache (24) soit apparente, ladite première partie de logement (18) définit au moins partiellement une cavité (32) pour adapter ladite clef (16) dans ladite première position, ladite tête d'attache (24) étant accessible par l'intermédiaire de ladite cavité (32), ladite cavité (32) possédant une base (30) et des parois latérales opposées (19, 21),
**caractérisé en ce que**
ledit logement (14) est équipé d'une ouverture traversante (28) dans ladite cavité (32), la tête d'attache (24) étant arrangée essentiellement de manière coaxiale avec ladite ouverture traversante (28) dans une desdites parois opposées (19, 21)

2. Dispositif de clé selon la revendication 1,
**caractérisé en ce que**
ladite clef (16) est montée de façon coulissante par rapport audit logement (14).

3. Dispositif de clé selon la revendication 2,
**caractérisé en ce que**
ladite clef (16) est démontable dudit logement (14).

4. Dispositif de clé selon la revendication 1,
**caractérisé en ce que**
ladite clef (16) est montée pivotante par rapport audit logement (14).

**5.** Dispositif de clé selon l'une des revendications précédentes,
**caractérisé en ce que**
ladite clef (16) est une clef d'allumage de véhicule.

**6.** Dispositif de clé selon l'une des revendications 1 à 4,
**caractérisé en ce que**
ladite clef (16) est une clef de protection de véhicule.

**7.** Dispositif de clé selon l'une des revendications 5 ou 6,
**caractérisé en ce que**
ladite clef d'allumage de véhicule et ladite clef de protection du véhicule sont combinées dans une seule clef.

**8.** Utilisation du dispositif de clé selon l'une quelconque des revendications précédentes pour effectuer l'entrée dans un véhicule.

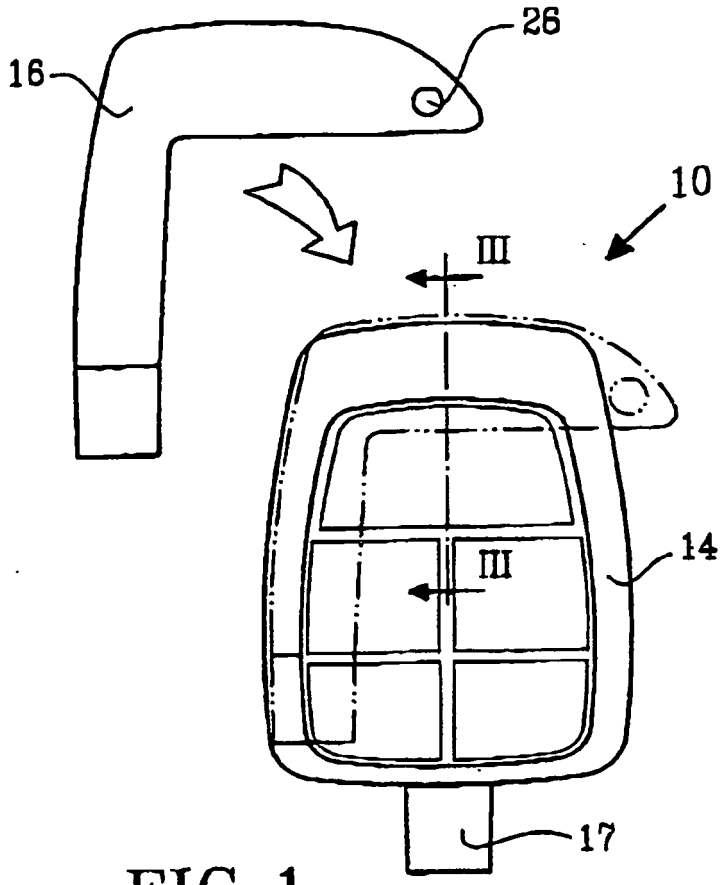


FIG.1

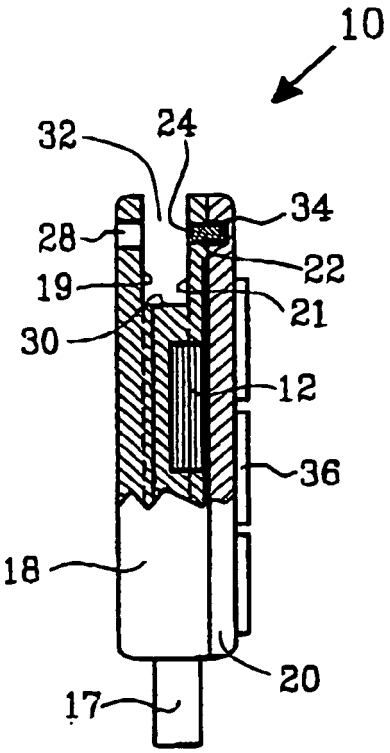


FIG.3

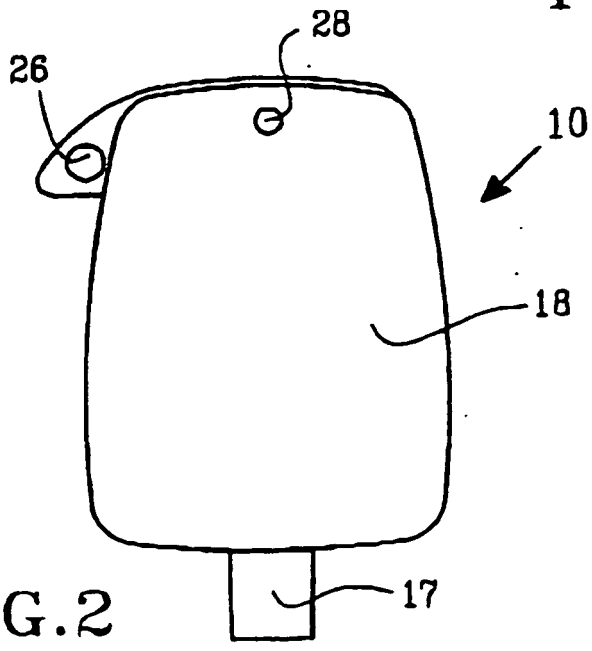


FIG.2

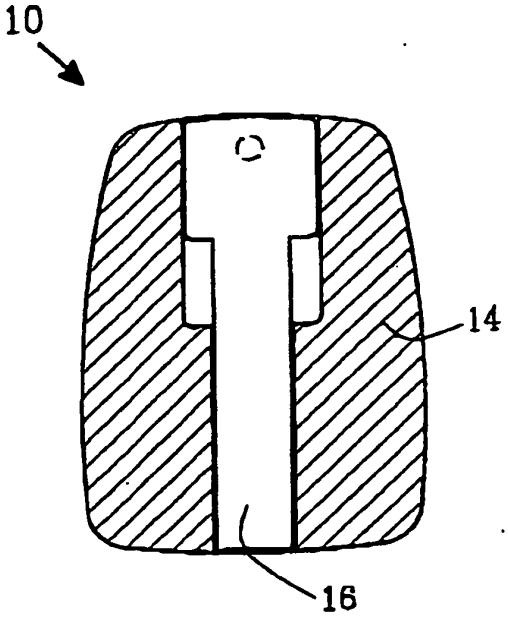


FIG.4a

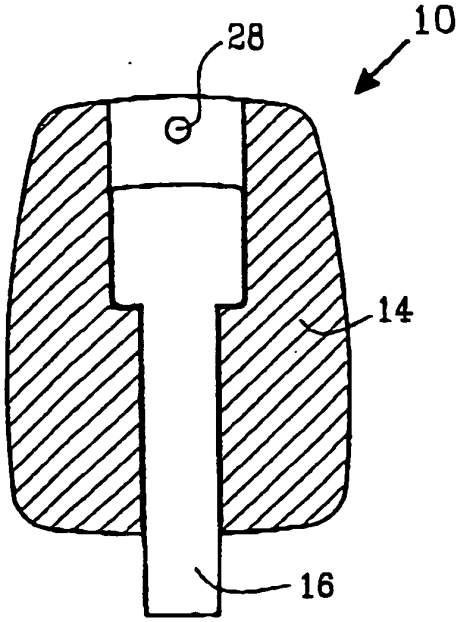


FIG.4b

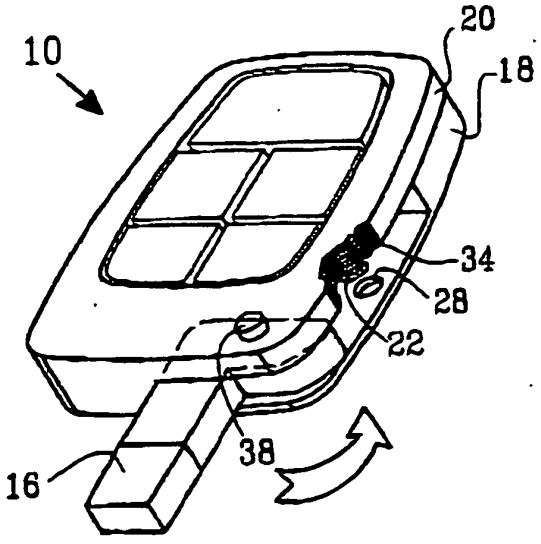


FIG.5a

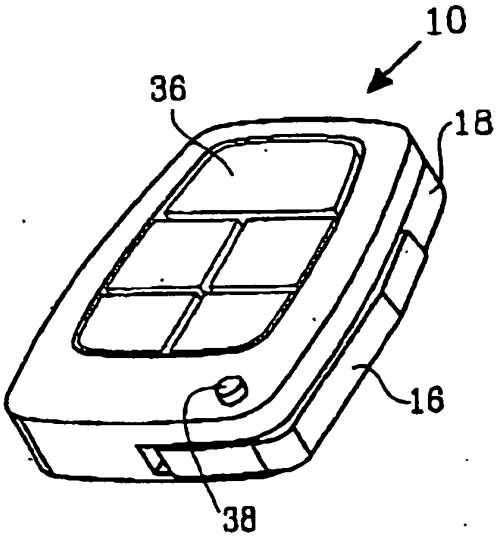


FIG.5b

## REFERENCES CITED IN THE DESCRIPTION

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- US 5855050 A **[0004]**
- US 4888970 A **[0005]**
- WO 0148342 A **[0006]**