

Description

BACKGROUND OF THE INVENTION

The present invention relates to a housing and holder assembly applicable to any kinds of portable electrical apparatuses such as a radio pager or similar portable communication apparatus.

An apparatus of the kind described is in many cases put on a person's waist belt or in a breast pocket through a holder which is provided on a housing of the apparatus. The holder is customarily implemented by a butterfly clip which is securely connected to the housing to be opened and closed as needed or an independent portable holder in which the apparatus may be bodily received. On the other hand, there is an increasing demand for a clip which is removable from the apparatus housing depending upon the application, and a removable clip which meets such a demand is predominant in the market. However, the prior art holders are difficult to attach and detach and therefore apt to be scratched or even seriously damaged. Further, they are bulky and therefore poor in portability, expensive, and not attractive in appearance.

In the specification of United States patent specification No. 4,083,481, which was published on April 11 1978, there was proposed a detachable mounting clip, especially suited for application with miniaturised radio apparatus, the clip having a base plate assembly which is tapered and arranged to be inserted into and retained by corresponding ridges on the housing of the apparatus, the assembly being held in position by a resilient finger which engages serrations on the housing.

A particular embodiment of the invention to be described provides a housing and holder assembly for a radio pager or like portable communication apparatus which promotes easy attachment and detachment of a holder from a housing, enhances portability and attractive appearance, and minimises the fear of damage during attachment and detachment.

A housing and holder assembly to be described below by way of example includes a housing accommodating the apparatus, a battery cover forming a part of the housing and slidable relative to the housing into and out of engagement with the housing, the battery cover closing a bore which is defined in the housing for receiving a battery which powers the apparatus, a holder removably mounted on the housing and, when mounted on the housing, engaging both of the housing and the battery cover, and a locking device for, when the holder is mounted on the housing, locking the holder in position such that the battery cover is removable from the housing with the holder being held in engagement with the housing.

Previously proposed arrangements, together with embodiments of the invention which are given by way of example, will now be described with reference to the accompanying drawings in which:

Figs. 1, 2, 3A and 3B are views showing examples of a prior art housing and a prior art holder which are used with a radio pager;

Fig. 4 is an exploded perspective view of a housing and holder assembly in accordance with the present invention;

Fig. 5 is a partly sectional side elevation of the housing and holder assembly as shown in Fig. 4;

Fig. 6A is an enlarged view of a portion A which is shown in Fig. 5;

Fig. 6B is an enlarged view of a portion B which is also shown in Fig. 5;

Fig. 6C is an enlarged view of a portion C which is also shown in Fig. 5; and

Figs. 7A and 7B are bottom views schematically showing how a holder of the housing and holder assembly of the present invention may be attached and detached.

DESCRIPTION OF THE PREFERRED EMBODIMENT

To better understand the present invention, a brief reference will be made to prior art holders which are applicable to a radio pager.

Referring to Fig. 1, a prior art holder 10 has a generally holster-like configuration and accommodates a body 12A of a radio pager 12 therein. The holder 10 is usually formed from plastic. A clip 14 is securely mounted on the back of the holder 10 and not directly mounted on the pager body 12A. Fig. 2 shows another prior art implementation in which an independent clip 64 is slidably engaged with rails 66 that are provided on the back of a body 62A of a radio pager 62. The clip 14 shown in Fig. 2 is removable from the pager body 62A as desired. Fig. 3A shows a farther prior art implementation in which a holder 70 is provided with a clip 74 thereon and removable from a body 72A of a radio pager 72. The holder 70 of Fig. 3A is comprised of a molding of plastic and includes a plurality of projections 74a and 74b. To attach the holder 70 of Fig. 3A to the pager body 72A, the projections 74a and 74b are respectively mated with recesses 72a and 72b which are provided at side portions and a bottom portion of the pager body 72A. The holder 70 of Fig. 3A may be removed from the pager body 72A by forcibly deforming the projection 74a away from the pager body 72A.

The holster-like holder 10 shown in Fig. 1 suffers from a drawback that although the pager body 12A itself may be small size, the holder 10 adapted

to accommodate the pager body 12A is larger than the pager body 12A. Eventually, the whole radio pager 12 is bulky and poor in portability. In addition, this kind of holder 10 is usually produced on option basis and therefore more expensive than ordinary clips. The implementation shown in Fig. 2 allows the clip 64 to be directly mounted on the pager body 62A without substantially increasing the overall dimensions of the pager 62. However, when the clip 64 is removed from the pager body 62A, the rails 66 on the pager body 62A show themselves to impair the appearance of the pager 62 and are apt to allow dust and other impurities thereinto. The implementation shown in Figs. 3A and 3B is advantageous over that of Fig. 2 in that the rails 66 are absent on the pager body 72A even when the holder 70 is removed from the pager body 72A. Nevertheless, the holder 70 of Figs. 3A and 3B cannot be removed from the pager body 72A without being forcibly deformed by means of tweezers or the like, as stated earlier with reference to Fig. 3B. This is apt to scratch the pager body 72A and even break the flat holder 70.

Referring to Figs. 4, 5, 6A and 6C, 7A and 7B, a housing and holder assembly in accordance with the present invention is shown and generally designated by the reference numeral 20. In the illustrative embodiment, the housing and holder assembly 20 is applied to a radio pager by way of example. As shown, the housing and holder assembly 20 is generally made up of a housing 24 of a radio pager 22, a holder 26 removably mounted on the housing 24, and a clip 28 mounted on the holder 26. A battery (not shown) for powering the pager 22 is received in a bore 30 which is defined in a side bottom portion of the housing 24. A battery cover 32 is provided for closing the bore 30 and slidable laterally, i.e., in a direction indicated by an arrow in Fig. 4 into and out of engagement with the housing 24. Provided atop the housing 24 is an operating section 34 of the pager 22. Buttons 36 each being accessible for a particular operation are arranged in the operating section 34. The operating section 34 is configured into a shallow recess to eliminate erroneous operations. A single first channel 38 extends throughout a part of the bottom of the housing 24 and a part of the battery cover 32 and in parallel to the sliding direction of the battery cover 32. A second channel 40 is provided in an intermediate portion of the back of the housing 24.

Made of plastic, the holder 26 is produced by forming to have a profile which is generally complementary to that part of the housing 24 which includes a top corner portion, back and bottom. A seat 42 is provided on the back of the holder 26. The clip 28 is mounted to the seat 42 through a spring 44 and a spring pin 46. In this configuration, the clip 28 is rotatably about the spring pin 46 in a

butterfly motion to promote easy attachment of the holder 26 to a person's waist belt 48 (Fig. 5). Projections 50 and 52 respectively extend from the upper and lower ends of the holder 26 toward the housing 24. When the holder 26 is attached to the housing 24, the projections 50 and 52 are respectively elastically engaged with a shoulder 34a which is defined in the operating section 34 of the housing 24 and the first channel 38. A lug 54 (Fig. 6B) extends from an intermediate portion of the front of the holder 26, i.e., a position where it faces the second channel 40. This lug 54 serves to prevent the holder 26 from being dislocated when mated with the second channel 40.

As shown in Figs. 5 and 6A to 6C, when the holder 26 is sequentially rotated with its upper projection 50 being engaged with the shoulder 34a of the operating section 34, the lower projection 52 of the holder 26 is caused to mate with the first channel 38 due to the elasticity of plastic. In this position, the holder 26 and the housing 24 firmly retain each other. The lug 54 of the holder 26 is mated with the second channel 40 of the housing 24 to restrain the holder 26 from lateral dislocation. If desired, the holder 26 may be mounted to the housing 24 by hooking the lower projection 52 to the first channel 38 and then rotating the holder 26 until the upper projection 50 engages the shoulder 34a.

To remove the holder 26 from the housing 24, the battery cover 32 is slid laterally out of the housing 24, as shown in Figs. 7A and 7B. As the lower projection 52 of the holder 26 is released from the part of the first channel 38 which is provided on the battery cover 32, that part of the projection 52 which faces the bore or battery chamber 30 may be pushed upward by finger. In this manner, when the battery cover 32 is removed from the housing 24, the holder 26 can be dismounted from the housing 24 simply by touching the projection 52. Since such an operation is effected by finger, the housing 24 and holder 26 are protected against scratches. The fact that the projection 52 is partly left in the other part of the first channel 38 which is provided on the housing 24 when the battery cover 32 is removed is effective in preventing the holder 26 from being entirely separated from the housing 24 when the battery cover 32 is removed.

Preferably, the bore 30 of the housing 24 is dimensioned such that a battery can be replaced simply by removing the battery cover 32. This would eliminate the need for removing the holder 26 every time a battery should be replaced. After the replacement of a battery, the battery cover 32 is again slid into engagement with the housing 24 resulting in the holder 26 being firmly attached to the housing 24.

When the holder 26 is put on the waist belt 48 or the like, it is hardly visible from the outside because it is mounted only on the substantially intermediate portion of the back of the pager 22, i.e., the pager 22 does not seem bulky at all despite the presence of the holder 26. The holder 26 which is implemented by a single molding of plastic is inexpensive. When the holder 26 is not used with the housing 24, projections and recesses which would impair the appearance are absent on the housing 24. The surface of the housing 24 may be finished by contraction to make the channels 38 and 40 on the bottom and back of the housing 24 unnoticeable. The channel 40 on the back would successfully function even with relatively small dimensions. The channel 38 on the bottom is not objectionable because the bottom is hardly visible.

In summary, it will be seen that the present invention provides a housing and holder assembly or a portable communication apparatus which has desirable portability and attractive design with no regard to an optional holder and allows the holder to be attached and detached as desired without the fear of scratches and serious damage.

Although the invention has been described, by way of example, with reference to particular embodiments, it will be appreciated that variations and modifications thereof, as well as other embodiments, may be made within the scope of the appended claims.

Claims

1. A housing and holder assembly (20) for a portable communications apparatus (22) including a housing (24) accommodating the communications apparatus (22), and a holder (26) mounted on the housing (24), the holder (26) being removably mounted on the housing (24), characterised in that there is provided a battery cover (32) forming a part of the housing (24) and slidable relative to the housing (24), in that the holder (26) when mounted on the housing (24) engages the housing (24) in at least two places, such that at one of the at least two places the holder (26) contacts both the housing (24) and the battery cover (32) simultaneously, and in that locking means (34a,50)(38,52) associated respectively with one of the at least two places is provided for, when the holder (26) is mounted on the housing (24), locking the holder (26) in position, the battery cover (32) being removable from the housing (24) while the holder (26) is held in engagement with the housing (24), and the removal of the battery cover (32) facilitating the detachment of the holder (26) from the housing (24).

2. A housing and holder assembly (20) as claimed in claim 1, wherein the housing (24) includes a top on which an operating section (34) of the apparatus (22) is provided, a bottom where the battery cover (32) is positioned, and a back on which the holder (26) is removably mounted.

3. A housing and holder assembly (20) as claimed in claim 2, wherein the locking means includes a channel (38) extending throughout a part of the bottom of the housing (24) and a part of the battery cover (32), and a projection (52) provided on that part of the holder which corresponds to the bottom of the housing (24) and engageable with the channel (38).

4. A housing and holder assembly (20) as claimed in claim 3, wherein the top of the housing (24) is shaped with a recess which defines the operating section (34) of the apparatus (22).

5. A housing and holder assembly (20) as claimed in claim 4, wherein the locking means includes a shoulder (34a) which forms a wall of the recess, and a projection (50) protruding from that part of the holder (26) which corresponds to the top of the housing (24) and which is engageable with the shoulder (34a).

6. A housing and holder assembly (20) as claimed in claim 2, characterised in that it includes positioning means (40, 54) for positioning the holder (26) on the back of the housing (24).

7. A housing and holder assembly (20) as claimed in claim 6, wherein the positioning means (40, 54) includes a channel (40) provided on the back of the housing (24), and a lug (54) extending from that part of the holder (26) which corresponds to the back of the housing (24) and engageable with the channel (40).

Patentansprüche

1. Gehäuse- und Halterungsanordnung (20) für einen tragbaren Kommunikationsapparat (22) mit einem Gehäuse (24) zur Aufnahme des Kommunikationsapparats (22) und einer an dem Gehäuse (24) angeordneten Halterung (26), wobei die Halterung (26) abnehmbar an dem Gehäuse (24) angeordnet ist, dadurch gekennzeichnet, daß eine Batterieabdeckung (32) vorgesehen ist, die einen Teil des Gehäuses (24) bildet und relativ zu dem Gehäuse



When the holder 26 is put on the waist belt 48 or the like, it is hardly visible from the outside because it is mounted only on the substantially intermediate portion of the back of the pager 22, i.e., the pager 22 does not seem bulky at all despite the presence of the holder 26. The holder 26 which is implemented by a single molding of plastic is inexpensive. When the holder 26 is not used with the housing 24, projections and recesses which would impair the appearance are absent on the housing 24. The surface of the housing 24 may be finished by contraction to make the channels 38 and 40 on the bottom and back of the housing 24 unnoticeable. The channel 40 on the back would successfully function even with relatively small dimensions. The channel 38 on the bottom is not objectionable because the bottom is hardly visible.

In summary, it will be seen that the present invention provides a housing and holder assembly or a portable communication apparatus which has desirable portability and attractive design with no regard to an optional holder and allows the holder to be attached and detached as desired without the fear of scratches and serious damage.

Although the invention has been described, by way of example, with reference to particular embodiments, it will be appreciated that variations and modifications thereof, as well as other embodiments, may be made within the scope of the appended claims.

Claims

1. A housing and holder assembly (20) for a portable communications apparatus (22) including a housing (24) accommodating the communications apparatus (22), and a holder (26) mounted on the housing (24), the holder (26) being removably mounted on the housing (24), characterised in that there is provided a battery cover (32) forming a part of the housing (24) and slidable relative to the housing (24), in that the holder (26) when mounted on the housing (24) engages the housing (24) in at least two places, such that at one of the at least two places the holder (26) contacts both the housing (24) and the battery cover (32) simultaneously, and in that locking means (34a,50)(38,52) associated respectively with one of the at least two places is provided for, when the holder (26) is mounted on the housing (24), locking the holder (26) in position, the battery cover (32) being removable from the housing (24) while the holder (26) is held in engagement with the housing (24), and the removal of the battery cover (32) facilitating the detachment of the holder (26) from the housing (24).

2. A housing and holder assembly (20) as claimed in claim 1, wherein the housing (24) includes a top on which an operating section (34) of the apparatus (22) is provided, a bottom where the battery cover (32) is positioned, and a back on which the holder (26) is removably mounted.
3. A housing and holder assembly (20) as claimed in claim 2, wherein the locking means includes a channel (38) extending throughout a part of the bottom of the housing (24) and a part of the battery cover (32), and a projection (52) provided on that part of the holder which corresponds to the bottom of the housing (24) and engageable with the channel (38).
4. A housing and holder assembly (20) as claimed in claim 3, wherein the top of the housing (24) is shaped with a recess which defines the operating section (34) of the apparatus (22).
5. A housing and holder assembly (20) as claimed in claim 4, wherein the locking means includes a shoulder (34a) which forms a wall of the recess, and a projection (50) protruding from that part of the holder (26) which corresponds to the top of the housing (24) and which is engageable with the shoulder (34a).
6. A housing and holder assembly (20) as claimed in claim 2, characterised in that it includes positioning means (40, 54) for positioning the holder (26) on the back of the housing (24).
7. A housing and holder assembly (20) as claimed in claim 6, wherein the positioning means (40, 54) includes a channel (40) provided on the back of the housing (24), and a lug (54) extending from that part of the holder (26) which corresponds to the back of the housing (24) and engageable with the channel (40).

Patentansprüche

1. Gehäuse- und Halterungsanordnung (20) für einen tragbaren Kommunikationsapparat (22) mit einem Gehäuse (24) zur Aufnahme des Kommunikationsapparats (22) und einer an dem Gehäuse (24) angeordneten Halterung (26), wobei die Halterung (26) abnehmbar an dem Gehäuse (24) angeordnet ist, dadurch gekennzeichnet, daß eine Batterieabdeckung (32) vorgesehen ist, die einen Teil des Gehäuses (24) bildet und relativ zu dem Gehäuse



(24) verschiebbar ist, daß die Halterung (26), wenn diese an dem Gehäuse (24) angeordnet ist, mit dem Gehäuse (24) an mindestens zwei Stellen in Eingriff steht, so daß an einer der mindestens zwei Stellen die Halterung (26) sowohl das Gehäuse (24) als auch die Batterieabdeckung (32) gleichzeitig berührt, und daß eine Verriegelungseinrichtung (34a, 50) (38, 52) vorgesehen ist, die jeweils zu einem der mindestens zwei Stellen gehört, zum Verriegeln der Halterung (26) in Position, wenn die Halterung (26) an dem Gehäuse (24) angeordnet ist, wobei die Batterieabdeckung (32) von dem Gehäuse (24) abnehmbar ist, während die Halterung (26) mit dem Gehäuse (24) in Eingriff gehalten wird, und wobei das Entfernen der Batterieabdeckung (32) das Lösen der Halterung (26) von dem Gehäuse (24) erleichtert.

2. Gehäuse- und Halterungsanordnung (20) nach Anspruch 1, wobei das Gehäuse (24) eine Oberseite, an der ein Bedienabschnitt (34) des Apparats (22) vorgesehen ist, eine Bodenseite, wo die Batterieabdeckung (32) angeordnet ist, und eine Rückseite umfaßt, an der die Halterung (26) abnehmbar angeordnet ist.

3. Gehäuse- und Halterungsanordnung (20) nach Anspruch 2, wobei die Verriegelungseinrichtung einen Kanal (38), der sich über einen Teil der Bodenseite des Gehäuses (24) und einen Teil der Batterieabdeckung (32) erstreckt, und einen Vorsprung (52) aufweist, der an dem Teil der Halterung vorgesehen ist, der der Bodenseite des Gehäuses (24) entspricht und mit dem Kanal (38) in Eingriff bringbar ist.

4. Gehäuse- und Halterungsanordnung (20) nach Anspruch 3, wobei die Oberseite des Gehäuses (24) mit einer Ausnehmung ausgebildet ist, die den Bedienabschnitt (34) des Apparats (22) definiert.

5. Gehäuse- und Halterungsanordnung (20) nach Anspruch 4, wobei die Verriegelungseinrichtung eine Schulter (34a), die eine Wand der Ausnehmung bildet, und einen Vorsprung (50) aufweist, der von dem Teil der Halterung (26) absteht, der der Oberseite des Gehäuses (24) entspricht und der mit der Schulter (34a) in Eingriff bringbar ist.

6. Gehäuse- und Halterungsanordnung (20) nach Anspruch 2, dadurch gekennzeichnet, daß diese eine Positioniereinrichtung (40, 54) aufweist zum Positionieren der Halterung (26) an der Rückseite des Gehäuses (24).

7. Gehäuse- und Halterungsanordnung (20) nach Anspruch 6, wobei die Positioniereinrichtung (40, 54) einen an der Rückseite des Gehäuses (24) vorgesehenen Kanal (40) und einen Ansatz (54) aufweist, der sich von dem Teil der Halterung (26) erstreckt, der der Rückseite des Gehäuses (24) entspricht und mit dem Kanal (40) in Eingriff bringbar ist.

Revendications

1. Ensemble de boîtier et de support (20) pour un appareil de communication portable (22) comportant un boîtier (24) recevant l'appareil de communication (22) et un support (26) monté sur le boîtier (24), le support (26) étant monté de manière amovible sur le boîtier (24), caractérisé en ce qu'il est prévu un couvercle de batterie (32) formant une partie du boîtier (24) et pouvant coulisser par rapport au boîtier (24), en ce que le support (26) lorsque monté sur le boîtier (24) s'enclenche dans le boîtier (24) dans au moins deux positions, de sorte qu'en une des aux moins deux positions, le support (26) soit en contact à la fois avec le boîtier (24) et le couvercle de batterie (32) simultanément, et en ce qu'un moyen de blocage (34 a, 50) (38, 52) associé respectivement à une des aux moins deux positions est prévu pour, lorsque le support (26) est monté sur le boîtier (24), bloquer le support (26) en position, le couvercle de batterie (32) étant enlevable du boîtier (24) tandis que le support (26) est maintenu en prise avec le boîtier (24), et l'enlèvement du couvercle de batterie (32) facilitant le détachement du support (26) du boîtier (24).

2. Ensemble de boîtier et de support (20) selon la revendication 1, dans lequel le boîtier (24) comporte une partie supérieure sur laquelle une section opérateur (34) de l'appareil (22) est prévue, une partie inférieure où le couvercle de batterie (32) est positionné, et une partie de dos sur laquelle le support (26) est monté de manière amovible.

3. Ensemble de boîtier et de support (20) selon la revendication 2, dans lequel le moyen de blocage comporte un canal (38) s'étendant à travers une partie du fond du boîtier (24) et une partie du couvercle de batterie (32), et une saillie (52) prévue sur la partie du support qui correspond au fond du boîtier (24) et qui s'enclenche dans le canal (38).

4. Ensemble de boîtier et de support (20) selon la revendication 3, dans lequel la partie supérieure du boîtier (24) est formée avec un évide-

ment qui définit la section opérateur (34) de l'appareil (22).

5. Ensemble de boîtier et de support (20) selon la revendication 4, dans lequel le moyen de blocage comporte un épaulement (34a) qui forme une paroi de l'évidement, et une saillie (50) dépassant à partir de la partie du support (26) qui correspond à la partie supérieure du boîtier (24) qui est enclenchable dans l'épaulement (34a). 5 10
6. Ensemble de boîtier et de support (20) selon la revendication 2, caractérisé en ce qu'il comporte un moyen de positionnement (40, 54) pour positionner le support (26) sur le dos du boîtier (24). 15
7. Ensemble de boîtier et de support (20) selon la revendication 6, dans lequel le moyen de positionnement (40, 54) comporte un canal (50) prévu sur le dos du boîtier (24), et d'une oreille (54) se prolongeant à partir de la partie du support (26) qui correspond au dos du boîtier (24) et enclenchable dans le canal (40). 20 25



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