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(19)

(54) DETACHABLE MOUNTING CLIP ARRANGEMENT FOR MINIATURE PORTABLE APPARATUS OR THE LIKE

(71) We, MOTOROLA, INC., a corporation organised and existing under the laws of the State of Delaware, United States of America, of Corporate Offices, Motorola Center, 1303 East Algonquin Road, Schaumburg, Illinois 60196, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:

This invention relates to a detachable mounting clip arrangement especially suited for use with personalized radio receivers which may be readily and conveniently detached therefrom as desired.

Personalized radio apparatus and other devices of this sort are intended to be worn on the belt or carried in a shirt pocket of the user. This requires a mounting clip arrangement of some sort whereby the portable apparatus can be securely attached to the belt or shirt pocket so as to avoid damage by inadvertent dropping of the apparatus.

However, in some instances, the clip arrangement actually used is of a substantial bulk when compared to the radio housing itself and can cause a number of undesirable problems. For example, in servicing or maintenance operations, the clip assembly can become snagged in test leads of monitoring equipment or in other materials in close proximity. Then too, it creates a problem for battery charging equipment in that the entrance opening thereto is of a more complicated configuration than the otherwise rather simple rectangular opening if no clip assembly were included or protruding on the radio apparatus. In any event, with the size of the miniaturized or personal radio apparatus decreasing substantially in recent years, the size of the mounting clip becomes more and more prominent and, in many instances, less desirable.

Accordingly, it is an object of the present invention to provide detachable mounting clip arrangement of the foregoing type which may simply and conveniently insert within a retainer lock ring and latch therein, but which may be removed by a simple tool when desired.

According to the invention there is provided a detachable mounting clip arrangement especially suited for use with a portable, apparatus to be worn on the person and detachable therefrom for hand-held use, including a housing, an undercut raised ridge on said housing having at least two mutually convergent portions, said housing further having a plurality of serrations displaced from said portions, a base plate dimensioned to insert between said portions of said raised ridge and having resilient finger releasably engaging a selected one of said housing serrations to lock said base plate in engagement with said housing, an elongate mounting clip and means for pivotably securing said mounting clip to said base plate.

In an embodiment of the invention, a detachable mounting clip arrangement is provided for releasable attachment to an associated miniaturized radio receiver or other portable apparatus and the like which includes projecting but convergent undercut side walls designed to accept a tapered base plate for retention therein and wherein a laterally extending resilient finger interfits with a serrated section on the apparatus housing to latch the base plate securely to the apparatus housing. The base plate includes means for supporting a conventional pivoted clip assembly which may be attached to the base plate by a pin and which may further support a torsion spring thereon. The clip assembly itself can be removed or otherwise detached from the housing by a simple tool prying up the resilient finger so as to release the tapered base plate from the recess with undercut side walls.

The invention will now be described by

way of example only with particular reference to the accompanying drawings, in which:

Figure 1 is a view in perspective of a typical personalized radio receiver apparatus which includes a mounting clip arrangement of the present invention;

Figure 2 is an exploded view of the mounting clip arrangement as shown in Figure 1 illustrating the component parts thereof;

Figure 3 is an enlarged, fragmentary view in cross-section of the raised ridge essentially along lines 4-4 as depicted in Figure 2; and

Figure 4 is an enlarged, fragmentary view of a cross-section of the radio housing showing a serrated section thereon for engagement by the resilient finger of the base plate as shown in Figure 2.

A radio apparatus 10 is illustrated in Figure 1 of the miniaturized or personal type intended to be carried by a user of his belt or in a shirt pocket. It is to be understood that the invention may be made applicable to a wide variety of miniaturized or other portable apparatus. In any event, a mounting clip arrangement indicated generally at 20 is shown attached to the housing 12 of the radio apparatus 10, which clip arrangement has been constructed in accordance with the present invention.

As best seen in Figure 2, the mounting clip arrangement 20 includes a base plate 22 and a conventional mounting clip 24 for attachment to base plate 22 by a connecting pin 26. A torsion spring 28 is mounted on and supported by the pin 26 to provide the required spring bias for clip 24.

As illustrated, an upraised ledge or ridge 30 is provided on the housing 12 of apparatus 10 which is essentially open at one end thereof and is of a generally inverted U-shaped configuration. This ridge is formed by two convergent undercut side walls 30*a* and joined by a similar wall 30*b* at the narrower dimension or top, viewing Figure 2, thereof. This provides a tapered recess or opening (see Figure 3) within which to insert the base plate 22, itself having a similar or corresponding tapered configuration. The housing 12 further includes a series of serrations 32 on the housing body, the purpose of which will be described subsequently.

The base plate 22 includes the tapered body as previously mentioned of substantially the same dimension provided by side walls 30*a* so as to insert within and be retained by the retaining ridge 30 of housing 12. The base plate 22 further includes a centrally located finger or member 22*a* located in substantially the same plane as plate 22 and a pair of upstanding projections 22*b* extending perpendicular to the plane of the base plate. Each of the projections 22*b* includes an opening 22*c* of substantially the same circular dimension as the pin 26 so as to receive the same therein by force fit. The base plate 22 further includes a beveled edge 22*d* along three sides thereof of substantially the same configuration as the angle of the undercut side walls 30*a* and 30*b* of the retaining ridge 30 on housing 12 (see Figure 3).

In assembly, mounting clip 24 is attached to base plate 22 by aligning the openings 22*c* of the projection 22*b* on base plate 22 with the corresponding openings 24*c* in the projections or tab members 24*b* on clip 24 and the insertion therethrough of the locking pin 26 on which the torsion spring 28 is mounted. The entire assembly, i.e., interconnected base plate and clip, is inserted into the retainer ridge 30. The beveled edge portions 22*d* of base plate 22 operatively engage the inner, undercut surface of the leg portions 30*a* and 30*b* of ridge 30 (best seen in Figure 3). Upon base plate 22 being fully inserted into engagement within retainer ring 30, the finger portion 22*a* engages an appropriate one of the serrations 32 on housing 12 to thereby lock the assembly of base plate 22 and interconnected clip to the housing 12 of apparatus 10. As more clearly seen in Figure 4, the finger member 22*a* includes a sharp beveled trailing edge 22*e* which engages one of the serrations 32 on the housing 12. The finger member 22*a* is prebent to a given configuration so as to conform to the inclination of the surface of the serrations 32. In any event, engagement by member 22*a* of the appropriate serration 32 locks the entire assembly within the retainer ridge 30 and the housing and the clip assembly are firmly attached to one another.

To detach the clip assembly 20, a simple blade tool or the like may be used to pry the resilient finger member 22*a* upwardly out of engagement with the associated serration 32 and the entire assembly may be withdrawn from the retainer ridge 30. No other tools are required or fasteners removed. Disassembly may be effected conveniently and quickly when desired. Reassembly may be as easy effected and even less time and effort.

WHAT WE CLAIM IS:

1. A detachable mounting clip arrangement especially suited for use with a portable apparatus to be worn on the person, and detachable therefrom for hand-held use, including a housing, an undercut, raised ridge onward housing having at least two mutually convergent portions, said housing further having a plurality of serrations displaced from said portions, a base plate dimensioned to insert between said portions of said raised ridge and having a resilient finger releasably engaging a selected one of said housing serrations to lock said base plate in engagement with said housing, an elongate mounting clip and means for pivotably securing said mounting clip to said base plate.

2. A detachable mounting clip arrange-

ment as claimed in claim 1 wherein said raised ridge forms a three sided, tapered recess open at one end thereof and wherein said base plate includes a corresponding tapered configuration with said resilient finger being prebent and having a tapered trailing edge.

3. A detachable mounting clip arrangement as claimed in claim 1 wherein the means for pivotably securing the mounting clip to the base plate includes a pair of upstanding projections on said base plate with a central opening therein and a corresponding pair of projections on said mounting clip having similar openings therein and a pin insertable in said openings of said projections on said base plate and mounting clip.

4. A detachable mounting clip arrangement as claimed in claim 3 wherein a torsion spring is mounted on said pin to provide a set spring bias for said mounting clip.

5. A detachable mounting clip arrangement substantially as hereinbefore described ans as shown in the accompanying drawing.

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1 SHEET
This drawing is a reproduction of the Original on a reduced scale

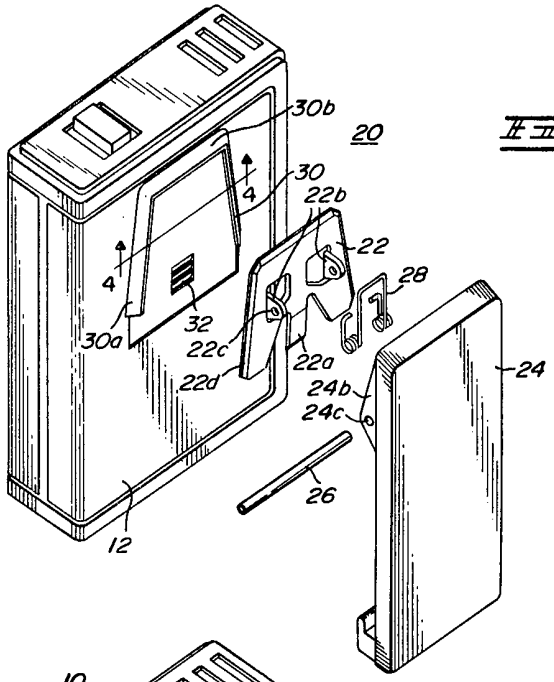

Fig. 2

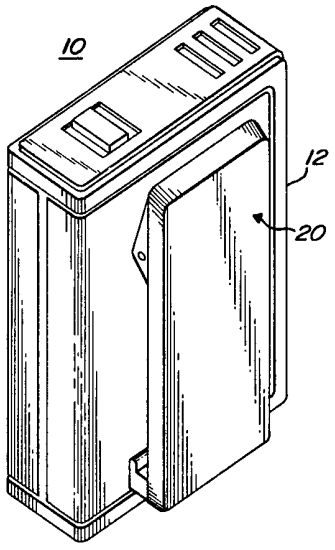

Fig. 1

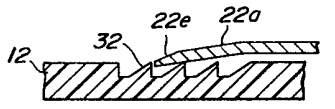

Fig. 4

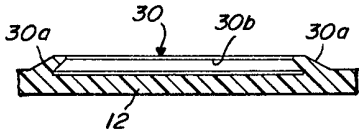

Fig. 3