

HANDS-FREE TELEPHONE

The present invention relates to a telephone that can be used in hands-free mode. The present invention also relates to a casing which is adapted to receive a telephone handset
5 and which enables the handset to be used in hands-free mode. Herein "hands free" means that the telephone is adapted to be used without use of the hands to hold the telephone next to the head of a user.

There are currently a number of accessories available which enable telephones to be used
10 in a hands-free mode. One accessory for mobile phones consists of a wire with an earpiece (speaker) and microphone. The wire plugs into the phone and the earpiece is inserted into the ear during use. The microphone is positioned along the wire such that it will be in proximity to the user's mouth during phone use. A common problem with this type of accessory is that the wire often becomes entangled or knotted. It can also be tedious to
15 have to attach the accessory to the phone as and when needed. Being separate from the phone, there is also the possibility that the accessory can be misplaced or lost.

More recently, wireless technology has been used to provide hands-free capability for mobile phones. However, this type of accessory is relatively expensive and requires its
20 own power source which must be recharged from time to time. This type of accessory can also be tedious to use, especially if the phone must be configured to communicate with the accessory prior to each use. As with the wire accessory described above, being non-integral to the phone, this type of accessory is also prone to being misplaced or lost.

25 The present invention seeks to overcome these problems by providing a telephone having an integral mechanism which enables the phone to be used in hands-free mode. Being integral to the phone the mechanism is always to hand when needed. The mechanism is relatively cheap, simple in construction and does not involve any electrical or electronic components. The invention also provides a casing which includes the same mechanism
30 and which is adapted to receive a telephone handset. This casing allows handsets which do not include the mechanism to be operated in hands-free mode.

Accordingly, in one aspect the present invention provides a telephone which is capable of being used in a hands-free mode, wherein the telephone comprises:

5 a telephone handset; and

a hands-free lever which is attached to the telephone handset and which is moveable between a first position in which the hands-free lever is stored adjacent the handset and a second position in which the hands-free lever is capable of being positioned behind or
10 around an ear of a user such that the telephone handset can be suspended from the ear thereby allowing the telephone handset to be used in hands-free mode.

Central to the present invention is the use of a hands-free lever provided as an integral component of a telephone handset to allow the handset to be suspended from a user's ear
15 and suitably positioned relative to the user's head so that the telephone may be used in hands-free mode.

In accordance with the present invention the hands-free lever is moveable between first and second positions. The first position corresponds to when the hands-free lever is not in
20 use. In this position the lever is stored adjacent the (body of the) telephone handset in a compact arrangement. This prevents the lever interfering with normal (non-hands-free) operation of the telephone handset. In a preferred embodiment the handset includes a recess which is adapted to receive the hands-free lever when it is required to be stored in the first position. This gives the telephone a more slimline appearance and prevents the
25 hands-free lever snagging against clothing, and the like, when the lever is not in use. The recess may be configured, or include a retaining clip or the like, to ensure that the hands-free lever remains in the stored (first) position when not in use. The recess typically takes the form of an elongate channel having an internal configuration which corresponds to the external configuration of the hands-free lever it is intended to receive. The body of the
30 telephone handset is usually made of plastic and the recess may be formed by suitable moulding of the plastic.

Usually, in the first position, the hands-free lever will be stored adjacent the back of the telephone handset. By the term "back" is meant the side of the handset remote from the keypad. When the handset includes a recess for the hands-free lever, the recess is therefore
5 usually provided at the back of the telephone handset. Other arrangements are of course possible within the context of the invention, but this one is more preferred.

In the second position the hands-free lever is oriented so that it may be positioned behind or around an ear of a user. In use the telephone handset will be suspended from the ear by
10 the hands-free lever. Obviously, the hands-free lever must allow the telephone handset to be suspended such that the handset speaker will be in suitable proximity to the user's ear and such that the handset microphone will be in suitable proximity to the user's mouth. With this in mind the exact configuration of the hands-free lever will vary depending upon the design of the telephone handset being used. It is however straightforward to arrive at a
15 suitable design for the hands-free lever for any given telephone handset.

The hands-free lever is intended to be positioned behind or around an ear of a user of the telephone of the invention. Thus, the hands-free lever may take the form of an elongate member attached at both ends to the handset, thereby forming a loop in the second
20 position. In this embodiment, the hands-free lever would be suitable for being positioned around the ear. In this embodiment the elongate member may have structural rigidity, but this is not essential since it is attached at both ends to the handset.

Alternatively, the hands-free lever may take the form of an elongate member which is
25 attached at only one end to the handset. Here the elongate member is usually L-shaped or arcuate elongate member enabling it to be positioned behind the ear, in much the same way as the arms of spectacles. In this embodiment the elongate member must have sufficient structural rigidity to enable the telephone handset to be suspended as necessary since the hands-free lever is attached to the handset at one end only.

The material from which the hands-free lever is made will depend to a large extent on the structural rigidity required of it. In part this will depend upon the configuration of the hands-free lever and in part on the weight of the telephone handset being used. Preferably, the hands-free lever is formed of a material which offers suitable mechanical properties (rigidity), which is lightweight and which is inexpensive. Suitable materials include metals, such as aluminium and plastics. A variety of engineering plastics may be used such as polyethylene, polypropylene, PVC, polystyrene and nylon. Composite materials may also be used, such as fibre-reinforced plastics, but cost considerations may mean that these are less preferred than cheaper and equally suitable materials.

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The hands-free lever may be manufactured by known techniques depending upon the material chosen. The hands-free lever is usually formed as a separate component and subsequently attached to the handset by suitable attachment means. For wear comfort, the hands-free lever should not include any sharp edges in the region of the lever that will come into contact with a user's skin. The hands-free lever may also be padded to make it more comfortable to use.

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The hands-free lever is attached to the handset and is moveable between first and second positions. The means of attachment may take a variety of forms provided the hands-free lever is secured to the handset and may be moved between first and second positions relative thereto. For instance the hands-free lever may be attached by way of a pivot about which the lever may be rotated between first and second positions. In this embodiment the handset may include a shaft (or pin) extending from a side thereof to which the hands-free lever is rotatably attached. Here the hands-free lever may be adapted to be clipped on to the shaft. Thus, the end of the hands-free lever to be attached to the shaft may be essentially C-shaped in cross section. This cross-section allows the end of the lever to be clipped on to the shaft and, to facilitate this, it is preferable that the material forming the C-section is resiliently deformable. In this case the shaft usually also includes a flange at its end to prevent the hands-free lever sliding off.

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As an alternative means of attachment the handset may be provided with a hole (or well) which is adapted to engage an end of the hands-free lever. To facilitate this the end of the hands-free lever may be provided with an enlarged distal head having a diameter slightly larger than that of the hole. In this case the hands-free lever may be attached to the handset
5 by forcing the enlarged distal head through the hole, the hole and/or head being resiliently deformed so that the hole closes around the head thereby securing the hands-free lever to the handset.

The telephone may include two hands-free levers attached to the handset and moveable
10 between first and second positions such that the telephone may be suspended from either ear, depending upon user preference. It is preferred however that the handset includes two attachment means for the hands-free lever and a single, detachable hands-free lever. This allows the lever to be attached to either attachment means thereby allowing the telephone to be suspended from either ear depending upon the location of the attachment means to
15 which the hands-free lever is attached. In this embodiment the attachment means are provided on opposing surfaces (preferably opposing edges) of the handset.

In use a call is made or received using the telephone handset and the handset then suspended from the ear of a user to hold a conversation on the telephone without having to
20 hold the telephone by hand.

In another embodiment the present invention provides a casing which enables a telephone handset to be used in hands-free mode, the casing comprising:

25 a sleeve portion which is adapted to receive a telephone handset; and

a hands-free lever which is attached to the sleeve portion and which is moveable between a first position in which the hands-free lever is stored adjacent the sleeve portion and a second position in which the hands-free lever is capable of being positioned behind or
30 around an ear of a user such that a telephone handset provided in the sleeve portion can be

suspended from the ear thereby allowing the telephone handset to be used in hands-free mode.

5 This embodiment allows the concept underlying the present invention to be applied to a conventional telephone handset, thereby enabling the handset to be used in hands-free mode. It will be appreciated that the foregoing description is applicable to this embodiment, the sleeve portion of the casing corresponding to the handset with respect to how the hands-free lever is attached etc.

10 The sleeve portion of the casing is configured to receive a telephone handset. Usually the sleeve portion slidably receives the handset. Obviously, the sleeve portion must not interfere with operation of the handset with regard to the keypad thereof and the speaker and microphone components. Typically, the casing will take the form of a thin shell into which the handset may be inserted. The casing is usually made of a lightweight material
15 having suitable structural rigidity. Engineering plastics as described above are generally used.

The telephone handset referred to above may be a mobile or cordless telephone handset. Preferably, the telephone handset is a mobile telephone handset. Irrespective of type, the
20 handset must not be excessively heavy otherwise it will be unsuitable for practical use in accordance with the present invention. Typically, the maximum weight of the telephone handset is 100g. Preferably, the handset weighs between 70 and 80g. These are the weights of the handset itself and they do not include the weight of the hands-free levers and/or casing.

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Embodiments of the present invention are illustrated in the accompanying non-limiting drawings in which:

Figure 1 is a rear view of a telephone in accordance with the present invention;

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Figure 2 represents a side view of the telephone shown in Figure 1;

Figure 3 is a rear view illustrating in more detail attachment means and corresponding hands-free lever in accordance with an embodiment of the invention; and

- 5 Figure 4 is a rear view illustrating in more detail attachment means and corresponding hands-free lever in accordance with the present invention.

The drawings are schematic and are not to scale. They are intended to illustrate the concept underlying the present invention only.

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Figures 1 and 2 illustrate the same telephone (1) in accordance with the present invention in rear and side views respectively. The telephone (1) includes a telephone handset (2) and a hands-free lever (3). The solid line for the hands-free lever (3) shows the lever in a first (stored) position adjacent the rear surface of the telephone handset (2). In the stored
15 position the lever (3) sits in a recess (4) which takes the form of an elongate channel provided in the rear surface of the telephone handset (2). The hands-free lever (3) is attached to the telephone handset (2) by attachment means (5) about which the lever (3) can rotate between first and second positions. The broken line (6) represents the position of the hands-free lever (3) when the telephone (1) is to be used in hands-free mode.

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Figure 3 illustrates attachment means for the hands-free lever in more detail. Thus, the telephone handset (2) comprises two shafts (7) extending from opposing edges of the handset (2). The shafts (7) each include a flange (8) provided at their end. To facilitate attachment to the shaft (7) the hands-free lever (3) includes a C-section (9) which is
25 suitably sized to allow it to be clipped over the shaft (7) thereby attaching the hands-free lever (3) to the telephone handset (2). The hands-free lever (3) is detachable by means of the C-section (9) thereby allowing the hands-free lever (3) to be clipped on to either shaft (7). This allows the telephone handset (2) to be set up for use on either ear of a user, depending upon user preference. It is of course possible that the telephone handset (2)
30 includes one shaft (7) only.

Figure 4 illustrates an alternative attachment means of the hands-free lever. Thus, the telephone handset (2) includes a hole/well (10) provided at its outer surface. The hole/well (10) has a larger internal diameter than the diameter of the hole/well (10) as it appears at the outer surface of the telephone handset (2). The end of the hands-free lever (3) to be
5 attached to the telephone handset (2) includes an enlarged distal head (11) which is larger in diameter than the diameter of the hole/well (10) as it appears at the outer surface of the telephone handset (2). The diameter of the enlarged distal head (11) is however slightly smaller than the internal diameter of the hole/well (10). The hands-free lever (3) is attached to the telephone handset (2) by forcing the enlarged distal head (11) into the
10 hole/well (10) where it will be held in place. The surrounding outer edges of the hole/well (10) and/or the enlarged distal head (11) may be resiliently deformable to facilitate this. The hole/well (10) and the enlarged distal head (11) must be suitably sized and shaped to allow the hands-free lever (3) to rotate between first and second positions, as necessary during use of the telephone (1) in hands-free mode.

CLAIMS:

1. A telephone which is capable of being used in a hands-free mode, wherein the telephone comprises:
5 a telephone handset; and

a hands-free lever which is attached to the telephone handset and which is moveable between a first position in which the hands-free lever is stored adjacent the handset and a second position in which the hands-free lever is capable of being positioned
10 behind or around an ear of a user such that the telephone handset can be suspended from the ear thereby allowing the telephone to be used in hands-free mode.
2. A telephone according to claim 1, wherein the handset includes a recess which is
15 adapted to receive the hands-free lever when it is required to be stored in the first position.
3. A telephone according to claim 2, wherein the recess takes the form of an elongate
20 channel.
4. A telephone according to claim 1, wherein the hands-free lever is attached to the telephone handset by a pivot about which the hands-free lever may be rotated between first and second positions.
- 25 5. A telephone according to claim 1, wherein the hands-free lever is an L-shaped elongate member or an arcuate elongate member and one end of the hands-free lever is attached to the telephone handset.
6. A telephone according to claim 1, which includes two hands-free levers attached to
30 the handset and moveable between first and second position such that the telephone may be suspended from either ear when the telephone is used in hands-free mode.

7. A telephone according to claim 1, wherein the telephone handset includes two attachment means for the hands-free lever and wherein the hands-free lever is releasably attachable to either attachment means such that the telephone may be suspended from either ear when the telephone is used in hands-free mode.
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8. A casing which enables a telephone handset to be used in hands-free mode, the casing comprising:
10 a sleeve portion which is adapted to receive a telephone handset; and
a hands-free lever which is attached to the sleeve portion and which is moveable between a first position in which the hands-free lever is stored adjacent the sleeve portion and a second position in which the hands-free lever is capable of being
15 positioned behind or around an ear of a user such that a telephone handset provided in the sleeve portion can be suspended from the ear thereby allowing the telephone handset to be used in hands-free mode.
9. A casing according to claim 8, wherein the sleeve portion includes a recess which is adapted to receive the hands-free lever when it is required to be stored in the first position.
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10. A casing according to claim 9, wherein the recess takes the form of an elongate channel.
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11. A casing according to claim 8, wherein the hands-free lever is attached to the sleeve portion by a pivot.
12. A casing according to claim 8, wherein the hands-free lever is an L-shaped elongate member or an arcuate elongate member and one end of the hands-free lever is
30 attached to the sleeve portion.

13. A casing according to claim 8, which includes two hands-free levers attached to the sleeve portion and moveable between first and second position such that the telephone may be suspended from either ear when the telephone is used in hands-free mode.
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14. A casing according to claim 8, wherein the sleeve portion includes two attachment means for the hands-free lever and wherein the hands-free lever is releasably attachable to either attachment means such that the telephone may be suspended
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- form either ear when the telephone handset is used in hands-free mode.