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A STYLUS AND HOUSING ASSEMBLY ASSOCIATED WITH A TOUCH SCREEN

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FIELD OF THE INVENTION

This invention relates a stylus and housing assembly associated with a touch screen.

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BACKGROUND ART

Personal organisers and portable communication devices sometimes use a touch screen to allow a user to input data or access functions. In order to achieve higher resolution than can be obtained by use of a finger, some personal organisers and portable communication devices have an associated stylus for activating the touch screen. For convenience, the stylus can be typically stored in an aperture in a housing of the personal organiser or portable communication device. Furthermore, as today's trend is towards smaller devices the stylus must also be reduced in size in order to be stored in the housing. However, the stylus may not be able to be practically stored in housings of small portable communication devices and the like as the stylus must be of a useable and ergonomic size which is typically that of small pen.

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SUMMARY OF THE INVENTION

It is an aim of this invention to overcome or alleviate at least one of the problems associated with a stylus for use with touch screens or at least provide the public with a useful alternative.

According to one aspect of the invention there is provided a stylus and housing assembly associated with a touch screen, said assembly comprising:

5 a telescopic stylus having a pointer member coupled to a handle member to allow relative movement therebetween; and

an electronic device housing with a touch screen display, said housing having an engagement member for releasable engaging said telescopic stylus to allow mounting thereof to said housing,

10 wherein when engaging said telescopic stylus said engagement member engages at least a portion of said pointer member to retract said stylus during mounting thereof to said housing and extension of said stylus during removal thereof from said housing.

Preferably, said engagement member may comprise a slot or channel associated with said housing.

In a suitable alternative form said engagement member may suitably comprise an entrance in said housing, said entrance being in communication with a stylus receiving chamber.

Preferably, said chamber may have one or more protrusions therein for frictionally engaging said portion of said pointer member.

25 Suitably, said pointer member may have one or more recesses for complementary engaging said protrusions.

Preferably, said chamber may have internal surfaces that include at least one shoulder portion.

Suitably, there may be a gripping surface adjacent said shoulder portion to provide for frictionally engaging said portion of said pointer member. The said gripping surface may provide an interference fit with said portion of said pointer member.

35 Preferably, at least a portion of said gripping surface may be formed from a resilient material.

Preferably, the stylus may include a chamber within which a piston is located and allowed to reciprocally slide to thereby allow said relative movement between said handle member and pointer member.

5 Suitably, said entrance may be shaped to expose a portion of said handle member when said stylus is in a retracted position and completely engages said engagement member.

Preferably, said entrance may have an elongate slot.

10 Suitably, said slot may taper outwardly away from said chamber.

Suitably, when engaging said telescopic stylus said portion of said handle member that is exposed may have slots therein.

15 Suitably, said slots may be normal to a longitudinal axis of said telescopic stylus.

BRIEF DESCRIPTION OF THE DRAWINGS

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In order that the invention may be readily understood and put into practical affect, reference will now be made to preferred embodiments illustrated in the accompanying drawings in which:

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Fig. 1 is a cross sectional side view of a preferred embodiment of a retracted telescopic stylus in accordance with this invention;

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Fig. 2 is a cross sectional side view of a preferred embodiment of an extended telescopic stylus of Fig. 1;

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Fig. 3 is a perspective view of the telescopic stylus of Fig. 1;

FIG. 4 is perspective view of an inside part of a housing for a communication device;

5 Fig. 5 is a perspective view of a pad for mounting to the inside part of the housing of FIG. 4;

10 Fig. 6 is a perspective view illustrating a stylus and housing assembly in which the stylus of Fig. 1 is being inserted into an engagement member of the housing of FIG. 4;

15 Fig. 7 is a perspective view illustrating the assembly of Fig. 6 when the stylus of Fig. 1 is completely inserted into the engagement member of the housing of FIG. 4;

20 Fig. 8 is a perspective view of a reverse side of the stylus and housing assembly of Fig 6; and

Fig. 9 is a perspective view of a second preferred embodiment of pad for mounting to the inside part of the housing of FIG. 4.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

30 Referring to the Figs. in which like components are designated by identical numerals, reference is first directed to Figs. 1 to 3 which illustrates a telescopic stylus 1 having a metal pointer member 2 coupled to a handle member 3 so that pointer member 2 can move relative to handle member 3. In this regard, pointer member 2
35 comprises an integral body 4 with annular recesses 4a and a shaft 5 with a piston 7 adjacent a free end of the shaft

5. The piston 7 has two spaced machined annular recesses within which are mounted respective "O" rings 6. A free end of body 4 is tapered and has an aperture 8 within which is mounted a shaft 9 of a stylus tip 10 made of a plastics material.

The handle member 3 is basically an injection moulded plastics cylinder housing with a chamber 11 within which piston 7 is allowed to reciprocally slide. At one end of the chamber 11 there are a vent holes 12 for pressure equalisation in the chamber 11 and adjacent the opposite end there is a semicircular retaining ring 13. During manufacture, the piston 7 is inserted into chamber 11 after which the retaining ring 13 is ultrasonically welded to the handle member 3 which retains piston 7 inside chamber 11 as will be apparent to a person skilled in the art. Another feature of the handle member 3 is that it has a raised tapered portion 14 with slots 15 that are normal to a longitudinal axis L of the stylus 1.

In Fig. 4 there is illustrated an inside part of a housing 16 for a communication device. The housing 16 has an entrance 17, mounting pins 18, support walls 19 and a boss 20 with an aperture 22 forming part of the entrance 17. The entrance 17 also includes an elongate tapered slot 21. The slot 21 and aperture 22 are aligned with a recessed track 23 in the housing 16.

In Fig. 5 there is illustrated a pad 25 for mounting to the inside part of the housing 16. The pad 25 is made from a resilient material, typically rubber, and comprises a recess 26 for complementary engaging outer walls of boss 20. The pad also has four blind apertures 27 located to engage with mounting pins 18 and there are two elongate recesses 28 for engaging with walls 19 of housing 16. The pad 25 also has a recessed track 29 and associated shoulder portions 30 with adjacent gripping surfaces 31. The pad 25 is mounted to housing 16 by use of an adhesive as will be apparent to a person skilled in the art. In

this regard, pins 18 engage with respective apertures 27, boss 20 engages recess 26 and walls 19 engage respective recesses 28. Hence, when the pad 25 is mounted to housing 16 a chamber is formed by tracks 23 and 29, this chamber
 5 being in communication and alignment with the entrance 17 and the shoulder portions 30 extend into the chamber.

Referring to Figs. 6 to 8, there is illustrated a stylus and housing assembly 40 associated with a touch screen 41. The assembly 40 comprises the stylus 1,
 10 housing 16 (typically for a portable communication device) and pad 25 (not shown). When the stylus 1 is mounted to the housing 16 by insertion into the chamber through entrance 17 the pointer member 2 and gripping surfaces 31 interact to cause an interference fit. Accordingly, the
 15 gripping surfaces 31 frictionally engage the pointer member 2 providing resistance as the stylus 1 is inserted which therefore causes the telescopic stylus 1 to retract. When the stylus 1 is retracted, the raised tapered portion 14 is located in the tapered slot 21. To remove the
 20 stylus 1 a user may simply push against the raised tapered portion 14 in a direction away from the chamber as shown by arrow A. The gripping surface 31 will provide some resistance thereby the stylus 1 will automatically extend during removal as will be apparent to a person skilled in
 25 the art. The stylus 1 is then ready for use to activate menus, input data and access functions that are displayed on the touch screen 41.

In Fig 9 there is illustrated a second preferred embodiment of a pad 55 for mounting to the inside part of
 30 the housing 16. The pad 55 is made from a resilient material and comprises a recess 56 for complementary engaging outer walls of boss 20. The pad 55 also has four blind apertures 57 located to engage with mounting pins 18 and there are two elongate recesses 58 for engaging with
 35 walls 19 of housing 16. The pad 55 also has a recessed track 59 and an associated protrusions 60 for

complementary engaging the recesses 4a of the pointer member 2.

5 The pad 55 is mounted to housing 16 by use of an adhesive as will be apparent to a person skilled in the art. In this regard, pins 18 engage with respective apertures 57, boss 20 engages recess 56 and walls 19 engage respective recesses 58. Hence, when the pad 25 is mounted to housing 16 a chamber is formed by tracks 23 and 59, this chamber being in communication and alignment with
10 the entrance 17 and the protrusions 60 extend into the chamber.

In use, the protrusions 60 engage the recesses 4a of the pointer member 2 providing resistance as the stylus 1 is inserted which therefore causes the telescopic stylus 1
15 to retract. When the stylus 1 is retracted, the raised tapered portion 14 is located in the tapered slot 21. Again, to remove the stylus 1 a user may simply push against the raised tapered portion 14 in a direction away from the chamber and the protrusions engaging the recesses
20 4a will provide some resistance thereby the stylus 1 will automatically extend during removal as will be apparent to a person skilled in the art.

Advantageously, the present invention allows for the stylus 1 to be automatically retracted and extended when
25 respectively inserted into or removed from the chamber. As a result, the stylus 1 is readily extended and retracted by a user gripping the handle member 3 with one hand whilst the other hand is holding the housing 16. Accordingly, the present invention allows for the stylus 1
30 to be of a usable and ergonomic size when extended as well as being able to be stored in housings of small communication devices.

Although the invention has been described with reference to preferred embodiments it is to be
35 understood that the invention is not restricted to the embodiments described herein.



WE CLAIM:

1. A stylus and housing assembly associated with a touch screen, said assembly comprising:

5 a telescopic stylus having a pointer member coupled to a handle member to allow relative movement therebetween; and

an electronic device housing with a touch screen display, said housing having an engagement member for
10 releasable engaging said telescopic stylus to allow mounting thereof to said housing,

wherein when engaging said telescopic stylus said engagement member engages at least a portion of said pointer member to retract said stylus during mounting
15 thereof to said housing and extension of said stylus during removal thereof from said housing.

2. A stylus and housing assembly as claimed in claim 1, wherein said engagement member comprises a slot
20 or channel associated with said housing.

3. A stylus and housing assembly as claimed in claim 1, wherein said engagement member comprises an entrance in said housing, said entrance being in
25 communication with a stylus receiving chamber.

4. A stylus and housing assembly as claimed in claim 3, wherein said chamber has one or more protrusions therein for frictionally engaging said portion of said
30 pointer member.

5. A stylus and housing assembly as claimed in claim 4, wherein said pointer member has one or more recesses for complementary engaging said protrusions.



6. A stylus and housing assembly as claimed in claim 3, wherein said chamber has internal surfaces that include at least one shoulder portion.
- 5 7. A stylus and housing assembly as claimed in claim 6, wherein there is a gripping surface adjacent said shoulder portion to provide for frictionally engaging said portion of said pointer member.
- 10 8. A stylus and housing assembly as claimed in claim 7, wherein said gripping surface provides an interference fit with said portion of said pointer member.
- 15 9. A stylus and housing assembly as claimed in claim 8, wherein at least a portion of said gripping surface is formed from a resilient material.
- 20 10. A stylus and housing assembly as claimed in claim 1, wherein the stylus includes a chamber within which a piston is located and allowed to reciprocally slide to thereby allow said relative movement between said handle member and pointer member.
- 25 11. A stylus and housing assembly as claimed in claim 3, wherein said entrance is shaped to expose a portion of said handle member when said stylus is in a retracted position and completely engages said engagement member.
- 30 12. A stylus and housing assembly as claimed in claim 11, wherein said entrance has an elongate slot.
- 35 13. A stylus and housing assembly as claimed in claim 12, wherein, said slot tapers outwardly away from said chamber.



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REPLACED

14. A stylus and housing assembly as claimed in claim 11, wherein when engaging said telescopic stylus said portion of said handle member that is exposed has slots therein.

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15. A stylus and housing assembly as claimed in claim 14, wherein said slots are normal to a longitudinal axis of said telescopic stylus.

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16. A stylus and housing assembly as substantially described herein with reference to and as illustrated by the accompanying drawings.

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