CLAIMS

~~What is claimed is:~~

1. An injector comprising:

a housing having an injection end;

an injection needle enclosed within the housing, the injection needle penetrating skin at a selected injection site and dispensing a drug product when an injection cycle of the injector is activated; ~~and~~

a flexible extension disposed at the injection end of the housing for stretching or pinching the skin of the injection site; and

an adaptor for attaching to the housing of the injector, the flexible extension removably attached to the adaptor.

~~2. The injector according to claim 1, wherein the flexible extension is integral with the housing.~~

~~3. The injector according to claim 1, wherein the flexible extension is removably attached to the housing.~~

2~~4~~. An injector comprising:

a housing having an injection end;

an injection needle enclosed within the housing, the injection needle penetrating skin at a selected injection site and dispensing a drug product when an injection cycle of the injector is activated;

a flexible extension disposed at the injection end of the housing for stretching or pinching the skin of the injection site~~The injector according to claim 3~~, wherein the flexible extension is removably attached to the housing;~~further comprising~~ and

a locking arrangement for removably attaching the flexible extension to the housing, the locking arrangement including interlocking first and second members, the flexible extension including one of the first and second members and the housing including the other one of the first and second members.

3~~5~~. An injector comprising:

a housing having an injection end;

an injection needle enclosed within the housing, the injection needle penetrating skin at a selected injection site and dispensing a drug product when an injection cycle of the injector is activated; and

a flexible extension disposed at the injection end of the housing for stretching or pinching the skin of the injection site,

wherein the flexible extension is removably attached to the housing, ~~The injector according to claim 3,~~ wherein the flexible extension is selected from a kit of flexible extensions, wherein one of the flexible extensions of the kit is constructed to stretch the skin of the injection site and wherein another one of the flexible extensions of the kit is constructed to pinch the skin of the injection site.

~~6. The injector according to claim 1, wherein the flexible extension is non-removably attached to the housing of the injector.~~

~~7. The injector according to claim 1, further comprising an adaptor for attaching to a housing of the injector, the flexible extension removably attached to the adaptor.~~

4~~8~~. The injector according to claim ~~7~~1, further comprising a locking arrangement for removably attaching the flexible extension to the adaptor, the locking arrangement including interlocking first and second members, the flexible extension including one of the first and second members and the adaptor including the other one of the first and second members.

5~~9~~. The injector according to claim 1, further comprising a needle shield for covering the injection needle upon withdrawal of the injection needle from the skin of the injection site.

6~~10~~. The injector according to claim 5~~9~~, wherein the flexible extension is integral with the needle shield.

7~~11~~. The injector according to claim 5~~9~~, wherein the flexible extension is removably attached to the needle shield.

8~~12~~. An injector comprising:

a housing having an injection end;

an injection needle enclosed within the housing, the injection needle penetrating skin at a selected injection site and dispensing a drug product when an injection cycle of the injector is activated;

a flexible extension disposed at the injection end of the housing for stretching or pinching the skin of the injection site; and

a needle shield for covering the injection needle upon withdrawal of the injection needle from the skin of the injection site,

wherein the flexible extension is removably attached to the needle shield~~The injector according to claim 11~~, wherein the flexible extension is selected from a kit of flexible extensions, wherein one of the flexible extensions of the kit is constructed to stretch the skin of the injection site and wherein another one of the flexible extensions of the kit is constructed to pinch the skin of the injection site.

~~13~~9. The injector according to claim ~~9~~5, wherein the flexible extension is non-removably attached to the needle shield.

~~14~~10. The injector according to claim ~~9~~5, wherein a bottom portion of the needle shield extends out from the injection end of the housing and wherein the needle shield is capable of arming the

injector if a user presses the injection end of the housing down against the skin at the injection site.

~~15~~11. The injector according to claim ~~9~~5, wherein the needle shield is colored for indicating completion of the injection cycle.

~~16~~12. The injector according to claim ~~9~~5, wherein the needle shield has a rounded edge for contacting the skin at the injection site.

~~17~~13. The injector according to claim 1, wherein the flexible extension has one or more ring-shaped protrusions or ridges formed in or on a working surface of the extension.

~~18~~14. The injector according to claim 1, wherein the flexible extension has a plurality of nubs formed in or on a working surface of the extension.

~~19~~15. The injector according to claim 1, wherein the flexible extension has a grippy or textured working surface.

~~20~~16. The injector according to claim 1, wherein the flexible extension is constructed as a flange.

~~21~~17. The injector according to claim 1, wherein the flexible extension is made of a polyurethane or silicon-polyurethane copolymer material.

~~22~~18. The injector according to claim 1, further comprising a palm button device for at least activating the injection cycle of the injector.

~~23~~19. The injector according to claim ~~22~~18, wherein the palm button device has a mushroom-shaped palm button.

~~24~~20. The injector according to claim ~~22~~18, wherein the palm button device has a handle-shaped palm button.

~~25~~21. The injector according to claim ~~22~~18, wherein the palm button device comprises a palm button having at least one indent for placement of a user's thumb.

~~26~~22. The injector according to claim 18~~22~~, wherein the palm button device comprises a palm button having a polyurethane gel elastomer coating.

~~27~~23. The injector according to claim 18~~22~~, wherein the palm button device is integral with the injector.

~~28~~24. The injector according to claim 18~~22~~, wherein the palm button device is removably attached to the housing of the injector.

~~29~~25. The injector according to claim 18~~22~~, wherein the palm button device is non-removably attached to the housing of the injector.

~~30~~26. The injector according to claim 18~~22~~, wherein the palm button device comprises a palm button and a mounting arrangement for operatively coupling the palm button to the injector.

~~31~~27. The injector according to claim ~~30~~26, wherein the mounting arrangement comprises a base extending from the palm button and an adaptor for attaching to a housing of the injector, the base movably coupled to the adaptor.

~~32~~28. The injector according to claim ~~22~~18, wherein the operation of the palm button device arms the injector.

~~33~~29. The injector according to claim 1, further comprising a holding device for aiding a user in the operation of the injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand; and

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector.

~~34~~30. The injector according to claim ~~33~~29, wherein the sleeve of the holding device has a polyurethane gel elastomer layer that defines a hand grip.

~~35~~31. The injector according to claim 29~~33~~, wherein the sleeve has a top wall operative as stop for properly positioning the sleeve on the injector so that a user can operate the injector with one hand.

~~36~~32. The injector according to claim 31~~35~~, wherein the top wall includes an opening for allowing an activation button of the injection extend through the top wall.

3337. An injector comprising:

a housing having an injection end;

an injection needle enclosed within the housing, the injection needle penetrating skin at a selected injection site and dispensing a drug product when an injection cycle of the injector is activated;

a flexible extension disposed at the injection end of the housing for stretching or pinching the skin of the injection site; and

a holding device for aiding a user in the operation of the injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand; and

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector~~The injector according to claim 33~~, wherein the at least one hand rest is pivotally coupled to the sleeve.

~~38~~34. The injector according to claim ~~37~~33, wherein the at least one hand rest includes a projection that engages a side wall of the housing if the at least one hand rest is in a clamping position, thereby removably attaching the holding device to the injector.

~~39~~35. The injector according to claim ~~38~~34, further comprising a detent arrangement for retaining the at least one hand rest in the clamping position.

~~40~~36. An injector comprising:

a housing having an injection end;

an injection needle enclosed within the housing, the injection needle penetrating skin at a selected injection site and dispensing a drug product when an injection cycle of the injector is activated;

a flexible extension disposed at the injection end of the housing for stretching or pinching the skin of the injection site; and

a holding device for aiding a user in the operation of the injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand; and

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector~~The injector according to claim 33~~, wherein the at least one hand rest is contoured to receive the hypothenar muscle area of the user's hand.

~~41~~37. The injector according to claim ~~33~~29, wherein the holding device is integral with the injector.

~~42~~38. The injector according to claim ~~33~~29, wherein the holding device is removably attached to the housing of the injector.

~~43~~39. An injector comprising:

a housing having an injection end;

an injection needle enclosed within the housing, the injection needle penetrating skin at a selected injection site and dispensing a drug product when an injection cycle of the injector is activated;

a flexible extension disposed at the injection end of the housing for stretching or pinching the skin of the injection site; and

a holding device for aiding a user in the operation of the injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand; and

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector~~The injector according to claim 33~~,

wherein the holding device includes a locking arrangement for non-removably attaching the holding device to the housing of the injector.

~~44~~40. The injector according to claim ~~33~~29, wherein the holding device allows a user to arm and initiate the injection cycle of the injector.

~~45~~41. The injector according to claim ~~33~~29, wherein the holding device allows a user to initiate the injection cycle of the injector.

~~46~~42. The injector according to claim ~~45~~41, wherein the sleeve is capable of being slidably moved on the housing of the injector to initiate the injection cycle of the injector.

~~47. An injector comprising:~~

~~a housing having an activation end and an injection end disposed opposite to and inline with the activation end; and~~

~~a palm button device disposed at the activation end of the housing, the palm button for at least activating an injection cycle of the injector.~~

~~48. The injector according to claim 47, wherein the palm button device has a mushroom-shaped palm button.~~

~~49. The injector according to claim 47, wherein the palm button device has a handle-shaped palm button.~~

~~50. The injector according to claim 47, wherein the palm button device comprises a palm button having at least one indent for placement of a user's thumb.~~

~~51. The injector according to claim 47, wherein the palm button device comprises a palm button having a polyurethane gel elastomer coating.~~

~~52. The injector according to claim 47, wherein the palm button device is integral with the injector.~~

~~53. The injector according to claim 47, wherein the palm button device is removably attached to the housing of the injector.~~

~~54. The injector according to claim 47, wherein the palm button device is non-removably attached to the housing of the injector.~~

~~55. The injector according to claim 47, wherein the palm button device comprises a palm button and a mounting arrangement for operatively coupling the palm button to the injector.~~

~~56. The injector according to claim 55, wherein the mounting arrangement comprises a base extending from the palm button and an adaptor for attaching to a housing of the injector, the base movably coupled to the adaptor.~~

~~57. The injector according to claim 47, wherein the operation of the palm button device arms the injector.~~

~~58~~43. An injector comprising:

a housing; and

a holding device for aiding a user in the operation of the injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand; and

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector, wherein the at least one hand rest is contoured to receive the hypothenar muscle area of the user's hand.

~~59~~44. The injector according to claim ~~58~~43, wherein the sleeve of the holding device has a polyurethane gel elastomer layer that defines a hand grip.

~~60~~45. The injector according to claim ~~58~~43, wherein the sleeve has a top wall operative as stop for properly positioning the sleeve on the injector so that a user can operate the injector with one hand.

~~61~~46. The injector according to claim ~~60~~45, wherein the top wall includes an opening for allowing an activation button of the injection extend through the top wall.

~~62~~47. An injector comprising:

a housing; and

a holding device for aiding a user in the operation of the injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand; and

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector~~The injector according to claim 58~~, wherein the at least one hand rest is pivotally coupled to the sleeve.

~~63~~48. The injector according to claim ~~62~~47, wherein the at least one hand rest includes a projection that engages a side wall of the housing if the at least one hand rest is in a clamping position, thereby removably attaching the holding device to the injector.

~~64~~49. The injector according to claim ~~63~~48, further comprising a detent arrangement for retaining the at least one hand rest in the clamping position.

~~65. The injector according to claim 58, wherein the at least one hand rest is contoured to receive the hypothenar muscle area of the user's hand.~~

~~66~~50. The injector according to claim ~~58~~43, wherein the holding device is integral with the injector.

~~67~~51. The injector according to claim ~~58~~43, wherein the holding device is removably attached to the housing of the injector.

~~68~~52. An injector comprising:

a housing; and

a holding device for aiding a user in the operation of the injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand; and

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector~~The injector according to claim 58~~,

wherein the holding device includes a locking arrangement for non-removably attaching the holding device to the housing of the injector.

~~69~~53. The injector according to claim ~~58~~43, wherein the holding device allows a user to arm and initiate the injection cycle of the injector.

~~70~~54. The injector according to claim ~~58~~43, wherein the holding device allows a user to initiate the injection cycle of the injector.

~~71~~55. The injector according to claim ~~58~~43, wherein the sleeve is capable of being slidably moved on the housing of the injector to initiate the injection cycle of the injector.

~~72~~56. A device for use with an injector having an injection needle, the device comprising:

a flexible extension for attaching to an injection end of the injector, the flexible extension for stretching or pinching skin at the selected injection site, wherein the flexible extension is configured to be removably attached to the injector; and

an adaptor for attaching to a housing of the injector, the flexible extension removably attached to the adaptor.

~~73~~57. The device according to claim ~~72~~56, wherein the flexible extension has one or more ring-shaped protrusions or ridges formed in or on a working surface thereof.

~~74~~58. The device according to claim ~~72~~56, wherein the flexible flange has a plurality of nubs formed in or on a working surface thereof.

~~75~~59. The device according to claim ~~72~~56, wherein the flexible flange has a grippy or textured working surface.

~~76. The device according to claim 72, wherein the flexible flange is configured to be removably attached to the injector.~~

~~77. The device according to claim 76, further comprising an adaptor for attaching to a housing of the injector, the flexible extension removably attached to the adaptor.~~

~~78~~60. The device according to claim ~~77~~ 56, further comprising a locking arrangement for removably attaching the flexible extension to the adaptor, the locking arrangement including interlocking first and second members, the flexible extension including one of the first and second members and the adaptor including the other one of the first and second members.

~~79~~61. A holding device for aiding a user in the operation of an injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand; and

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector, wherein the at least one hand rest is contoured to receive the hypothenar muscle area of the user's hand.

~~80~~62. The holding device according to claim ~~79~~61, wherein the sleeve of the holding device has a polyurethane gel elastomer layer that defines a hand grip.

~~81~~63. The holding device according to claim ~~79~~61, wherein the sleeve has a top wall operative as stop for properly positioning the sleeve on the injector so that a user can operate the injector with one hand.

~~82~~64. The holding device according to claim ~~81~~63, wherein the top wall includes an opening for allowing an activation button of the injector to extend through the top wall.

~~83~~65. A holding device for aiding a user in the operation of an injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand; and

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector~~The holding device according to claim 79~~, wherein the at least one hand rest is pivotally coupled to the sleeve.

~~84~~66. The holding device according to claim ~~83~~65, wherein the at least one hand rest includes a projection for engaging a side wall of the housing if the at least one hand rest is in a clamping position, thereby allowing removable attachment of the holding device to the injector.

~~85~~67. The holding device according to claim ~~84~~66, further comprising a detent arrangement for retaining the at least one hand rest in the clamping position.

~~86. The holding device according to claim 79, wherein the at least one hand rest is contoured to receive the hypothenar muscle area of the user's hand.~~

~~87~~68. A holding device for aiding a user in the operation of an injector, the holding device comprising:

a sleeve for ergonomically holding and operating the injector with one hand;

at least one hand rest extending out from the sleeve for maintaining a user's hand on the sleeve when holding and operating the injector; and~~The holding device according to claim 79, further comprising~~

a locking arrangement for non-removably attaching the holding device to the housing of the injector.

~~88~~69. The holding device according to claim ~~79~~61, wherein the holding device allows a user to initiate the injection cycle of the injector.

~~89~~70. The holding device according to claim ~~79~~61, wherein the sleeve is capable of being slidably moved on the housing of the injector to initiate the injection cycle of the injector.

~~90. A palm button device for at least activating an injection cycle of an injector, the device comprising:~~

~~a palm button; and~~

~~a mounting arrangement for operatively coupling the palm button to the injector.~~

~~91. The device according to claim 90, wherein the mounting arrangement comprises:~~

~~a base extending from the palm button; and~~

~~an adaptor for attaching to a housing of the injector, the base movably coupled to the adaptor.~~

~~92. The device according to claim 90, wherein the palm button has a mushroom-shape.~~

~~93. The device according to claim 90, wherein the palm button has a handle-shape.~~

~~94. The device according to claim 90, wherein the palm button has at least one indent for placement of a user's thumb.~~

~~95. The device according to claim 90, wherein the palm button comprises a polyurethane gel elastomer coating.~~

~~96. The device according to claim 91, wherein the adaptor is non-removably attaches to the housing of the injector.~~

~~97~~71. The injector of claim 1 or claim 43~~claims 1, 47, or 58~~, further comprising a container or syringe disposed in the housing, the container or syringe containing a therapeutic product.