

Claims

1. A needle shield assembly comprising:
an elongate needle shield comprising a shield portion, a hub connection portion and a bridge portion including a living hinge having a thickness, the bridge portion joining the hub connection portion and the shield portion, the hub connection portion comprising a receiving ring having a diameter sized to frictionally receive the hub outer surface when the needle assembly is inserted through the receiving ring and a flange extending from the receiving ring defining a top planar surface and a bottom surface, the hub being rotatable within the receiving ring, the cylindrical wall extension having an inner surface with splines that are configured to cooperate with hub splines on a needle hub when a needle hub is engaged with the cylindrical wall extension, wherein the hub splines and the splines are configured to create a tactile or perceptible click during each rotation as the hub splines and the splines engage and disengage each other as the hub is rotated with respect to the shield portion, the shield portion having two side walls defining a longitudinal opening and a back wall between the side walls defining a recess having an interior surface, the shield portion configured to pivot from an open position in which a needle cannula is exposed, to a closed needle protecting position in which the distal end of the needle cannula is within the longitudinal opening of the shield.
2. The needle shield assembly of claim 1, the receiving ring further comprising a cylindrical wall extension which extends below the bottom surface of the flange to provide a cylindrical receiving structure.
3. The needle shield assembly of claim 2, further comprising a plurality of ribs extending from the bottom surface and radially extending from the cylindrical wall extension.
4. The needle shield assembly of claim 3, wherein the plurality of ribs comprises from 3 to 8 ribs.
5. The needle shield assembly of claim 4, wherein the plurality of ribs comprises from 3 to 5 ribs.
6. The needle shield assembly of claim 1, the bridge portion comprising a first span spaced apart from a second span to provide a gap between the first span and the second span, and the living hinge having a first portion joining the first span to the shield portion and a second portion joining the second span to the shield portion.

7. The needle shield assembly of claim 6, the first span and the second span each comprise a width and the gap comprises a width such that the width of the gap is greater than the width of the first span and the width of the second span.

8. The needle shield assembly of claim 7, further comprising a leg comprising a bend connecting the shield portion and the flange.

9. The needle shield assembly of claim 1, the living hinge having a thickness in a range of from 0.1 mm to 0.3 mm and the flange having a thickness in a range of from 0.4 mm to 0.8 mm.

10. The needle shield assembly of claim 1, the shield portion further comprising a locking member including two locking projections facing each other and projecting from the side walls and configured to engage with a needle cover placed over the needle cannula when the shield in the closed position to a locking tab extending from the flange.

11. The needle shield assembly of claim 1, the shield portion, the bridge portion, the hub connection portion and the living hinge comprising a unitary structure integrally molded of thermoplastic material.

12. A needle shield and needle assembly comprising:

a needle assembly including a needle cannula having a proximal end, a distal end and a lumen therethrough, and a hub having an outer surface, a plurality of radial projections and a plurality of hub splines extending radially from the hub, an open proximal end spaced from the radial projections and the hub splines including a cavity therein and a distal end attached to the proximal end of the needle cannula so that the lumen is in fluid communication with the cavity; and

an elongate needle shield comprising a shield portion, a hub connection portion and a bridge portion including a living hinge having a thickness, the bridge portion joining the hub connection portion and the shield portion, the hub connection portion comprising a receiving ring having a diameter sized to frictionally receive the hub outer surface when the needle assembly is inserted through the receiving ring and a flange extending from the receiving ring defining a top planar surface and a bottom surface, the hub being rotatable within the receiving ring, the flange having a thickness, the thickness of the flange divided by the thickness of the living hinge defining a ratio of from 1.1 to 6, the shield portion having two side walls defining a longitudinal opening and a back wall between the side walls defining a recess having an interior surface, the shield portion configured to pivot from an open position in which the needle cannula is exposed, to a closed needle-protecting position in which the distal end of the needle cannula is within the longitudinal opening of the shield.

13. The needle shield and needle assembly of claim 12, the receiving ring further comprising a cylindrical wall extension which extends below the bottom surface of the flange to provide a cylindrical receiving structure.

14. The needle shield and needle assembly of claim 13, further comprising a plurality of ribs extending from the bottom surface and radially extending from the cylindrical wall extension.

15. The needle shield and needle assembly of claim 14, wherein the plurality of ribs comprises from 3 to 8 ribs.

16. The needle shield and needle assembly of claim 14, wherein the plurality of ribs comprises from 3 to 5 ribs.

17. The needle shield and needle assembly of claim 12, the bridge portion comprising a first span spaced apart from a second span to provide a gap between the first span and the second span, and the living hinge having a first portion joining the first span to the shield portion and a second portion joining the second span to the shield portion.

18. The needle shield and needle assembly of claim 17, the first span and the second span each comprise a width and the gap comprises a width such that the width of the gap is greater than the width of the first span and the width of the second span.

19. The needle shield and needle assembly of claim 18, further comprising a leg comprising a bend connecting the shield portion and the flange.

20. The needle shield and needle assembly of claim 12, the living hinge having a thickness in a range of from 0.1 mm to 0.3 mm and the flange having a thickness in a range of from 0.4 mm to 0.8 mm.

21. The needle shield and needle assembly of claim 12, the shield portion further comprising a locking member including two locking projections facing each other and projecting from the side walls and configured to engage with a needle cover placed over the needle cannula when the shield is in the closed position to a locking tab extending from the flange.

22. The needle shield and needle assembly of claim 12, the shield portion, the bridge portion, the hub connection portion and the living hinge comprising a unitary structure integrally molded of thermoplastic material.

23. The needle shield and needle assembly of claim 12, the projections spaced from proximal end so that the hub remains seated in the receiving ring.

24. The needle shield and needle assembly of claim 12, the proximal end of the hub comprising lugs that are configured to be engaged with a threaded collar of a syringe so that the needle shield and needle assembly connectable to the syringe.

25. The needle shield and needle assembly of claim 12, a cylindrical wall extension having an inner surface with splines that are configured to cooperate with hub splines on a needle hub when a needle hub is engaged with the cylindrical wall extension.

26. The needle shield and needle assembly of claim 25, wherein the splines are hollow sections on the inner surface, and the hub splines are elongate radial protrusions that are complementary to and configured to seat within the splines.

27. The needle shield and needle assembly of claim 26, wherein the hub splines and the splines are configured to cooperate to allow rotation of the hub with respect to the shield portion.

28. The needle shield and needle assembly of claim 26, wherein the hub splines and the splines are configured to create a tactile or perceptible click during each rotation as the hub splines and the splines engage and disengage each other as the hub is rotated with respect to the shield portion.