CLAIMS

1. A method of producing a microparticle, the method comprising:

providing a mould assembly, which comprises two moulds that comprise a first mould and a second mould,

positioning the mould assembly in an open position, wherein the first and second moulds are separated from each other,

providing a pliable moulding material inside the mould assembly in the open position,

applying heat to the pliable moulding material to soften the pliable moulding material,

positioning the mould assembly in a closed position to define a micro-cavity,

pressing the first mould and the second mould against each other to cause the first and second moulds to compress the softened pliable moulding material within the micro-cavity to take up the shape of the micro-cavity to form the softened pliable moulding material into a microparticle with a size of between about 1 and about 1000 micron, and

positioning the mould assembly in the open position after the microparticle is moulded, wherein the microparticle adheres to one of the two moulds of the mould assembly,

wherein one of the first and second moulds is dimensioned such that it sticks to the moulded microparticle and wherein the other of the first and second moulds is dimensioned such that it does not hold or stick to the moulded microparticle.

2. The method according to claim 1, further comprising cooling the pliable moulding material to solidify the pliable moulding material.

3. The method according to claim 1 or 2, further comprising removing the microparticle from the mould assembly using a vacuum device.

4. The method according to any one of the above-mentioned claims, wherein the first and second moulds are milled or cut moulds that are milled or cut from a block of material.

5. The method according to any one of the above-mentioned claims, wherein the first mould comprises an inner surface including a mould-body surface and several mould-spike surfaces with several partial mould-spike surfaces and/or wherein the second mould comprises an inner surface including a mould-body surface and several mould-spike surfaces with several partial mould-spike surfaces.

6. The method according to any one of the above-mentioned claims, wherein
the first mould comprises a stationary mould and the second mould comprises a moveable mould; or
the first mould comprises a moveable mould and the second mould comprises a stationary mould.

7. The method according to claim 6, wherein the stationary mould is attachable to a fixed supporting surface.

8. A microparticle produced with a method according to claim 5 or any one of claims 6 and 7 when dependent on claim 5, the microparticle comprising

a body; and

a plurality of spikes, the spikes extending from an outer surface of the body,

each spike comprising

a rod portion including a partial cone body; and

an end portion having a shape of a partial sphere,

wherein

a first end of the partial cone body comprises a top end surface with a circular edge, wherein the top end surface is integrally attached to the end portion,

a second end of the partial cone body comprises a base end surface with a circular edge, wherein the base end surface is integrally attached to the outer surface of the body,

the base end surface is larger than the top end surface,

a cross-section of the partial cone body of the rod portion has a shape of a trapezium,

the microparticle is formed by compression moulding of a pliable moulding material, and

the microparticle has a size of between about 1 and about 1000 micron.

9. The microparticle according to claim 8, wherein the body has a shape of a sphere and the diameter of the sphere is about 0.3 millimetre (mm), the length of the spike is about 0.1 mm, and the general diameter of the spike is about 0.03 mm.

10. The microparticle according to claim 8 or 9, wherein the spikes have the same or different lengths.

11. The microparticle according to claim 10, wherein at least one spike has a length that is long enough for transdermal delivery of a therapeutic or a transdermal

delivery of a therapeutic or a cosmetic agent to a region inside or below a skin while being sufficiently short for avoiding contacting nerves in the skin to reduce the chances of bleeding and pain

12. The microparticle according to any one of claims 8 to 11, wherein
the body and the spikes are produced from a substance that includes a therapeutic or a cosmetic agent,
the body and spikes are coated with a therapeutic or a cosmetic agent, or
the body encapsulates a therapeutic or a cosmetic agent.

13. The microparticle according to any one of claims 8 to 12, wherein
an axis of the rod portion extends about perpendicularly to the outer surface of the body.

14. The microparticle according to one of the claims 8 to 13, wherein
the spikes are distributed evenly across the outer surface.

15. A device for producing a microparticle, the device comprising
a first mould; and
a second mould,
wherein
the device is configured to apply heat to the pliable moulding material to soften the pliable moulding material, and
the first mould and the second mould are adapted such that,

in a closed position, the first mould and the second mould define a micro-cavity, and the first mould and the second mould are configured to press against each other to compress a softened pliable moulding material within the micro-cavity to cause the softened pliable moulding material to take up the shape of the micro-cavity to form the softened pliable moulding material into the microparticle, and

in an open position, one of the first mould and the second mould adheres to the microparticle while the other separates from the microparticle,

wherein one of the first and second moulds is dimensioned such that it sticks to the moulded microparticle and wherein the other of the first and second moulds is dimensioned such that it does not hold or stick to the moulded microparticle.

16. The device according to claim 15, wherein each of the first mould and the second mould is a milled or cut mould.

17. The device of claim 15 or 16, wherein the first mould comprises an inner surface including a mould-body surface and several mould-spike surfaces with several partial mould-spike surfaces and/or wherein the second mould comprises an inner surface including a mould-body surface and several mould-spike surfaces with several partial mould-spike surfaces.

18. The device according to claim 17, wherein a shape of the mould-body surface of the first mould and a shape of the mould-body surface of the second mould correspond to the shape of the microparticle.

19. The device according to any one of claims 15 to 18, wherein
the first mould comprises a stationary mould and the second mould comprises a moveable mould; or
the first mould comprises a moveable mould and the second mould comprises a stationary mould.

20. The device according to claim 19, wherein the stationary mould is attachable to a fixed supporting surface.