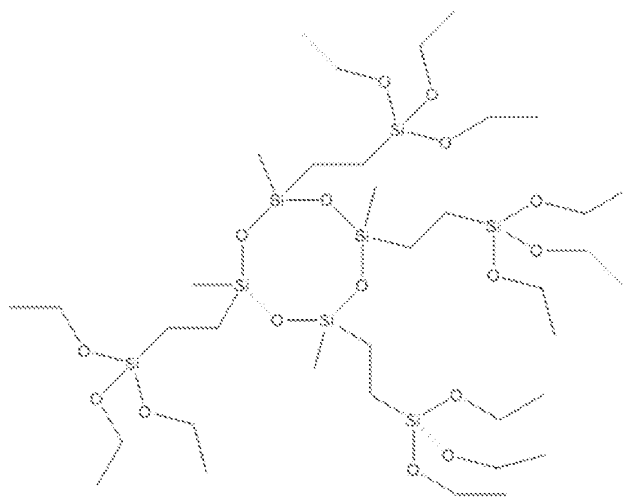


What is claimed is:

1. An imprinting apparatus, comprising:
 - a silicon master including a plurality of features positioned at an average pitch of less than about 425 nm, each of the plurality of features comprising a depression having an opening with its largest opening dimension being less than about 300 nm; and
 - an anti-stick layer coating a surface of the silicon master, the anti-stick layer including a crosslinked silane polymer network.
2. The imprinting apparatus as defined in claim 1, wherein less than about 0.15% of a total number of the plurality of features has a membrane defect.
3. The imprinting apparatus as defined in claim 1, wherein the anti-stick layer is generated with a formulation including:
 - a first silane monomer:



; and

- less than about 1.4 wt%, based on a total amount of silanes present in the formulation, of a second silane monomer including a hydrolyzable chloride group.
4. The imprinting apparatus as defined in claim 1, wherein the anti-stick layer coats a wall of each of the depressions without capping the opening or without fully filling the depression.

5. The imprinting apparatus as defined in claim 1, wherein the largest opening dimension of each of the plurality of features ranges from about 170 nm to about 290 nm.

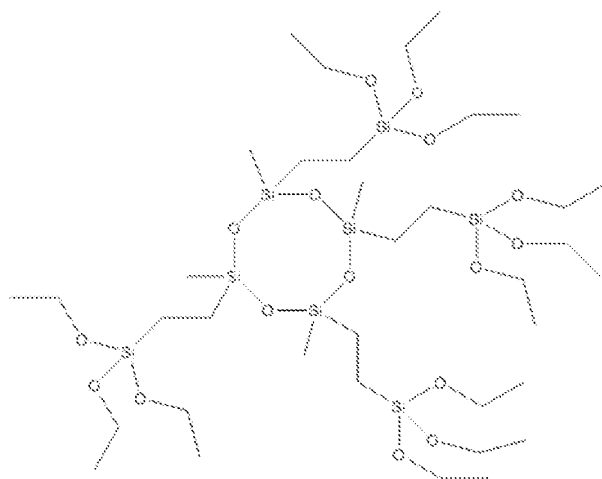
5 6. The imprinting apparatus as defined in claim 1, wherein the largest opening dimension of each of the plurality of features ranges from about 200 nm to about 250 nm.

10 7. The imprinting apparatus as defined in claim 1, wherein the average pitch ranges from about 340 nm to about 410 nm.

8. The imprinting apparatus as defined in claim 1, wherein the average pitch ranges from about 350 nm to about 400 nm.

15 9. A method, comprising:
 applying a formulation on a surface of a silicon master including a plurality of features positioned at an average pitch of less than about 425 nm, each of the plurality of features having a largest opening dimension being less than about 300 nm, the formulation including:

20 a first silane monomer:

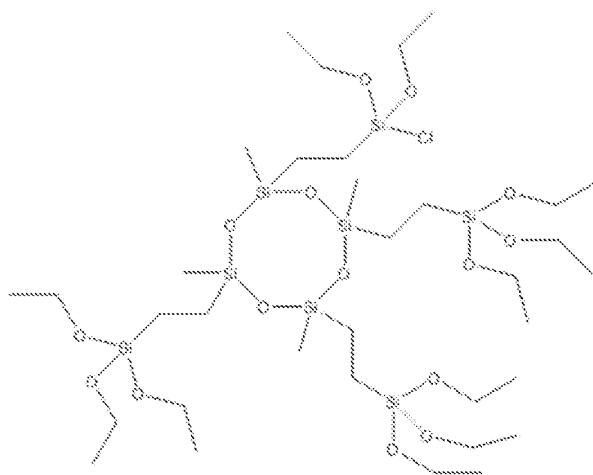


; and

less than about 1.4 wt%, based on a total amount of silanes present in the formulation, of a second silane monomer including a hydrolyzable chloride group; and curing the applied formulation, thereby forming an anti-stick layer.

5

10. The method as defined in claim 9, wherein the second silane monomer is:



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11. The method as defined in claim 10, wherein the formulation includes from about 0.28 wt% to about 1.1 wt% of the second silane monomer.

12. The method as defined in claim 9, wherein the formulation further includes:

15

i) a dimer including two bonded units of the first silane monomer;
 ii) a trimer including three bonded units of the first silane monomer;
 iii) a higher molecular species including more than three bonded units of the first silane monomer;

20

iv) the first silane monomer having at least one hydrolyzed ethoxy group; or
 v) any combination of i), ii), iii), and iv).

13. The method as defined in claim 9, wherein curing involves:
 an incubation process;

a rinsing process after the incubation process; and
a heating process after the rinsing process.

14. The method as defined in claim 13, wherein the incubation process and
5 the heating processes are independently performed at a temperature ranging from
about 20°C to about 250°C, for a time ranging from about 1 minute to about 30
minutes.

15. The method as defined in claim 9, further comprising generating the
10 formulation by:
diluting a neat silane material including the first and second silane
monomers in a first solvent to form a precursor solution;
exposing the precursor solution to an aqueous, basic solution to generate an
aqueous phase and an organic phase, wherein the organic phase includes the first
15 solvent;
removing the aqueous phase;
removing the first solvent from the organic phase to obtain a purified silane
material; and
diluting the purified silane material in a second solvent.

20 16. The method as defined in claim 15, wherein the second solvent is an
aprotic solvent that i) solvates the purified silane material and ii) has a boiling point
ranging from about 50°C to about 250°C.

25 17. The method as defined in claim 15, wherein the purified silane material
is present in the formulation in an amount ranging from about 1 wt% to about 20
wt%.

18. The method as defined in claim 9, wherein applying the formulation
30 involves spin coating.

19. The method as defined in claim 9, wherein one of:
the formulation is solvent free; or

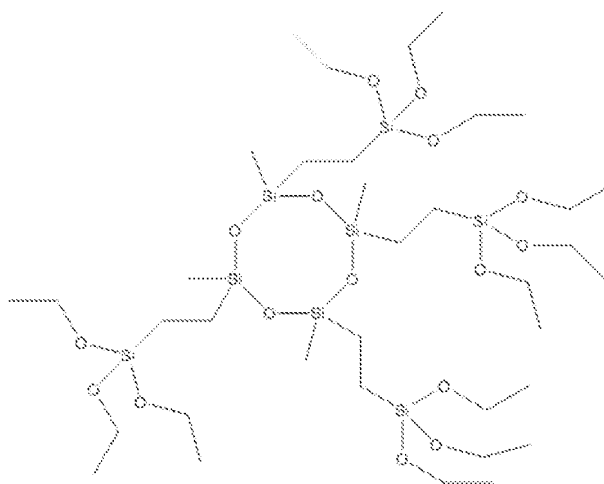
the formulation includes from about 1 wt% to about 20 wt% of the first silane monomer.

20. A method, comprising:

5 forming an imprinting apparatus by:

depositing a formulation on a silicon master including a plurality of features positioned at an average pitch of less than about 425 nm, each of the plurality of features having a largest opening dimension of less than about 300 nm, and the formulation including:

10 a first silane monomer:



; and

less than 1.4 wt%, based on a total amount of silanes present in the formulation, of a second silane monomer including a hydrolyzable chloride group; and

15 curing the formulation, thereby forming an anti-stick layer on the silicon master:

depositing a silicon-based working stamp material on the anti-stick layer of the imprinting apparatus;

20 curing the silicon-based working stamp material to form a working stamp including a negative replica of the plurality of features; and releasing the working stamp from the imprinting apparatus.

21. The method as defined in claim 20, wherein curing the formulation involves:
- an incubation process;
 - a rinsing process after the incubation process; and
 - 5 a heating process after the rinsing process.
22. The method as defined in claim 21, wherein the incubation and heating processes are independently performed at a temperature ranging from about 20°C to about 250°C, for a time ranging from about 1 minute to about 30 minutes.
- 10 23. The method as defined in claim 20, wherein the silicon-based working stamp material includes a silicon acrylate monomer.