molecules adsorbed at the two hydrophilic surfaces. With the progressive establishment of hydrogen bonds at the edges of the already bonded area, the bonded area gradually increases. A bonding wave thus propagates until it reaches the edge of at least one of the substrates. Any disturbance of the bonding wave propagation or of the bonding wave closure at the edge of a substrate may lead to the trapping of an air bubble 9. Such air bubbles 9 locally prevent the substrates to bond, which causes holes in the layer 8 separated from the source substrate 1b and bonded to the glass-based support substrate 1a, as represented in figure 2.

There is consequently a need for a method for bonding the two substrates that avoids the trapping of bubbles during the molecular bonding.

SUMMARY OF THE INVENTION

Embodiments~~The aim~~ of the present invention seek~~is~~ to provide high quality bubble-free bonded substrates of silicon and glass. Moreover, embodiments of the present invention also seek to provide~~aims at providing~~ an efficient bonding of series of substrates, in order to speed up industrial processes and save cost.

According to an aspect of~~For these purposes,~~ the present invention, there is provide~~d~~ a method for bonding a first substrate having a first surface to a second substrate having a second surface, the method~~characterized in that it~~ comprise~~s~~ing the steps of:

- holding the first substrate by at least two support points,
- positioning the first substrate and the second substrate so that the first surface and the second surface face each other,
- deforming the first substrate by applying between at least one pressure point and the two support points, a strain toward the second substrate,
- bringing the deformed first surface and the second surface into contact,
- progressively releasing the strain~~.~~,

wherein the surface area of the convex hull formed by the set of pressure points is null and the surface area of the convex hull formed by the set of support and pressure points is non-null.

Preferred but non limiting features according to embodiments of the present invention are as follow:

~~• the surface area of the convex hull formed by the set of pressure points is~~ null and the surface area of the convex hull formed by the set of support and ~~pressure points is non-null;~~.

- the first substrate is held by suckers placed at the support points;
- each sucker is linked to a telescopic arm;
- the second substrate is placed on a support comprising at least two spacers respectively on each sides of the second substrate, said spacers being higher than the thickness of the second substrate;
- the first substrate is held by resting on the spacers, the support points being points of contact between the spacers and the first substrate;
- the support comprises at least one sucker holding the second substrate;
- the strain is applied by at least one piston rod;
- the first substrate is a glass sheet, and wherein the second substrate is a silicon tile;
- the first substrate is sequentially bonded to a plurality of second substrates by applying a strain to the first substrate per second substrate;
- the at least one piston rod is mounted on a mobile device and sequentially applies each strain to the first substrate;
- the first substrate is simultaneously bonded to a plurality of second substrates by deforming the whole first substrate.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of this invention will be apparent in the following detailed description of an illustrative embodiment thereof, which is to be read in connection with the accompanying drawings wherein:

- Figure 1 previously described represents steps of a known process for making SiOG structures ;
- Figure 2 previously described is a traversal view of a detail of a defect due to the presence of a bubble in a SOI structure ;