WHAT IS CLAIMED IS:

1. A method of processing a plate-shaped workpiece, comprising:

a workpiece supporting step of placing the plate-shaped workpiece on an upper surface of a sheet whose area is larger than that of the plate-shaped workpiece through a liquid resin interposed therebetween and supporting the plate-shaped workpiece on only the liquid resin that has solidified and the sheet, wherein the plate-shaped workpiece, the solidified liquid resin and the sheet jointly form an integral assembly having a degree of rigidity such that the sheet is kept flat when the sheet is supported at two diametrically opposite points on an outer circumferential edge portion thereof;

a processing step of processing the plate-shaped workpiece to divide the plate-shaped workpiece into a plurality of chips; and

a pick-up step of picking up the chips from the sheet,

wherein the method is performed without using a frame that supports the plate-shaped workpiece.

2. The method of processing a plate-shaped workpiece according to claim 1, further comprising:

an expanding step of expanding the sheet to widen

distances between the chips.

3. The method of processing a plate-shaped workpiece according to claim 1, further comprising:

after the pick-up step, a discarding step of discarding the sheet.

4. The method of processing a plate-shaped workpiece according to claim 1, wherein the processing step includes a cutting step of positioning a cutting blade on a region to be divided of the plate-shaped workpiece and cutting the plate-shaped workpiece with the cutting blade.

5. The method of processing a plate-shaped workpiece according to claim 1, wherein the processing step includes a laser ablation step of applying a laser beam having a wavelength absorbable by the plate-shaped workpiece to a region to be divided of the plate-shaped workpiece to form grooves in the plate-shaped workpiece by way of laser ablation.

6. The method of processing a plate-shaped workpiece according to claim 1, wherein the processing step includes a modified layer forming step of applying a laser beam having a wavelength transmittable through the plate-shaped workpiece to a region to be divided of the plate-shaped workpiece while positioning a focused spot

of the laser beam within the plate-shaped workpiece, to form modified layers in the plate-shaped workpiece.

7. The method of processing a plate-shaped workpiece according to claim 1, wherein the plate-shaped workpiece is a wafer including a face side having a plurality of devices formed in respective areas demarcated thereon by a plurality of projected dicing lines, the face side of the wafer or a reverse side thereof being placed on the upper surface of the sheet through the liquid resin interposed therebetween.

8. The method of processing a plate-shaped workpiece according to claim 1, wherein the sheet is made of a polyester- or polyethylene-based material.

9. The method of processing a plate-shaped workpiece according to claim 1, wherein the liquid resin is an acryl-, rubber-, silicone-, or epoxy-based liquid resin.