[0033] FIG. **2**B illustrates an embodiment of a workpiece object **210**B at a suitable time to stop an etch **218** of the release layer **214** of FIG. **2**A. As shown, the etch may be stopped after the semiconductor devices **216** have been at least substantially released, and while protuberances **220-1**, **220-2** (collectively protuberances **220**) and/or non-flat surfaces **221-1**, **221-2** (collectively non-fiat surfaces **221**) remain between each of the respective semiconductor devices **216** and the substrate **212**. The protuberances **220** and/or non-flat surfaces **221** have been etched from the release layer **214** (e.g., carved out of the release layer). In particular, a first protuberance **220-1** and/or non-flat surface **221-1** have been etched between the first semiconductor device **216-1** and the substrate **212**, and a second protuberance **220-2** and/or non-flat surface **221-2** have been etched between the second semiconductor device **216-2** and the substrate **212**. Openings **222** have been defined between the protuberances and the semiconductor devices where portions of the release layer **214** have been etched away or removed while carving out the protuberances.

[0034] In the illustrated embodiment, the semiconductor devices **216** are still optionally partially coupled with the respective protuberances **220**, although this is not required. However, the semiconductor devices are coupled with the protuberances along smaller areas of contact and/or by weaker couplings than prior to the etch. For example, as shown in the illustrated embodiment, the protuberances may be shaped approximately like hemispherical protuberances with only the tops or apexes of the hemispherical protuberances coupled with the bottoms of the semiconductor devices, although the scope of the invention is not so limited. Such couplings on such small areas of contact and/or such weak couplings can be readily broken or severed, as will be described further below. In other embodiments, the etching may be allowed to continue further until the semiconductor devices have been fully released from the substrate (e.g., until there is a gap between the tops of the protuberances and the bottoms of the semiconductor devices). Having the devices fully released may make it easier to separate them front the substrate. As will be described further below, anchors may optionally be thrilled or applied to anchor or support the semiconductor devices. It is to be appreciated that the scope of the invention is not limited to the particular hemispherical protuberances. Rather, any of the other shaped protuberances mentioned elsewhere herein, any others appreciated by those skilled in the art and having the benefit of the present disclosure, may be used instead.

[0035] One significant advantage to forming the protuberances **220** and/or the non-flat surfaces **221** between the semiconductor devices **216** and the substrate **212** is that it may help to prevent or at least reduce generally undesired attractive forces between the semiconductor devices and the substrate. The protuberances and/or non-flat surfaces may help to reduce contact areas between the semiconductor devices and other nearby surfaces. Without the protuberances or non-flat surfaces, the bottom surfaces of the semiconductor devices could potentially lie flat against the top coplanar surface of the substrate. For example, this may tend to occur in the case of a silicon dioxide layer which may also be used as a release layer (without a graded composition) for certain types of silicon based semiconductor devices when the etch is not stopped while protuberances remain. Such relatively larger surface areas in contact would generally tend to experience relatively stronger attractive forces due to stiction, static cohesion, sticking, Van der Waals type forces, hydrogen bonding forces, electrostatic forces, or the like. Such attractive forces generally tend to increase with increasing contact area. Moreover, such attractive forces may be generally undesirable because they may tend to make it more difficult to separate the semiconductor devices from the substrate. Moreover, if some semiconductor devices are stuck but others are not, this may tend to make the forces needed to separate the semiconductor devices from the substrate variable. However, the protuberances and/or the non-flat surfaces may help to reduce or limit the contact areas between the semiconductor devices and the substrate and thereby limit such attractive forces. As shown, the semiconductor devices may contact the protuberances (if they contact the protuberances at all) at relatively small contact areas (e.g., at the apexes of the protuberances). Even if the semiconductor devices slide, fall, or the like, they still may contact relatively small and often rounded or curved surfaces the protuberances (e.g., as opposed to a larger flat surface), which generally helps to reduce the amount of stiction or other attractive forces.

[0036] Referring again to FIG. **1**, the method includes separating the semiconductor devices from the substrate, at block **104**. In some embodiments, this may include increasing a distance of separation between the semiconductor devices and the substrate. In some embodiments, this may include coupling at least one receiving substrate with at least a subset of the semiconductor devices while they are coupled with the substrate, and then separating the at least one receiving substrate and at least the subset of the semiconductor devices from the substrate. Either or both of the receiving substrate and the substrate may be moved relative to one another.

[0037] FIG. **2**C illustrates an embodiment of separating **224** the semiconductor devices **216** from the substrate **212**. A receiving substrate **226** is coupled with top surfaces of the semiconductor devices **216**. By way of example, the receiving, substrate may be coupled with the top surfaces of the semiconductor devices of the workpiece object **210**B of FIG. **2**B. In some embodiments, the receiving substrate may be physically and/or electrically coupled with the semiconductor devices. For example, in some embodiments, reflowed solder bumps may be used to electrically and physically couple the receiving substrate with the semiconductor devices. As another option, in some embodiments, an adhesive material may be used to physically couple the receiving substrate with the semiconductor devices. For example, the receiving substrate may have an adhesive applied to a surface intended to contact the semiconductor devices. A combination of reflowed solder bumps (or other electrical couplings) and an adhesive material may also optionally be used.

[0038] Then, the receiving substrate **226** and the substrate **212** may be separated from one another. In various aspects, the receiving substrate may be moved relative to the substrate, the substrate may be moved relative to the receiving substrate, or both the receiving substrate and the substrate may be moved relative to one another. As mentioned above, in some embodiments, the coupling of the receiving substrate with the semiconductor devices may be physically stronger than the coupling of the substantially released semiconductor devices with the substrate. As a result, the semiconductor devices may remain bonded or coupled with the receiving substrate, and may fully release and separate from the substrate. In some embodiments, the separation may involve separating the semiconductor devices and the protuberances **220** and/or non-flat surfaces **221**. In some embodiments, the separation may involve lifting the semiconductor substrates off tops of