[0034] **Seal Arrangement and Housing**

[0035] In some embodiments, a seal and seal Housing (e.g. Disposable Seal Housing (DSH)) may be incorporated integral to the DC. **Figure 9** illustrates an exemplary DSH comprising static seal face (**2**), rotating seal face (**3**), seal spring (**4**), bearing (**5**), seal housing (**6**), seal housing cover (**7**) and retaining screw (8) affixed (e.g., removably affixed) to a shaft (**1**) of an impeller. Adaptations to traditional mechanical seals have been made in order to deploy such seals in DCs. For instance, in one embodiment, mechanical seal arrangement is enclosed in a DSH and energized within the housing enclosure. Thus, the seal is maintained within the DSH and associated shaft which may then be attached to other components of the DC to create a closed system suitable for sterilization. This disclosure enables the seal to be energized within the seal housing throughout the fabrication, sterilization, transport and use of the DC.

[0036] **Low Profile Seal Housing**

[0037] DCs typically incorporate fixtures for rotating equipment which are mechanically driven and may be sealed using various types of mechanical seals. However, there is limited space upon the DC to locate such seals and other restrictions on positioning such as seam locations. To solve such problems, this disclosure provides embodiments in which housing of the seal is positioned within the space of the DC (e.g., the interior space) thereby minimizing the external profile of the fixture. This provides multiple advantages such as, for instance, simpler handling and more efficient positioning of the fixture. An embodiment of such a low profile seal housing is illustrated in **Fig. 15**. As shown in **Fig. 15A**, this exemplary housing includes internal seal housing **1**, seal shaft **2**, first retaining rings **3**, bearing balls **4**, internal seal housing retainer **5**, second retaining ring **6** and O-ring **7**. The exemplary housing further comprises a pocket(s) for using one or more lip seals and/or additional mechanical seals to seal the housing to the DC.

[0038] **Detachable Coupling Devices**

[0039] Difficulty is also often encountered in configuring DCs and the various devices required to carry within the DC. For instance, DCs may be used with various types of stirring mechanisms. Exemplary stirring mechanims may be, for instance, impellers. Typically, a DC is constructed around an impeller or impellers integral to the DC. This presents difficulties with respect to fabrication, packaging, shipping, sterilization, and / or general handling of the DC.

This disclosure provides solutions to these problems. An exemplary solution is a detachable coupling device comprising an attachment point outside the DC and a detachable point inside the closed DC. This detachable coupling device may also be used to facilitate lifting of an apparatus (e.g., mixing shaft and assembly, perfusion apparatus) to be inserted into a DC. During assembly, the detachable coupling device may be used to handle a large apparatus to avoid damage to the DC film. The detachable coupling device thereby allows, for example, the user to lift and center a large mixing device to be manipulated prior to, during, and after DC fabrication without decoupling the coupling device from the shaft. In some embodiments, this disclosure provides a DC comprising at least one attachment mechanism that may include at least two parts, one positioned within the DC and one positioned exterior to the DC. Upon attachment to one another, the interior and exterior parts may form a single, two-part attachment mechanism. The interior part of the mechanism would typically attached to an impeller and any supporting components thereof. The DC, internal attachment mechanism and other components (e.g., the impeller) may be sterilized together prior to use. In some embodiments, then, the present disclosure provides a DC comprising an internal volume, a container comprising an attachment mechanism comprising a first attachment mechanism at least partially positioned within the internal volume of the DC and a second attachment mechanism positioned on the exterior of the container. The first and second attachment mechanisms may be reversibly attached to one another. The first attachment mechanism may further comprise an attachment mechanism for reversibly attaching a device contained within the internal volume of the DC thereto. The second attachment mechanism may further comprise an attachment mechanism for reversibly attaching a device exterior to the container thereto. Embodiments of detachable coupling devices are provided in **Figs. 10A-F** and **11.**

[0040] **Sample Port**

[0041] In some embodiments, a novel sample port may be incorporated in the DC. **Figs. 12A-C** illustrate an exemplary sample port. The disposable sample body is shown in **Fig. 12A**. The main body may be affixed to a sample port as shown in **Fig. 12B**. This sampling piece may then be adjoined to a sealing cap as shown in **Fig. 12C**. The port is typically adjoined to the DC such that the sampling piece and cap are internal to the DC and the opposite side of the port is positioned external to the DC. In one embodiment, then, this disclosure provides a sample port