connection with the sample carrier, and further comprising at least one ported external hydraulic interface to enable assay control, wherein the cartridge is configured to support a nucleic acid amplification process in which the sample remains contained within the cartridge; and

[0016] a control platform instrument for controlling the assay via the at least one ported external hydraulic interface of the cartridge, for optically detecting a result of the nucleic acid amplification process, and optionally for heating and stirring the amplification chamber.

[0017] In a second aspect, the apparatus the present invention comprises:

[0018] a) A two-piece sample carrier comprising a swab for collecting a sample to be tested, said swab with capture end and extended neck topped by a threaded cap, and a body with compartment for accepting said swab, and further comprising a threaded upper lip and lower tubular nose with axial orifice, said orifice with inner seal;

[0019] b) A disposable microfluidic cartridge with external surfaces and with internal works, the microfluidic cartridge further comprising a bridging manifold with first fluidic channel in fluidic connection with a sample receiving receptacle, a means for sealingly accepting the tubular nose of said sample carrier in said sample receiving receptacle, a means for fluidically joining said first fluidic channel to said sample carrier, valve means for introducing and withdrawing lysis reagent to and from said compartment, a means for extracting a target nucleic acid from a sample lysate, a means for eluting a target nucleic acid, an amplification chamber and stirrer means for amplifying a nucleic acid in a sample eluate, a lightpath through said chamber for detecting an amplification product by optical detection means; and,

[0020] c) An control platform instrument with means for sealedly engaging and controlling said internal works of said microfluidic cartridge; and, said means for sealingly engaging and controlling comprising at least one ported external hydraulic interface on said microfluidic cartridge.

[0021] d) Wherein said means for sealingly accepting the tubular nose of said sample carrier in said sample receiving receptacle, said means for fluidically joining said first fluidic channel to said sample carrier, and said means for sealedly engaging and controlling said internal works are configured to isolate said nasal swab, internal works of said microfluidic cartridge, external surfaces, and instrument, from forward and reverse contamination.

[0022] According to a third aspect the present invention provides a method for testing for presence of a target nucleic acid, the method comprising:

[0023] docking a sample carrier carrying a sample to be tested into a dock of a microfluidic cartridge;

[0024] applying a fluidics technique to move the sample via a sealed fluidic connection from the sample carrier to at least one chamber of the microfluidic cartridge;

[0025] conducting a nucleic acid amplification process in which the sample remains contained within the microfluidic cartridge; and

[0026] optically detecting a result of the nucleic acid amplification process.

[0027] In another embodiment, the method for assaying a biosample for a target nucleic acid comprising:

[0028] a) Collecting a sample with a swab and threadedly sealing said swab in a sample compartment in a sample carrier; said sample carrier further with tubular nose with central orifice, said orifice with inner seal; then,

[0029] b) Sealingly pressing said sample carrier into a sample receiving receptacle of a microfluidic cartridge, said sample receiving receptacle with piercing means, thereby piercing said inner seal and fluidically joining said sample compartment with a first fluidic channel of said microfluidic cartridge; thereafter,

[0030] c) Engaging said microfluidic cartridge in a control platform instrument; and,

[0031] d) Sealedly introducing and withdrawing a lysis reagent to and from said sample compartment via said first fluidic channel, thereby forming a sample lysate; and aspirating said lysate into an isolation chamber on said microfluidic cartridge; and therein,

[0032] e) Sealedly extracting a target nucleic acid from said sample lysate nucleic acid onto a solid phase matrix, thereby forming a solid phase retentate; and,

[0033] f) Sealedly eluting the target nucleic acid from said solid phase matrix, thereby forming an eluate; and further,

[0034] g) Sealedly amplifying said target nucleic acid; before,

[0035] h) Sealedly detecting amplification products by optical detection means;

[0036] i) And further having controlled said steps of the assay by activating electrical and hydraulic control interfaces of said control instrument platform; before finally,

[0037] j) Disposing said microfluidic cartridge.

[0038] The result of the nucleic acid amplification process may be either the presence or absence of an amplification product, which in turn indicates whether or not the target nucleic acid was present in the sample.

[0039] The target nucleic acid targeted by the amplification process may be a nucleic acid of an infectious agent, so that such embodiments of the present invention provide for infectious disease testing. Alternatively, the nucleic acid targeted by the amplification process may be a nucleic acid of a human or animal subject, so that such embodiments of the present invention provide for genetic testing of the subject.

[0040] Docking of the sample carrier to the microfluidic cartridge is preferably substantially irreversible, such that the sample carrier can not be undocked with the same ease with which it can be docked. Such embodiments may assist in ensuring that each sample carrier and microfluidic cartridge is used once only. For example, the docking of the sample carrier to the cartridge may be achieved by a one way snap-fit arrangement, such that the sealed fluidic connection between the sample carrier and the cartridge can only be established by effecting the one way snap-fit. In such embodiments the sample carrier may comprise one or more resiliently flexible barbs constituting a male part of the dock, to be captured by a matching recess of the microfluidic cartridge constituting a female part of the dock.

[0041] The sample is preferably contained within the sample carrier in a bio-safe manner until docking of the sample carrier to the microfluidic cartridge is effected. The sealed fluidic connection between the sample carrier and the microfluidic cartridge may be provided by a needle of the microfluidic cartridge piercing the sample carrier. Preferably, the needle or sharp is recessed or is retracted prior to docking and is mounted such that it advances to pierce the sample carrier only upon docking being effected. The dock preferably encompasses the needle to ensure sealing of the fluidic connection provided by the needle.

[0042] Transfer of the sample from the sample carrier to the microfluidic cartridge may be effected by aspiration applied