professional installation, are not accessible to the general public *per se*, and have not been used to kill COVID-19. Moreover, filtration in an HVAC system can be ineffective. COVID-19 measures between 0.05 to 0.2 microns, but HEPA filters can filter particulate larger than 0.3 microns so additional protection is needed against the spread of COVID-19.

[0011] For these reasons, the subject matter of the present disclosure is directed to overcoming, or at least reducing the effects of, one or more of the problems set forth above.

SUMMARY OF THE DISCLOSURE

[0011a] According to a first aspect of the present invention, there is provided an apparatus used with supplied power for treating air flow of an air handing system, the apparatus comprising:

a frame having a plenum with an inlet and an outlet, the frame being configured to position in the air flow of the air handing system for passage of the air flow therethrough;

a filter disposed across a surface area of the plenum and comprising a first material, the filter being configured to filter the air flow therethrough up to a filtration threshold; and

a heater disposed across the surface area of the plenum and comprising a permeable barrier of metal material, the permeable barrier of the heater being configured to impede the air flow therethrough up to an impedance threshold, the permeable barrier of the heater connected in electrical communication to the supplied power and being heated to a surface temperature.

[0011b] According to a second aspect of the present invention, there is provided an apparatus for use with supplied power for treating air flow of an air handing system for a pathogen, the apparatus comprising:

a heater comprising permeable barrier of a metal material, the permeable barrier having a surface area exposed to the air flow and being configured to impede the air flow therethrough up to an impedance threshold, the permeable barrier connected in electrical communication to the supplied power and being heated to a surface temperature directed to the pathogen.

[0011c] According to a third aspect of the present invention, there is provided a method for treating air flow of an air handing system for a pathogen, the method comprising:

positioning a frame in the air handling system for passage of the air flow therethrough;

filtering the air flow up to a filtration threshold through a filter disposed across a surface area of a plenum of the frame between an inlet and outlet;

impeding the air flow up to an impedance threshold through a permeable barrier of heater disposed across the surface area the plenum and having a metal material; and

heating the permeable barrier of the heater to a surface temperature directed to the pathogen by supplying a voltage potential across the permeable barrier.

[0012] The subject matter of the present disclosure is directed to a purification device that filters air and seeks to destroy viruses, bacteria, mold, pollens, volatile organic compounds, allergens, and pollutants. The purification device is intended to be affordable, easily installed, accessible and useable in both residential and commercial settings. The purification device can be applied to real world solutions to best reduce viruses, such as COVID-19, and other pathogens in the circulating air, and the purification device can be deployed as a specialized heated filter for use in commercial, residential, mass transit, and public venues.

[0013] For example and as discussed below, the purification device includes a barrier heater or heated filter that uses targeted thermal conduction of high efficiency nickel foam/mesh raised to temperatures proven to kill pathogens, such as corona viruses (such as COVID-19). The purification device also includes an ultraviolet (UV) light source that uses UV-C light to destroy the virus. The UV light source and the barrier heater are combined together in a flame retardant and resistant filtration system, which can then be directly integrated into air returns, furnace intakes, and other parts of an air handling system of a facility or populated environ, such as an airport terminal, church, hospital, workshop, office space, residence, transit vehicle, school, hotel, cruise ship, recreational venue, etc. As there is no current cure for COVID-19 and many other pathogens, environmental purification strategies can help slow the spread of the virus, and the air purification provided by the disclosed device can provide a primary defense against transmission.

[0014] In one configuration, an apparatus is used with supplied power for treating air flow of an air handing system of a facility. The apparatus comprises a frame, a filter, and an UV light source, and a heater. The frame has a plenum with an inlet and an