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(54) **SOFT HOOD WITH OUTLET FILTER**

(57) The present disclosure relates to a soft hood (102) for a powered air purifying respirator (100), wherein the soft hood (102) is configured to cover a user's face, when in use, and comprises: an air inlet port (108) for introducing forced air flow into the soft hood; and one or

more air outlet filter (120) for filtering aerosols out of air flowing through the one or more air outlet filter, the air outlet filter (120) being arranged such that air exiting the soft hood (102) passes through said one or more outlet filter.

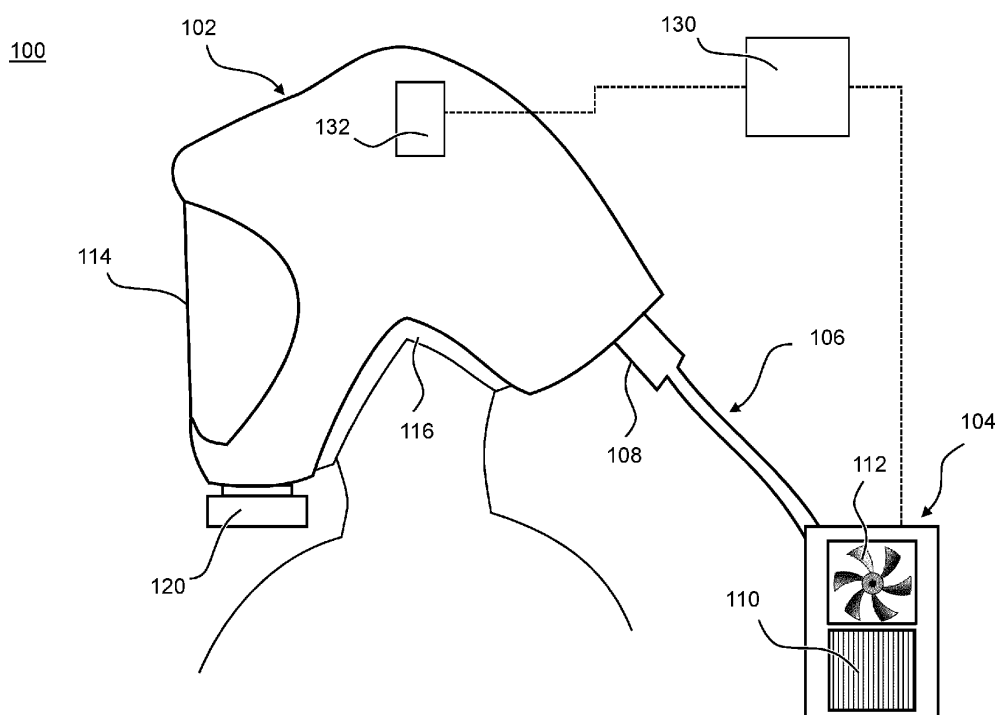


Figure 1

Description

Background of the Invention

[0001] The present disclosure relates to a soft hood for a powered air purifying respirator. The soft hood of the present disclosure may be used particularly, but not exclusively, in the medical field to protect a user from harmful pathogens dissolved within the air. Other aspects of the present disclosure relate to a powered air purifying respirator (PAPR) and an air filter for soft hoods of a PAPR.

[0002] Soft hoods, sometimes also referred to as medical hoods, are loose fitting head covers that, when in use, expand over a user's head and face to protect the user from the surrounding environment. Such soft hoods create a sterile environment around the user's head, so as to protect the user from harmful aerosols within the atmosphere. They may be used during high risk surgical procedures or in regions infected with highly contagious pathogens, virus, bacteria, protozoan, prion, viroid, or fungus.

[0003] In order to provide a safe breathing zone for the operator, soft hoods may be connected to an inlet filter for cleaning the surrounding air before it enters the sterile breathing zone within the hood. In order to avoid contaminated air entering the soft hood through spaces that are not covered by the inlet filter (sometimes referred to as "back leakage"), the air chamber within the soft hood may be provided with a positive air pressure by means of forced air flow introduced into the soft hood via an air blower.

[0004] Soft hoods for powered air purification respirators may be provided with forced air flow at a minimum flow rate of 140 l/min. This is to achieve sufficient positive pressure, such that any gaps between the soft hood and the body (e.g. the neck) of the user will not allow outside air to leak into the sterile environment within the soft hood. Rather, the positive pressure within the soft hood will cause any air gaps to be filled with air flow leaving the soft hood, thereby preventing back leakage into the soft hood.

[0005] Part of the forced air flow introduced into the soft hood will be inhaled by the user. The remaining parts of the forced air flow may (continuously) leave the soft hood via an air outlet port. Such air outlet ports might either be defined by one or more openings, e.g. at the bottom of the hood, or by a one-way valve that only allows air to be expelled from the soft hood. These openings/one way valves are required to prevent the positive pressure within the soft hood from becoming excessive.

[0006] If the pressure within the soft hood becomes too large, gaps form between the soft hood and the user's body (e.g. their neck/face) allowing air to escape in various place, thereby leading to discomfort for the user and significant noise. In view of the above, existing soft hoods for powered air purifying respirators require a free opening to expel excess air from the hood fast enough to avoid

excessive pressure within the soft hood.

[0007] A problem with guiding excess air flow out of the soft hood via the openings or one way valves is that any pathogens present within the soft hood are expelled at an increased flow rate. For example, if the user of the soft hood carries a virus and is, therefore, infectious, any air exhaled by the user, and expelled from the hood, may pose risk to the health of people surrounding the user. This is particularly so because the flow rate of air exhaled by the user within the surgical hood is accelerated by means of the forced air flow by a magnitude of 5 to 10 and is, thus, distributed much further into the outside environment than would be the case if the user breathed normally, i.e. without the support of a PAPR.

[0008] It is an aim of the present disclosure to solve or at least ameliorate one or more problems of the prior art.

Summary of the Invention

[0009] Aspects and embodiments of the disclosure provide soft hood and a PAPR as claimed in the appended claims.

[0010] According to an aspect of the present disclosure, there is provided a soft hood for a powered air purifying respirator, wherein the soft hood is configured to cover a user's face, when in use, and comprises: an air inlet port for introducing forced air flow into the soft hood; and one or more air outlet filter for filtering aerosols out of air flowing through the one or more air outlet filter, the air outlet filter being arranged such that air exiting the soft hood passes through said one or more outlet filter.

[0011] In one embodiment, the one or more air outlet filter has a pressure drop between 100Pa and 200Pa when forced air flow at a flow rate of 150L/min to 250L/min is introduced into the soft hood.

[0012] In another embodiment, the one or more air outlet filter comprises a filter media spanning an area of 20cm² to 100cm², preferably 40cm² to 80cm², more preferably 50cm² to 70cm².

[0013] In another embodiment, wherein the one or more air outlet filter comprises a pleated filter media.

[0014] In another embodiment, the one or more outlet filter is configured to remove airborne particulates of a diameter of at least 0.1 μm, preferably at least 0.05 μm.

[0015] In another embodiment, the one or more outlet filter comprises a HEPA filter media.

[0016] In another embodiment, the one more outlet filter comprises a filter media made from polypropylene, polyester, glass fibre, or PTFE.

[0017] In another embodiment, the one or more air filter comprises a filter media exhibiting at least 99.8% efficiency of aerosols of 0.05 μm in diameter, at a flow rate of 150L/min to 250L/min.

[0018] In another embodiment, the one or more air outlet filter comprises a one-way filter media, arranged such that air is prevented from entering the soft hood via the one or more air inlet filters.

[0019] In another embodiment, the air outlet filter com-

prises a housing and a filter media, the filter media being removably received within the housing.

[0020] In another embodiment, the housing is removably connectable to a shell or a visor of the soft hood.

[0021] In another embodiment, the soft hood is configured to define an air chamber around a user's face, when in use.

[0022] In another embodiment, the soft hood has a deflated state, in which the air chamber is at atmospheric pressure, and an inflated state, in which the air chamber is at a pressure above atmospheric pressure.

[0023] In another embodiment, the soft hood is transferrable between its deflated and inflated state by introducing forced air flow into the soft hood via the air inlet port.

[0024] In another embodiment, the soft hood comprises a sealing arrangement configured to rest against a user's head and/or neck, when in use, the sealing arrangement preventing air from exiting the soft hood anywhere other than the air outlet filter.

[0025] In another embodiment, the sealing arrangement comprises: an elastic sealing strip with a first part arranged to rest against a user's jaw when in use; a sealing cushion arranged along an inner surface of the first part of the elastic sealing strip, the sealing cushion comprising flaps protruding over the sealing strip in a longitudinal direction of the sealing strip, wherein said flaps are freely movable with respect to the elastic sealing strip.

[0026] According to another aspect of the present disclosure, there is provided a powered air purifying respirator (PAPR) comprising: a soft hood according to the above; an air blower unit for generation of forced air flow; and an air supply hose or duct for supply of forced air flow from the air blower unit to the soft hood.

[0027] In another embodiment, the PAPR comprises a control unit configured to: receive pressure-data indicative of an air pressure within the soft hood; and control the forced air flow generated by the air blower unit on the basis of the pressure-data.

[0028] In another embodiment, the control unit is configured to: set the forced air flow rate generated by the air blower to a default air flow rate; determine on the basis of the pressure-data the pressure within the soft hood; compare the pressure within the soft hood to a first pressure threshold; and reduce the air flow generated by the air blower, if the pressure within the soft hood exceeds the pressure threshold.

[0029] In another embodiment, the control unit is configured to alarm the user of the soft hood when the pressure within the soft hood exceeds the first pressure threshold.

[0030] According to another aspect of the present disclosure, there is provided a full face head cover for a powered air purifying respirator, wherein the head cover is configured to cover a user's face and establish an enclosed breathing zone around the user's face, when in use, the head cover comprising: an air inlet port for introducing forced air flow into the soft hood; and one or

more air outlet filter for filtering aerosols out of air flowing through the one or more air outlet filter, the air outlet filter being arranged such that air exiting the soft hood passes through said one or more outlet filter.

[0031] According to another aspect of the present disclosure, there is provided a powered air purifying respirator (PAPR) comprising the above head cover.

[0032] According to another aspect of the present disclosure, there is provided an air outlet filter for a full face head cover of a PAPR, said air outlet filter having a pressure drop between 100Pa and 200Pa when forced air flow at a flow rate of 150L/min to 250L/min is introduced into the head cover. The head cover may be a soft hood or a hard shell cover.

[0033] In another embodiment, the one or more air outlet filter comprises a filter media spanning an area of 20cm² to 100cm², preferably 40cm² to 80cm², more preferably 50cm² to 70cm².

[0034] In another embodiment, wherein the one or more air outlet filter comprises a pleated filter media.

[0035] In another embodiment, the one or more outlet filter is configured to remove airborne particulates of a diameter of at least 0.1 μm , preferably at least 0.05 μm .

[0036] In another embodiment, the one or more outlet filter comprises a HEPA filter media.

[0037] In another embodiment, the one more outlet filter comprises a filter media made from polypropylene, polyester, glass fibre, or PTFE.

[0038] In another embodiment, the one or more air filter comprises a filter media exhibiting at least 99.8% efficiency of aerosols of 0.05 μm in diameter, at a flow rate of 150L/min to 250L/min.

[0039] In another embodiment, the one or more air outlet filter comprises a one-way filter media, arranged such that air is prevented from entering the soft hood via the one or more air inlet filters.

[0040] In another embodiment, the air outlet filter comprises a housing and a filter media, the filter media being removably received within the housing.

[0041] In another aspect of the present disclosure, there is provided a sealing arrangement for a full face head cover with an air outlet port, said sealing arrangement being configured to rest against a user's head and/or neck, when in use, so as to prevent air from exiting the soft hood anywhere other than the air outlet port.

[0042] In one embodiment, the sealing arrangement comprises: an elastic sealing strip with a first part arranged to rest against a user's jaw when in use; a sealing cushion arranged along an inner surface of the first part of the elastic sealing strip, the sealing cushion comprising flaps protruding over the sealing strip in a longitudinal direction of the sealing strip, wherein the flaps are freely movable with respect to the elastic sealing strip.

[0043] Within the scope of this application it is expressly intended that the various aspects, embodiments, examples and alternatives set out in the preceding paragraphs, and the claims and/or the following description and drawings, and in particular the individual features

thereof, may be taken independently or in any combination. That is, all embodiments and all features of any embodiment can be combined in any way and/or combination, unless such features are incompatible. The applicant reserves the right to change any originally filed claim or file any new claim accordingly, including the right to amend any originally filed claim to depend from and/or incorporate any feature of any other claim although not originally claimed in that manner.

Brief Description of the Drawings

[0044] One or more embodiments of the present disclosure will now be described by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a schematic representation of a PAPR with a soft hood according to an embodiment of the present disclosure;

Figures 2A and 2B show an air outlet filter for use with a soft hood according to an embodiment of the present disclosure;

Figures 3A and 3B show a top plan view and a side elevation of filter media within a filter housing; and

Figure 4 shows a schematic, perspective view of a hood seal for providing an airtight seal between a soft hood and a user's head/neck.

Detailed Description of the Drawings

[0045] Figure 1A shows a schematic view of an embodiment of a powered air purifying respirator (PAPR) according to the present disclosure. The PAPR 100 of Figure 1 comprises a soft hood 102 and an air blower 104. The soft hood 102 is connected to the air blower via an air duct 106.

[0046] The soft hood 102 comprises an air inlet port 108 for introducing forced air flow supplied via the air blower 104 into the soft hood 102. The soft hood 102 further comprises one or more air outlet filters 120. In the embodiment of Figure 1, the soft hood 102 comprises a single air outlet filter 120. The air outlet filter 120 is designed to filter aerosols out of the air flowing through the filter. In particular, the air filter may comprise filter media exhibiting at least 99.8% efficiency of aerosols of 0.05 micrometres in diameter, at a flow rate of 150 l/min to 250 l/min.

[0047] The soft hood 102 further comprises a visor 114 covering the user's face, when in use. The soft hood 102 comprises a flexible seal strip 116. The flexible seal strip 116 of this embodiment is arranged between the soft hood and the user's neck. The flexible seal strip 116 is configured to be biased against the user's head and/or neck, when in use. The flexible seal strip, therefore, prevents air from exiting the soft hood anywhere other than

the air outlet filter 120. The flexible seal strip 116 shown in Figure 1 may be sewn or glued to a head opening of the soft hood.

[0048] The air duct 106 may be removably connectable to the air inlet port 108. At an opposite end, the air duct 106 may be removably connected to the air blower 104.

[0049] The air blower 104 comprises an air inlet filter 110 and an impeller (or fan) 112. The impeller 112 will draw air into an air blower housing via the filter 110. Accordingly, air entering the air blower 104 via the air inlet filter 110 will be purified before it is directed towards the soft hood via the air duct 106, at an increased air flow rate. It should be understood that any suitable type of air pump may be utilised in the air blower to generate the forced air flow. The present disclosure is not restricted to the use of an impeller.

[0050] The air flow rate of the forced air flow provided by the air blower 104 may be variable and is typically above 150 l/min, e.g. between 150 l/min and 250 l/min. In some embodiments, described in more detail below, the air flow supplied by the air blower 104 may be automatically adjusted by the PAPR 100, e.g. by means of a control unit 130, on the basis of various operating parameters.

[0051] The air outlet filter 120 is provided to purify air exiting the soft hood, such that any contaminants expelled by the user may not be released into the outside environment. This is in contrast to existing soft hoods, in which no purification/filtration of the air within the soft hood is achieved.

[0052] As will be appreciated, an air outlet filter will introduce significant resistance to the forced air flow that is typically above 140 l/min. Such resistance to the air flow causes a pressure drop across the filter, meaning an increase of the positive pressure within the soft hood. If the so increased positive pressure within the soft hood exceeds a pressure limit of the hood, e.g. determined by the retaining force of the flexible seal strip 116, air within the hood will leak and create gaps between the body of the user and the edges of the hood, thereby, expelling potentially contaminated air in an uncontrollable manner.

[0053] Despite the above technical prejudice, it was found that one or more air outlet filters may be arranged on the soft hood to mitigate the risk of pathogens being expelled at a forced flow rate onto the patient of the soft hood user.

[0054] In one embodiment of the present disclosure, the air outlet filter has a pressure drop between 100 Pascal and 200 Pascal when forced air flow at flow rates of 150 l/min to 250 l/min is introduced into the soft hood. Some exemplary filter characteristics will be described in more detail with reference to Figures 2A, 2B, 3A, and 3B below.

[0055] Turning to Figures 2A and 2B, there is shown an exemplary outlet filter 220. The air outlet filter 220 comprises a housing 222 and a filter media 224 received within said housing 222. The air outlet filter 220 comprises a first side 240 that will be in contact with the interior

of the soft hood, when in use. An opposite, second side 242 will be in contact with the outside environment, when the filter 220 is connected to the soft hood.

[0056] As is derivable from the exploded view shown in Figure 2B, the filter media 224 may be received within a filter cartridge 226. The filter cartridge 226, in turn, is removably received within the housing 222 of the outlet filter 220. Accordingly, the filter media 224 may easily and quickly be removed for maintenance and/or replacement purposes.

[0057] The housing 222 comprises an inner housing part 228 and an outer housing part 230. The inner and outer housing parts 228, 230 together form a receptacle that is configured to receive the filter cartridge 226. In particular, the receptacle formed by the inner and outer housing parts 228, 230 conforms to the shape of the filter cartridge 226. In the embodiment of Figure 2B, this means that the receptacle is box-shaped, similar to the box-shape of the exemplary cartridge 226.

[0058] The inner housing part 228 comprises a lip 232. Similarly, the outer housing part 230 comprises a lip 234. When the filter housing 222 is closed (Figure 2A), the lips 232, 234 of the inner and outer housing parts 228, 230 rest against each other, and thus align the inner and outer housing parts 228, 230 correctly with each other.

[0059] The inner housing part 228 comprises an upstand 233. The upstand 233 defines an inner part of the receptacle for the filter cartridge 226 and acts to retain the filter cartridge 226 within the housing 222 when the inner housing part 228 and the outer housing part 230 are connected. The lip 232 of the inner housing part 228 is arranged circumferentially around a lower edge of the upstand 233.

[0060] In use the fabric of the soft hood (not shown) is clamped between the lip 234 of the outer housing part 230 and the lip 232 of the inner housing part 228. The fabric may further be glued to one of the lips 232, 234 (but not the other) to avoid air leaks at the interface between the fabric and the filter housing 222. Gluing the fabric to one of the lips 232, 234 only allows for a separation of the inner and outer housing parts 228, 230 from each other even when housing 222 is installed on the soft hood, so as to facilitate replacement of the filter media 224/filter cartridge 226.

[0061] A plurality of clips 236 are arranged on the lip 234 of the outer housing part 230. The clips 236 are configured to engage with the lip 232 of the inner housing part 228 in a form fitting manner, when the lip 232 of the inner housing part 228 rests against the lip 234 of the outer housing part 230. The plurality of clips 236 are deformable, so separate the lips 232, 234 and thus the inner and outer housing parts 228, 230 from each other, thereby opening the receptacle for removal of the filter cartridge 226.

[0062] The housing 222 comprises an outer cover 238. The outer cover may be arranged over the outer part 230 to protect the filter cartridge from physical damage. To this end, the outer cover 238 includes a protective grid

that allows penetration of air flow but prevents larger objects from being introduced into the filter media.

[0063] Figures 3A and 3B show a top plan view and a side view of a filter cartridge 326 according to an example of the present disclosure. As mentioned above, a filter media 324 is arranged within the filter cartridge 326. In the embodiment of Figures 3A and 3B, the filter media is a pleated filter media. The pleats of the filter media may have a depth C (Figure 3B) of 15 millimetres to 25 millimetres, preferably around 20 millimetres.

[0064] The filter media shown in Figures 3A and 3B spans an area of 20cm² to 100cm², preferably 40cm² to 80cm², more preferably 50cm² to 70cm². It will be understood that the effective surface area of the filter media is significantly larger due to the pleated layout. In the example of Figure 3A, the filter media may have a width A of around 70mm and a length B of around 90mm.

[0065] The filter media 324 may be configured to remove airborne particles of a diameter of at least 0.1 micrometres, preferably a diameter of at least 0.5 micrometres.

[0066] Turning back to Figure 1, the PAPR 100 may include a control unit 130. The control unit may be a separate unit or integrated in either the soft hood 102 or the air blower 104.

[0067] The control unit 130 is configured to receive pressure-data indicative of a pressure within the soft hood 102. To this end, the control unit may be in communication with a pressure sensor 132 arranged within the soft hood 102. The pressure sensor 132 may obtain live pressure measurements continuously or intermittently during operation and feed the pressure measurements back to the control unit 130 in the form of pressure-data. Alternatively, the control unit 130 may receive pressure-data in the form of air flow measurements, e.g. provided by the air blower 104. As is known in the art, air flow measurements may then be used by the control unit to determine the positive air pressure within the soft hood.

[0068] The control unit 130 is configured to control the forced air flow generated by the air blower 104 on the basis of the pressure-data. To this end, the control unit 130 is in communication with the air blower 104 to provide control-signals for changing the air flow rate.

[0069] In one example, the control unit is configured to set the forced air flow rate generated by the air blower to a default air flow rate as the PAPR is activated. Such a default air flow rate may be 160 l/min. As will be understood, the air outlet filter 120 is designed such that the correct amount of pressure drop (and, therefore, positive pressure within the soft hood) is achieved at the default air flow rate (e.g. 160 l/min).

[0070] Over time, the filter media of the air outlet filter 120 will become more and more clogged up by aerosols exhaled by the user, such that the pressure drop caused by the forced air flow introduced into the soft hood will increase, thereby increasing the positive pressure within the soft hood. Such an increase in pressure will be determined by the control unit 130 on the basis of the pres-

sure-data discussed above.

[0071] If the pressure within the soft hood exceeds an acceptable threshold, the result may be air leakage, e.g. between the flexible seal strip 116 and the user's neck. Such air leakage would negate the positive effects of the air outlet filter 120 and could, thus, lead to contamination of the area around the user. Accordingly, the control unit 130 is configured to prevent air leakages by monitoring the pressure within the soft hood.

[0072] In a particular example, the control unit may compare the pressure within the soft hood to a first pressure threshold. This first pressure threshold may be a maximum allowable positive air pressure within the soft hood. The first pressure threshold may be determined by the manufacturer and/or by the operator.

[0073] The control unit 130 is configured to reduce the air flow generated by the air blower 104, if the pressure within the soft hood exceeds the pressure threshold. This reduction in air flow can temporarily avoid excessive air pressures within the soft hood 102, thereby preventing any undesired air leakages. The control unit 130 may be configured to reduce the air flow rate on the basis of a difference between the current pressure within the soft hood and the first pressure threshold. For example, the control unit 130 may reduce the air flow rate more the more the pressure within the soft hood exceeds the pressure threshold.

[0074] Additionally, or alternatively, the control unit 130 may be configured to alarm the user of the soft hood 102 when the pressure within the soft hood exceeds the first pressure threshold. In some examples, the control unit 130 may be in communication with a speaker to create an acoustic alarm signal to the user when the first pressure threshold is exceeded. Any other form of alarm of the user, such as visual or haptic signals are, of course, also viable.

The user receiving the alarm may decide to distance themselves from other individuals and consider replacing the air filter media before continuing their activity.

[0075] Figure 4 shows a schematic, perspective view of a sealing arrangement 400. The sealing arrangement comprises a flexible sealing strip 416, similar to the flexible sealing strip 116 shown in Figure 1. The flexible sealing strip may be made from any suitable elastomeric material that allows the sealing strip to be stretched by the user's head/neck when in use, so such that the flexible sealing strip rests tightly against the user's head/neck.

[0076] The flexible sealing strip 416 comprises a first part 420, arranged to rest against a user's jaw, when in use, and a second part 422 arranged to rest against the back of a user's head. The first and second parts 420, 422 of the flexible sealing strip 416 are constructed as a unitary structure. The first and second parts 420, 422 of the flexible sealing strip 416 shown in Figure 4 extend at an obtuse angle with respect to each other and are connected to each other at two connection points 418a and 418b.

[0077] The flexible sealing strip may be permanently

connected to the fabric of the soft hood by means of sewing or gluing along its entire length.

[0078] The sealing arrangement 400 comprises a sealing cushion 430. The sealing cushion may be made of polyester foam. In some embodiments, the sealing cushion 430 may be wrapped in a polyester cloth for additional comfort.

[0079] The sealing cushion 430 extends along an inner surface of the first part 420 of the flexible sealing strip 416. Accordingly, when the sealing arrangement 400 is in use, the first part 420 of the flexible sealing strip 416 will not be in direct contact with the user's jaw. Rather, the sealing cushion 430 will be arranged between the first part 420 and the user's jaw, such that the sealing cushion 430 will rest against the user's jaw.

[0080] The sealing cushion 430 arranged between the first part 420 of the sealing strip 416 and the user's jaw will provide additional comfort.

[0081] The sealing cushion 430 comprises first and second flaps 432a, 432b protruding from the first part 420 of the sealing strip 416, beyond the connection points 418a, 418b. The first and second flaps 432a, 432b are freely movable/bendable, i.e. the flaps 432a, 432b are not rigidly connected to the fabric of the soft hood. Rather only parts of the sealing cushion 430 that extend along the first part 420 of the elastic sealing strip 416 are permanently connected to the soft hood, e.g. sewn or glued to the fabric of the hood.

[0082] Since the flaps 432a, 432b are freely moveable, they provide an improved fit of the sealing arrangement 400 against a user's head. In particular, the foam sealing cushion may compensate for sometimes significant differences in user's jaw lines and provide a reliable fit for a large number of individuals.

[0083] Although the present disclosure referred to the example of soft hoods, it should be understood that the invention is applicable to any enclosed head covers for PAPR. For example, the filter and/or sealing arrangement may also be used in connection with hard shell head covers.

[0084] Preferences and options for a given aspect, feature or parameter of the disclosure should, unless the context indicates otherwise, be regarded as having been disclosed in combination with any and all preferences and options for all other aspects, features and parameters of the disclosure.

Claims

1. A soft hood for a powered air purifying respirator, wherein the soft hood is configured to cover a user's face, when in use, and comprises:
 - an air inlet port for introducing forced air flow into the soft hood; and
 - one or more air outlet filter for filtering aerosols out of air flowing through the one or more air

- outlet filter, the air outlet filter being arranged such that air exiting the soft hood passes through said one or more outlet filter.
2. The soft hood of Claim 1,
wherein the one or more air outlet filter has a pressure drop between 100Pa and 200Pa when forced air flow at a flow rate of 150L/min to 250L/min is introduced into the soft hood.
 3. The soft hood of Claim 1 or 2,
wherein the one or more air outlet filter comprises a filter media spanning an area of 20cm² to 100cm², preferably 40cm² to 80cm², more preferably 50cm² to 70cm².
 4. The soft hood of any one of Claims 1 to 3,
wherein the one or more air outlet filter comprises a pleated filter media.
 5. The soft hood of any one of Claims 1 to 4,
wherein the one or more outlet filter is configured to remove airborne particulates of a diameter of at least 0.1 µm, preferably at least 0.05 µm.
 6. The soft hood of any one of Claims 1 to 5,
wherein the one or more outlet filter comprises a HEPA filter media, and/or
wherein the one more outlet filter comprises a filter media made from polypropylene, polyester, glass fibre, or PTFE.
 7. The soft hood of any one of Claims 1 to 6,
wherein the one or more air filter comprises a filter media exhibiting at least 99.8% efficiency of aerosols of 0.05 µm in diameter, at a flow rate of 150L/min to 250L/min.
 8. The soft hood of any one of Claims 1 to 7,
wherein the one or more air outlet filters comprises a one-way filter media, arranged such that air is prevented from entering the soft hood via the one or more air inlet filters.
 9. The soft hood of any one of Claims 1 to 8,
wherein the air outlet filter comprises a housing and a filter media, the filter media being removably received within the housing, wherein the housing is preferably removably connectable to a shell or a visor of the soft hood.
 10. The soft hood of any one of Claims 1 to 9,
wherein the soft hood is configured to define an air chamber around a user's face, when in use, and wherein the soft hood has a deflated state, in which the air chamber is at atmospheric pressure, and an inflated state, in which the air chamber is at a pressure above atmospheric pressure, and
wherein the soft hood is transferrable between its deflated and inflated state by introducing forced air flow into the soft hood via the air inlet port.
 11. The soft hood of any one of Claims 1 to 10,
comprising a sealing arrangement configured to rest against a user's head and/or neck, when in use, the sealing arrangement preventing air from exiting the soft hood anywhere other than the air outlet filter.
 12. The soft hood of Claim 11,
wherein the sealing arrangement comprises:
 - an elastic sealing strip with a first part arranged to rest against a user's jaw when in use; and
 - a sealing cushion arranged along an inner surface of the first part of the elastic sealing strip, the sealing cushion comprising flaps protruding over the sealing strip in a longitudinal direction of the sealing strip,
 wherein the flaps are freely movable with respect to the elastic sealing strip.
 13. A PAPR comprising:
 - a soft hood according to any one of Claims 1 to 12;
 - an air blower unit for generation of forced air flow; and
 - an air supply hose or duct for supply of forced air flow from the air blower unit to the soft hood.
 14. The PAPR of Claim 13, comprising a control unit configured to:
 - receive pressure-data indicative of an air pressure within the soft hood; and
 - control the forced air flow generated by the air blower unit on the basis of the pressure-data.
 15. The PAPR of Claim 14, wherein the control unit is configured to:
 - set the forced air flow rate generated by the air blower to a default air flow rate;
 - determine on the basis of the pressure-data the pressure within the soft hood;
 - compare the pressure within the soft hood to a first pressure threshold; and
 - reduce the air flow generated by the air blower, if the pressure within the soft hood exceeds the

pressure threshold,

wherein the control unit is preferably configured to
alarm the user of the soft hood when the pressure
within the soft hood exceeds the first pressure 5
threshold.

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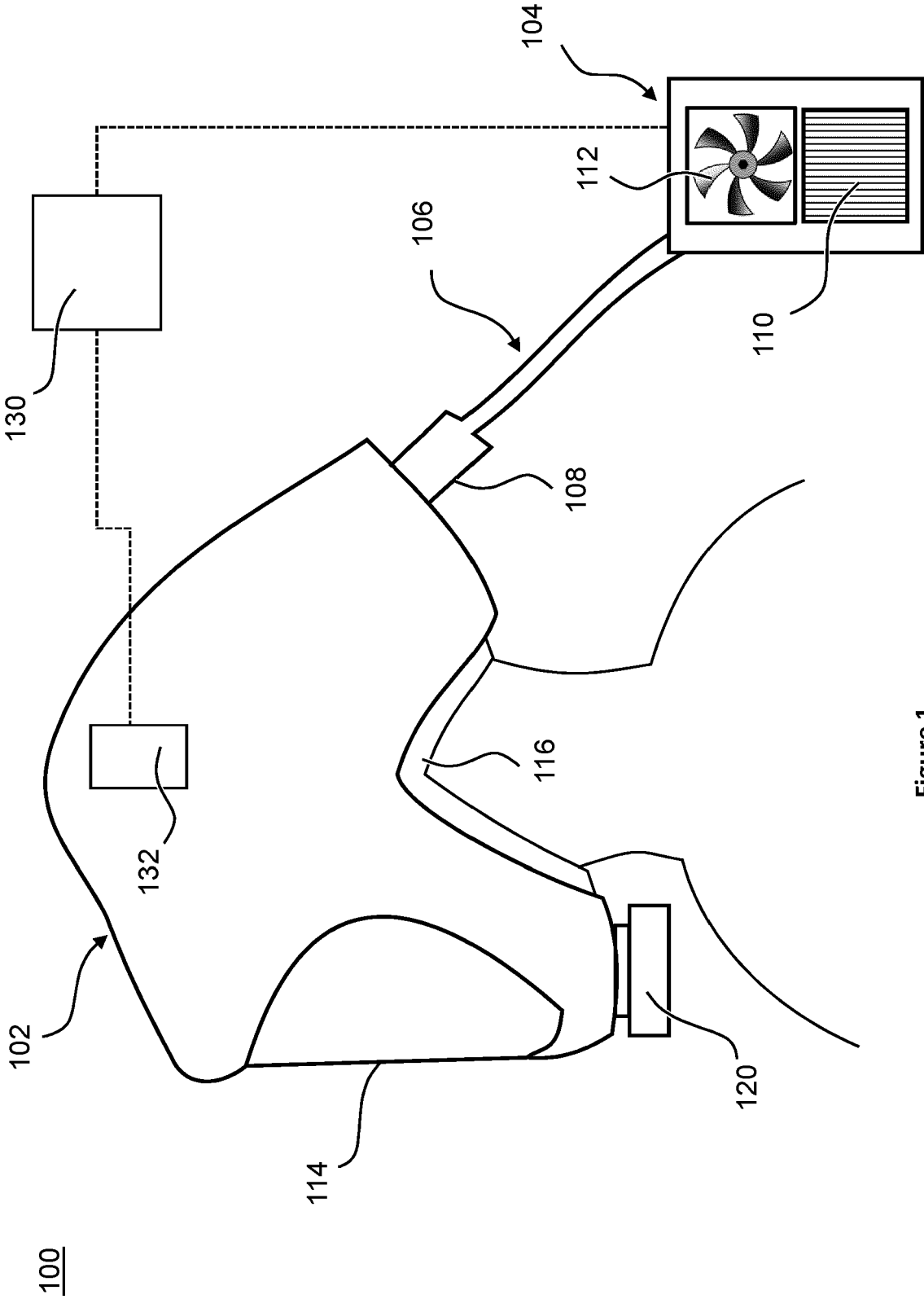


Figure 1

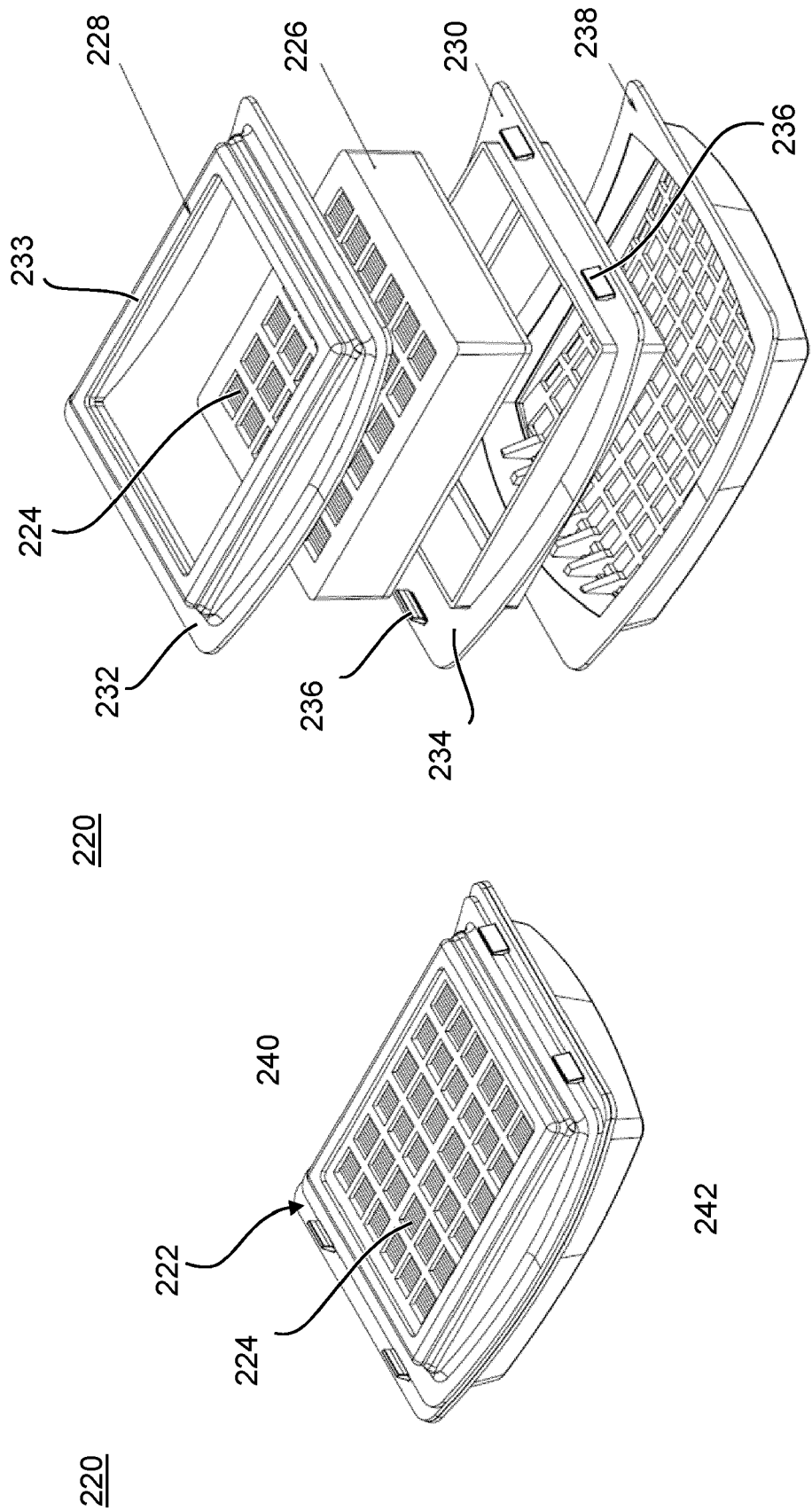


Figure 2B

Figure 2A

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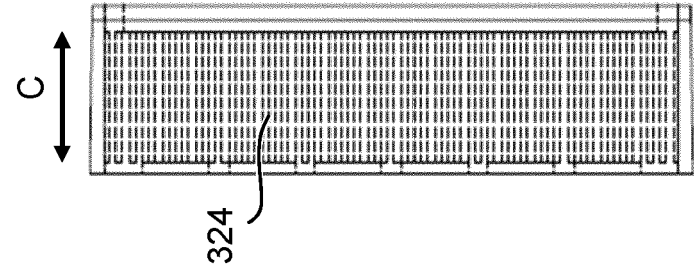


Figure 3B

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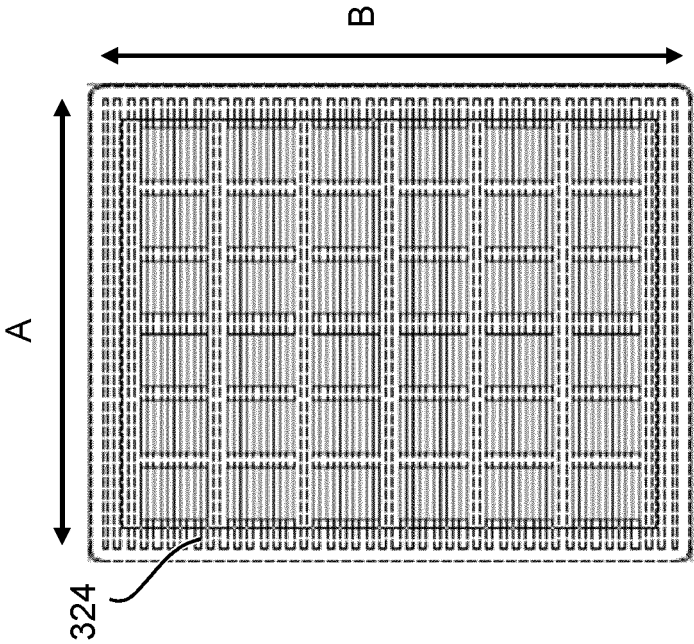


Figure 3A

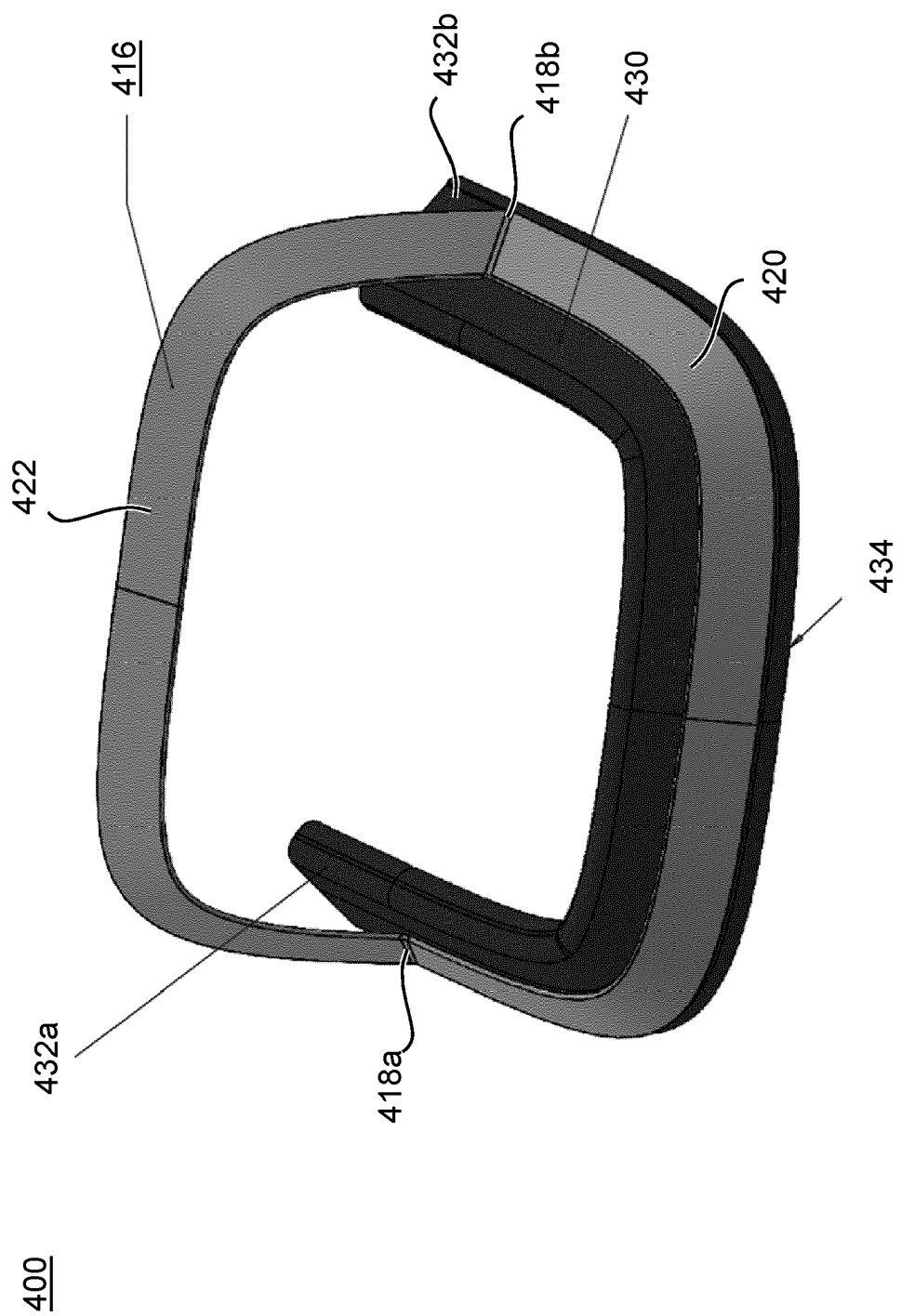


Figure 4



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Application Number

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T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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