Patent claims

1. A protective hood assembly, comprising a protective hood (1) which covers the user's head and shoulders made from flexible, pliable material and with a viewing window (3), a mounting structure (18) for the protective hood (1), an active air exchange system with a fan (6) with corresponding control assembly, a housing (5) for the fan (6) arranged within and separate from the protective hood (1), which is attached to the mounting structure (18) within the protective hood (1), and a filter (8) for the used air integrated in the protective hood (1), characterized by an air inlet opening allowing unimpeded flow-through and leading to the fan (6) in the protective hood (1), and by an inlet port (5b) emanating from the housing (5), routed in a sealed manner through the air inlet opening of the protective hood (1) on the outer side thereof, forming a releasable connection between the mounting structure (18) and the protective hood (1), wherein the air inlet opening and/or the inlet port (5b) is/are covered by a cleanroom fabric or filter fleece, preferably by an FFP2 protection class material, or by a breathing air filter (7) for fresh air placed on the inlet port (5b) on the outside of the protective hood (1) in front of the fan (6), or by a mesh cover (34), wherein the assembly further comprises a sensor unit (42), which emits at least one signal representing the user's breathing rate, an evaluation unit (41) with at least one input for the signal from the sensor unit (42) and an output for a control signal for the fan, a control unit (9) for the fan (6) with an input for the control signal from the evaluation unit (41), wherein the evaluation unit is configured so as to generate a control signal proportional to the breathing rate for the fan (6) such that the air quantity propelled by means of the fan (6) is proportional to the breathing rate.

2. The assembly according to Claim 1, characterized in that the housing (5) is arranged in the region between the crown and the front of the protective hood (1) and is preferably connected with the mounting structure (18) in this region.

3. The assembly according to Claim 1, characterized in that the inlet port (5b) passes through an upper section of the viewing window (3) covered by the protective hood (1) and that a breathing air filter (7) is preferably arranged above the visible area of the viewing window (3).

4. The assembly according to Claim 1, characterized in that the housing (5) of the fan (6) and the air inlet opening are arranged on the rear side of the protective hood (1), preferably at the level of the neck section of the protective hood (1), wherein a possible breathing air filter (7) is preferably also arranged on the rear side of the protective hood (1).

5. The assembly according to Claim 4, characterized in that a mounting frame (16) or an assembly with at least one carrying strap beneath the protective hood (1) is deployable and releasably connectable with the housing (5), or that the housing (5) is releasably connectable with the mounting structure (18).

6. The assembly according to Claim 1, characterized in that the mounting structure (18) and/or the housing (5) is/are mounted on a helmet (30) positioned within the protective hood (1).

7. The assembly according to Claim 1, characterized in that the drive of the fan (6) is integrated in the housing thereof and that preferably a self-sufficient power supply unit (15) can be coupled to the housing (5).

8. The assembly according to Claim 7, characterized in that the power supply unit (15) is positioned at a distance from the housing (5) on the inner side of the protective hood (1), preferably on a carrying strap or browband, and preferably on the rear side opposite the viewing window (3), and is connected with the drive and the control assembly for the fan (6) via a preferably flexible electricity and control line (23).

9. The assembly according to Claim 8, characterized in that the housing (5) has a receptacle for the self-sufficient power supply unit (15), preferably in the longitudinal central plane of the mounting structure (18), which can be directly coupled with the housing (5), preferably by way of insertion into the housing (5).

10. The assembly according to Claim 1, characterized in that at least a partial area of the protective hood (1) is made of a filter fleece (8), preferably an FFP2 filter fleece, which represents the filter for the used air, wherein the partial area is preferably arranged on the rear side

of the protective hood (1), or in that the entire protective hood (1) is made of a cleanroom fabric, preferably according to DIN EN ISO 14644-1, or a filter fleece, preferably an FFP2 filter material.

11. The assembly according to Claim 1, characterized in that the air quantity is in a range of between 40 l/min and 100 l/min.

12. The assembly according to Claim 1, characterized in that the sensor unit (42) has a pressure sensor (43) for the air within the protective hood (1).

13. The assembly according to Claim 1, characterized in that the sensor unit (42) has a CO2 sensor (44) and in that the evaluation unit is configured such that if a threshold value for the CO2 concentration within the protective hood (1) is exceeded, the fan (6) is sped up and/or a warning signal is generated.

14. The assembly according to Claim 1, characterized in that the evaluation unit (41) is configured such that the control signal for the fan (6) is only generated after a predeterminable number of shortened or extended breathing cycles.

15. The assembly according to Claim 1, characterized in that a safety algorithm is implemented in the unit which initiates at least a predeterminable action in the event of a non-detectable and/or absent pressure change, and in particular initiates a warning signal and/or switches the fan to a safety mode.

16. The assembly according to Claim 15, characterized in that in safety mode the fan (6) propels an air quantity of 80 l/min.

17. The assembly according to Claim 1, characterized in that the fan (6) is connected with a control assembly (10) which initiates operation of the fan (6) after placement of the breathing air filter (7) or the mesh cover (34) in the inlet port (5b), wherein the control assembly (10) is preferably integrated in the housing (5) of the fan (6).