

BALACLAVA FOR HEAD PROTECTION

The present invention relates to a head protection hood having an outer face provided to be in contact with a surrounding medium, an inner face provided in contact with a user's head, a head passage section and a facial opening at the user's eye level closed by a visor detachably fastened to the hood, said hood comprising an outer lining having an inner face and being open-worked across from said facial opening, said lining forming, with the outer face of the hood, a pocket in which said visor is removably slid, said hood further comprising at least one bearing element inserted between said outer face of the hood and said lining, said bearing element at least partially running alongside said facial opening.

Such hoods are known from the state of the art and are particularly used in aseptic and sterile environments where the user must be isolated from the surrounding medium. This is particularly indicated in environments such as clean rooms and laboratories where vaccines and medicines are prepared. On the one hand, in this type of environment, the user should be isolated as well as possible to avoid contaminating the environment in which he is working, and on the other hand, the user himself often needs to be isolated from hazardous and/or harmful substances.

When an operator must work in a sterile environment, he must in particular be careful not to contaminate the equipment it contains. Thus, the operator must comply with strict dress procedures, which are only meaningful if the protection equipment he uses itself is sterile. To that end, the uniforms and hoods are generally provided after sterilization in sealed packages, easy opening of which allows sterile equipment to be grasped. Furthermore, more particularly regarding hoods provided with a visor, the latter must not only be sterile, but must also be completely clean to ensure correct vision and working comfort for the user.

More particularly, document US2583304 describes a head protection hood as indicated in above and that is provided so that a removable visor is slid and positioned between a frame forming a bearing element (or support element) for the visor and the outer face of the hood. When the visor is placed, it is therefore inserted between the bearing element and the outer face of the hood.

Unfortunately, such an arrangement of the various elements of such a hood does not make its use comfortable for the user and does not make it possible to ensure correct and continuous vision through the visor when the latter is in direct

contact with the outer face of the hood and therefore very close to the operator's face (i.e., generally a distance of only several millimeters), which in particular causes mist or even condensation to form on the visor and does not allow corrective lenses to be worn. Correct vision is, however, crucial when the operator must handle hazardous substances, which is often the case when work is being done in laboratories or clean rooms. In fact, as mentioned above, such a hood known from the state of the art is subject to the formation of condensation on the visor and is difficult to wear without bother for an operator who wears corrective lenses.

Hoods also exist provided with a fixed visor, for example protective hood E5111101 marketed by Protexyl. Such a hood is provided with a fixed visor attached thereto to ensure the isolation and protection of the user, but also to minimize the risks of contamination of the surrounding environment (vaccines, medications, etc.) and by the surrounding environment. After they have been used, these hoods provided with a fixed visor must be sent to a cleaning and sterilization facility so that they can be reused. However, since these hoods are provided with a fixed visor, which is generally made from a transparent plastic material, they cannot undergo traditional sterilization, much less a series of sterilizations where the conditions are not compatible with the material forming the visor. The latter would deform and could even lose its transparency, for example under the effect of the heat or under the effect of specific radiation used during sterilization.

Furthermore, even if sterilization by the application of specific rays could make it possible to sterilize the hoods provided with the visor, the fact nevertheless remains that cleaning of the visor, and particularly cleaning of the face of the visor situated inside the hood, would remain problematic. In fact, in order to clean that face of the visor, it would be necessary to insert cleaning instruments inside the hood or to turn the latter over to expose the inner face of the visor to be cleaned. These operations would be restrictive and require many manipulations, which are costly in terms of handling and time.

Still another approach known from the state of the art consists of using hoods combined with protective goggles of the "ski mask" type (for example, like those described in document EP0195517). However, the use of protective goggles is also a recurring issue within industries. In fact, once they have been used or following a handling error in their placement, the protective goggles, like the hoods, must be cleaned and sterilized. While the cleaning and sterilization of clothing (uniform, hood,

etc.) are often entrusted to outside companies that next bring the equipment (uniform, hood, etc.) back in sterile packaging, the cleaning of protective goggles is commonly handled by the industrialist, which must therefore have specific and expensive equipment or use equipment that is part of the production chain, for example such as sterilizers, that option inevitably interfering with the output of a production chain.

Furthermore, the protective goggles, for example of the ski mask type, do not cover the entire face and are generally provided with elastic bands that are necessary to fasten them over the hood. Such goggles are not necessarily provided to withstand drastic sterilization and cleaning conditions.

Furthermore, the protective goggles making up individual and additional equipment, the operator must handle them carefully so as not to let them fall, in which case the protective goggles would need to be changed, since they would have been contaminated. This type of protection for the eyes is therefore restrictive, slows the dressing procedures and increases the risks of contamination, on the one hand due to the fall risk of the protective goggles, but also because they must be handled, which increases the risks of transferring contaminants from the operator to the protective goggles and then into the surrounding environment.

There is therefore a real need to find an alternative to the use of hoods provided with a fixed visor, the use of protective goggles (of the ski mask type) or the use of a hood as described in document US2583304 so that simpler, less expensive and faster cleaning and sterilization steps can be carried out, so that the steps for putting on protective equipment are less restrictive, faster and safer in order to minimize any risk of contamination, as well as to avoid any hindrance to correct vision through the visor (for example due to the presence of condensation) and eliminate any bother for the operator wearing the hood (for example, when the operator wears corrective lenses).

The invention aims to offset the drawbacks of the state of the art by providing a hood making it possible to simplify the cleaning and sterilization steps, eliminate the use of protective goggles and avoid any hindrance to correct vision through the visor while ensuring user comfort even if the latter wears corrective lenses. The purpose of this is to make the cleaning and sterilization steps less restrictive, less expensive, faster and easier, but also to guarantee working comfort for the user by always allowing him to see correctly through the visor without being bothered by it. Furthermore, the invention also aims to provide a hood associated with an eye

protection device, which, when placed, makes it possible to minimize the risks of contamination.

To resolve these problems, the invention provides a hood as indicated in the beginning, characterized in that said hood is inserted between said inner face of
5 said lining and said bearing element.

Such a hood according to the invention is particularly advantageous, since it has a visor that can be placed and removed easily. Furthermore, unlike the hoods known from the state of the art that already provide a removable visor, once the latter is inserted between the inner face of the lining and the bearing element according
10 to the invention, it is kept at a certain distance from the outer face of the hood and therefore from the operator's face, sealing relative to the outside environment being ensured by the pocket. This is particularly advantageous, since such an offset and positioning of the visor according to the invention makes it possible for it not to touch the operator's face and not to bother the latter. This also allows users wearing
15 corrective lenses to be able to use the hood according to the invention without being bothered by a visor pressing against the frame of the lenses. Furthermore, such a space that is naturally filled with air makes it possible to minimize the formation of condensation on the visor, which ensures that the operator always benefits from correct vision.

Unlike the current hoods provided with a fixed visor, the hood according to the present invention therefore makes it possible to have a visor that can be removed quickly and replaced easily, placement of the visor also ensuring isolation and correct protection of the user relative to environment. Furthermore, being able to use a detachable, i.e., removable, visor rather than protective goggles makes it possible to
20 eliminate all of the handling operations related to placing the protective goggles and minimizes the risks of contamination related to their use.

A hood according to the invention also makes it possible, relative to the current hoods provided with a visor, to greatly simplify the steps for cleaning and sterilization of the protective equipment. In fact, being able to remove the removable
30 visor from the hood quickly and easily ultimately makes it possible on the one hand to have a textile element formed by the hood, and on the other hand an element made from a plastic material (or any other appropriate material) formed by the visor. Consequently, it is possible to direct the hood without its visor to a traditional cleaning and/or sterilization (decontamination) processing facility while the visor can be sent, for

reuse, to an appropriate cleaning system that will not damage it. One alternative is simply to replace the used visor with a new, clean visor on the decontaminated hoods.

5 The head protection hood according to the invention comprises an outer lining that is open-worked across from said facial opening and forms, with the outer face of the hood, a pocket in which said visor is removably slid. The presence of such a pocket forming a "receiving area" makes it possible to insert a visor therein such that the latter is an integral part of the protection hood according to the invention. Surprisingly, in the context of the present invention, it has been determined that even if the visor is removable, it makes it possible to ensure correct isolation of the operator relative to the sterile environment. In fact, the lining makes it possible to form a space between its inner face and the outer face of the hood, that space being dimensioned such that it hugs the edges of the visor so that the latter is "blocked" therein over its entire perimeter and does not move during use of the hood, for example when the user tilts his head to the side.

15 Advantageously, according to the invention, said bearing element is a seam made from the material (textile or other) forming the hood. That seam may include a filler material, for example such as a plastic foam. That bearing element, aside from forming a guide element during the insertion of the visor in the pocket formed by the lining, also forms a damping layer against which the operator's forehead presses, which guarantees him a certain level of comfort during his work. Furthermore, it is provided, according to the invention, that if the bearing element is placed at the lower part of the facial opening, the filler material is present in two parts, so as to leave a central area free of filler material, which defines a free space in which the operator can place his nose, each of the parts of the filler material bearing on one of the surfaces of the operator's nose.

20 Preferably, according to the invention, said pocket formed between the outer face of the hood and said lining has at least one closing means. The presence of a closing means makes it possible, following the insertion of the visor into said pocket, to close that pocket so as to temporarily block the visor therein so that it stays in place during the use of the hood. This closing for example prevents the visor from becoming offset or sliding toward the outside of the pocket, which would compromise the user's isolation relative to the environment and the sterility thereof. According to one embodiment, when the opening of the pocket is situated longitudinally at the operator's

forehead, such a closing means is not essential (although it may be present) as long as the visor is laterally blocked, as well as blocked along its lower part.

Advantageously, according to the invention, said at least one closing means is chosen from the group consisting of a pull tab, a snap fastener closure, a pushbutton closure, or self-gripping means, for example such as Velcro®. It is of course understood that any other appropriate closing means may be used in the context of the present invention.

Preferably, according to the invention, said visor is made from a transparent plastic material or any other appropriate material, for example Plexiglas®. This material may for example be rigid or flexible, tinted or not, scratch resistant or not, acid resistant or not, depending on the field of application. It is of course understood that the visor according to the invention may have many other properties.

Preferably, said visor has, at its lower part, a cutout corresponding to the area where the user's nose will be positioned in order to prevent a plastic edge from resting there, which would be particularly uncomfortable.

Advantageously, the head protection hood according to the invention comprises a self-adjusting system for the size of the hood placed at the back of the hood, for example snap fasteners making it possible to adjust the width of the hood and/or the height of the hood. By choosing to fasten a snap fastener on one fastening point rather than another, it is possible to define a good size adapted to the user's morphology such that the hood correctly hugs the operator's hood and is positioned so as not to bother the operator. Other self-adjusting systems, for example links or straps, may also make it possible to adjust the hood to the operator's morphology. Consequently, a hood according to the invention may be suitable for several users, who can adapt its size. It is understood that any other appropriate self-adjusting means may be used in the context of the present invention.

Preferably, the head protection hood according to the invention is an integral part of protective clothing for a clean room and similar facilities. In fact, the hood according to the invention may also form a single piece or be an integral part of protective clothing, for example a complete protective uniform, a smock or a jacket. It is understood that the hood may be connected to the protective clothing using any appropriate fastening means, for example by being sewn thereto or fastened thereto using a pull tab, snap fasteners or Velcro®.

Preferably, the hood according to the invention is an integral part of protective clothing that is a uniform as disclosed in document EP2303044, that uniform comprising an outer face provided to be in contact with a surrounding environment and an inner face arranged in contact with a handler, a first and second leg section
5 connected to each other by an opening in a crotch area, a first and second sleeve and a body part to which the first and second sleeves are connected by a connected end and the first and second leg sections also by a connected end, said body part comprising a head passage section, said uniform further comprising at least one gripping area in contact with the inner face in the body part.

10 Said at least one gripping area of such a uniform may for example be a slip-proof substance, an elastic, a tab, a cord, or may be formed by an area of the fabric (which does not need to be formally delimited) of the uniform, that area being arranged to be grabbed and grasped.

Advantageously, the head protection hood according to the invention is an
15 integral part of protective clothing that is a uniform whereof the opening is situated in the body part, for example the center of the chest or from the shoulder to the hip of an operator.

Other embodiments of the hood according to the invention are indicated in the appended claims.

20 Other features, details and advantages of the invention will emerge from the description thereof provided below, non-limitingly and in reference to the appended drawings.

Figure 1 is a front view of a head protection hood according to the invention.

25 Figure 2 is a detailed cross-sectional view along axis II of head protection hood according to the invention.

Figure 3 is another detailed cross-sectional view along axis III of a head protection hood according to the invention.

Figures 4a, 4b and 4c illustrate a hood according to the invention that is
30 connected to and an integral part of protective clothing.

In the figures, identical or similar elements bear the same references.

Figure 1 illustrates a hood 1 according to the invention, which has an outer face 2 provided in contact with the surrounding environment, an inner face 3 provided in contact with a user's head, a head passage section 4 and a facial opening 5

at the user's eye level. The facial opening 5 is closed by a visor 6 detachably fastened to the hood 1.

In the illustrated example embodiment, the hood 1 is provided with an openwork outer lining 7 whereof the window 7' (opening) is situated across from the facial opening 5 at the user's eye level. This lining 7 forms, with the outer face 2 of the hood 1, a pocket 8 in which the visor 6 can be slid removably. The pocket 8 further has a side opening 9 provided with closing means 10, for example a closure in the form of a pull tab. These closing means 10 make it possible to keep the visor 6 in the pocket 8 when the user is working and inevitably moves his head.

As illustrated, the pocket 8 frames the removable visor 6 over its entire perimeter, which makes it possible to block and maintain the latter in the space delimited by the pocket 8. Such framing of the visor 6, over its entire perimeter, makes it possible to isolate the operator from the surrounding medium in order to avoid any contamination thereof.

Optionally, the hood 1 may have one or more areas formed by a material different from that of the outer face of the hood 1, for example a permeable material. Such areas may be situated below and/or above the facial opening 5 in order to allow the operator to breathe easily, but also in order to aerate the inside of the hood 1.

Figure 2 is a cross-sectional view along axis II and illustrates one embodiment according to the invention. Bearing elements 11 are present and are inserted between the outer face 2 of the hood 1 and the openwork outer lining 7, the window 7' (opening) of which is situated across from the facial opening 5 at the user's eye level. These additional bearing elements 11 run alongside the facial opening 5 and are placed such that they are for example in contact with the operator's forehead and/or nose. Preferably, these bearing elements 11 are made from a soft material, for example plastic foam, to ensure user comfort.

According to one preferred embodiment, the bearing elements 13 are seams formed in the material making up the hood 1, said seams being filled by the soft material.

Preferably, the visor 6 is split between the bearing elements 11 and the inner wall of the lining 7, which makes it possible to keep the visor 6 at a certain distance from the operator's face. This is particularly indicated when the user wears corrective lenses.

Figure 3 is a cross-section along axis III and illustrates the pocket 8, which is provided with a side opening 9 by which a visor 6 can be slid so that it is "blocked" in said pocket 8. The pocket 8, provided with a side opening 9, therefore allows the placement then, after use of the hood, quick and easy removal of the visor 6. This ultimately makes it possible to have two separate elements, the visor 6 on the one hand, and the hood 1 on the other hand, those elements then each being able to be sent separately to an appropriate cleaning and/or sterilization station.

Figures 4a, 4b and 4c illustrate a hood 1 that is connected to and an integral part of protective clothing 12, in this case, for the example, a uniform for clean rooms (figures 4a and 4b) and similar (smock or jacket in figure 4c). It is understood that the hood 1 can be connected to the protective clothing 12 by any appropriate fastening means, for example by being sewn thereto or fastened thereto using a pull tab, snap fasteners or Velcro®. According to the invention, it is also provided that the head passage section 4 is at least partially covered by the protective clothing so as to be inserted at least partially into the protective clothing. As illustrated in figures 4a to c, the uniforms to which a hood according to the invention may be connected can comprise a closing system, for example a pull tab, at the crotch area, on the chest area or starting from the shoulder and going to the hip of the uniform.

It is understood that the present invention is in no way limited to the embodiments described above and that modifications may be made thereto without going beyond the scope of the appended claims.

CLAIMS

1. A head protection hood (1) having an outer face (2) provided to be in contact with a surrounding medium, an inner face (3) provided in contact with a user's head, a head passage section (4) and a facial opening (5) at the user's eye level closed by a visor (6) detachably fastened to the hood (1), said hood (1) comprising an outer lining (7) having an inner face and being open-worked across from said facial opening (5), said lining (7) forming, with the outer face (2) of the hood (1), a pocket (8) in which said visor (6) is removably slid, said hood (1) further comprising at least one bearing element (11) inserted between said outer face (2) of the hood (1) and said lining (7), said bearing element (11) at least partially running alongside said facial opening (5), characterized in that said visor (6) is inserted between said inner face of said lining (7) and said bearing element (11).
2. The head protection hood (1) according to claim 1, characterized in that said bearing element (11) is a seam including a filler material such as a plastic foam.
3. The head protection hood (1) according to claim 1 or 2, characterized in that said pocket (8) formed between the outer face (2) of the hood (1) and said lining (7) has at least one closing means (10).
4. The head protection hood (1) according to claim 3, characterized in that said at least one closing means (10) is chosen from the group consisting of a pull tab, a snap fastener closure, a pushbutton closure, or self-gripping means.
5. The head protection hood (1) according to any one of claims 1 to 4, characterized in that said visor (6) is made from a transparent plastic material.
6. The head protection hood (1) according to any one of claims 1 to 5, characterized in that said visor (6) has, at its lower part, a cutout corresponding to the area where the user's nose will be positioned.

7. The head protection hood (1) according to any one of claims 1 to 6, characterized in that it comprises a self-adjusting system for the size of the hood placed at the back of the hood.

5 8. The head protection hood (1) according to any one of claims 1 to 7, characterized in that it is an integral part of protective clothing for a clean room and similar facilities.

10 9. The head protection hood (1) according to claim 8, characterized in that it is an integral part of protective clothing that is a uniform comprising an outer face provided to be in contact with a surrounding environment and an inner face arranged in contact with a handler, a first and second leg section connected to each other by an opening in a crotch area, a first and second sleeve and a body part to which the first and second sleeves are connected by a connected end and the first
15 and second leg sections also by a connected end, said body part comprising a head passage section, said uniform further comprising at least one gripping area in contact with the inner face in the body part.

20 10. The head protection hood (1) according to claim 8, characterized in that it is an integral part of protective clothing that is a uniform whereof the opening is situated in the body part, for example the center of the chest or from the shoulder to the hip of an operator.