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(54) **Filter mask**

(57) A filter mask 1 is comprised of a head unit 3 which is present on the head of the user during use, and a face unit 5 which is provided with a face screen 7 protecting the face during use. The head unit is provided with first coupling means 29 which cooperate with second coupling means 31 fitted to the face unit and which first coupling means detachably couple the face unit to the head unit.

The head unit comprises a housing 9 as well as an air filter system accommodated therein. The housing is provided with an air intake opening and an air exhaust opening. The exhaust opening is located near the face screen. The housing is elongated and box-shaped and has a longitudinally curved bottom 15 which extends along an arc at an angle of at least 90 degrees.

The head unit does not include any other parts than the housing with the air filter system located therein and the coupling means connected thereto.

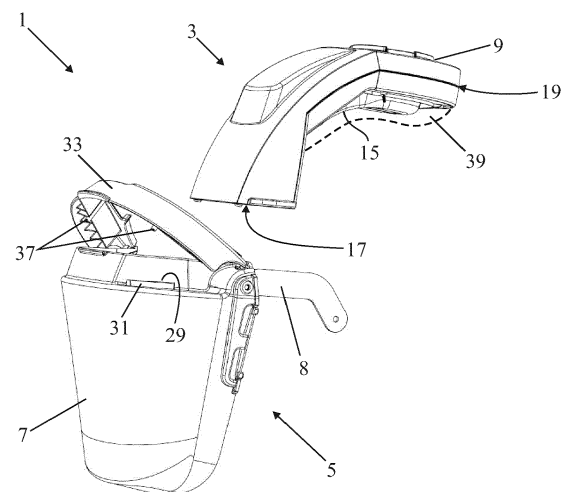


FIG. 3

Description

Field of the invention

[0001] The invention relates to a filter mask comprising a head unit which is present on the head of the user during use, and a face unit which is provided with a face screen protecting the face during use, the head unit being provided with first coupling means which cooperate with second coupling means which form part of the face unit and detachably couple the face unit to the head unit, the head unit comprising a housing as well as a fan accommodated therein, the housing being provided with an air intake opening and an air exhaust opening, the exhaust opening being present near the face screen and the filter mask further including a head strap by which the filter mask can be fastened to the head of a user.

State of the art

[0002] A filter mask of this type is known from EP 2316289 A. With this known filter mask the head unit is formed by a helmet which accommodates the fan and the face screen of the face unit is detachably connected to the helmet as a result of which this face screen can be exchanged with another face screen. The head strap in this known filter mask is connected to the head unit. The known filter mask further includes a battery which is connected to the fan and is worn on the user's body.

Summary of the invention

[0003] It is an object of the invention to provide a filter mask of the type defined in the opening paragraph, which can be easily put away and taken along and, in addition, is comfortable in wearing. For this purpose the filter mask according to the invention is characterized in that the housing further accommodates a filter which is located between the intake opening and the fan, as well as a battery connected to the fan. Since all components of the filter system are accommodated in the housing, the head unit can be easily put away and taken along.

[0004] An embodiment of the filter mask according to the invention is characterized in that the housing is elongated and box-shaped and has a longitudinally curved bottom, where the exhaust opening is located near a first end of the housing, and in that the head strap is connected to the face unit. This form of housing provides a compact head unit. In addition, the filter mask according to the invention has an extraordinarily open structure as a result of which the user of the filter mask experiences a minimum of cumbersomeness and inconvenience from the filter mask.

[0005] The filter is preferably disc-shaped and runs parallel to a tangent plane to the user's head. This contributes to a compact construction of the head unit.

[0006] A further embodiment of the filter mask according to the invention is characterized in that the head strap

comprises two first parts which are fitted to the left and the right side of the face unit, as well as two second parts which are each hingedly connected with a first end to the first parts and with the second ends are adjustably connected to each other. By turning the second parts of the head strap upwards, the filter mask can be applied over the head of a user. Subsequent to this, the second parts can be turned downwards as far as behind the back of the head of the user. In consequence, it is not necessary for the face screen to be hingedly connected to the rest of the face unit to be able to apply the filter mask over the user's head.

[0007] A still further embodiment of the filter mask according to the invention is characterized in that the housing extends along an arc at an angle of at least 90 degrees. As a result, a large part of the weight of the head unit rests on the user's head and the head strap needs to absorb less weight, so that it needs to be fitted to the head in a less tight manner.

[0008] The head unit preferably does not include any further components than the housing with the filter accommodated therein and the accommodated fan and battery as well as the coupling means connected to the head unit.

[0009] For improving the wearing comfort, an embodiment of the filter mask according to the invention is characterized in that the head unit is provided with a mask pad which is fitted to an under side of the bottom and is present at least near the other, second end of the housing. The mask pad preferably completely extends to near the first end of the housing.

[0010] An advantageous embodiment of the filter mask according to the invention is characterized in that one of the first and second coupling means comprises at least a single protrusion and the other one of the first and second coupling means comprises a recess into which the protrusion can be inserted, where one of the first and second coupling means further includes a locking element that locks the protrusion in the recess.

[0011] The locking element is preferably formed by a bracket which with both ends is rotatably connected to the head unit or the face unit and in that either the bracket or the protrusion is provided with a further protrusion while the other element is provided with a further recess in which the further protrusion is locked.

Brief description of the drawings

[0012] The invention will now be described in more detail below based on an embodiment of the filter mask according to the invention represented in the drawings. Herein:

Fig. 1 shows a perspective view of an embodiment of the filter mask;
Fig. 2 shows the filter mask with open bracket;
Fig. 3 shows the filter mask with head unit and face unit detached from each other;

Fig. 4 shows a plan view of the head unit; and
Fig. 5 shows a sectional view of the head unit.

Detailed description of the drawings

[0013] Fig. 1 shows a perspective view of the filter mask according to the invention. The filter mask 1 is comprised of a head unit 3 which is present on the head of the user during use, and a face unit 5 which is comprised of a face screen 7 which protects the face during use. The filter mask further includes a head strap which is connected to the face unit. This head strap comprises two first parts 8 which are fitted to the face screen, and two second parts 10 which are hingedly connected to the face screen and form a strap that is applied to the back of the head of the user during use. The length of this strap can be adjusted by means of the turning knob 12 which allows the two second parts to overlap more or less. Fig. 1 shows this strap in the position which is adopted during the wearing of the filter mask and Fig. 2 shows the strap in the position in which the filter mask can be applied to the user's head. The head unit comprises a housing 9 which accommodates an air filter system. The housing is provided with an air intake opening 11 (see Fig. 5) and an air exhaust opening 13. The air exhaust opening is located near the face screen 7.

[0014] The housing 9 is elongated and box-shaped and has a bottom 15 curved in longitudinal direction that extends along an arc at an angle of at least 90 degrees. The air exhaust opening 13 is located near a first end 17 of the housing and the air intake opening 11 is located near a second end 19 of the housing.

[0015] The air filter system is comprised of a filter 21 which is located near the second end 19 of the housing 9, a fan (25) connected to this filter via a channel 23 and a battery 27 connected to this fan.

[0016] The head unit 3 is comprised of first coupling means which are formed by two protrusions 29 (see Figs. 3 and 4). The face unit 5 is comprised of second coupling means which are formed by two recesses 31 (see Figs. 2 and 3) and a locking element which is formed by a bracket 33 which with the two ends is rotatably connected to the face screen 7. The head unit 3 is coupled to the face unit 5 in that the protrusions 29 of the face unit are inserted into the recesses 31, after which the bracket 33 is closed. The protrusions 29 are provided with further recesses 35 (see Fig. 4) and the bracket 33 is provided with further protrusions 37 which, in a closed state of the bracket fit in the further recesses 33 in the protrusions 29 and thus lock the head unit relative to the face unit.

[0017] The head unit 3 may be provided with a mask pad 39 which is fitted to the under side 15 of the bottom and extends from the second end 19 to near the first end 17 of the housing.

[0018] Albeit the invention has been described in the foregoing with reference to the drawings, it should be observed that the invention is not by any manner or means restricted to the embodiments shown in the draw-

ings. The invention also extends to all embodiments deviating from the embodiments shown in the drawings within the scope defined by the claims.

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Claims

1. A filter mask (1) comprising a head unit (3) which is present on the head of the user during use and a face unit (5) which is provided with a face screen (7) protecting the face during use, the head unit being provided with first coupling means which cooperate with second coupling means which form part of the face unit and detachably couple the face unit to the head unit, the head unit comprising a housing (9) as well as a fan (25) accommodated therein, the housing being provided with an air intake opening (11) and an air exhaust opening (13), the exhaust opening being present near the face screen and the filter mask further including a head strap (8) by which the filter mask can be fastened to the head of a user, **characterized in that** the housing (9) further accommodates a filter (21) which is located between the intake opening (11) and the fan (25), as well as a battery (27) connected to the fan.
2. A filter mask (1) as claimed in claim 1, **characterized in that** the housing (9) is elongated and box-shaped and has a longitudinally curved bottom (15), where the exhaust opening (13) is located near a first end (17) of the housing, and **in that** the head strap (8) is connected to the face unit (5).
3. A filter mask (1) as claimed in claim 1 or 2, **characterized in that** the filter (21) is disc-shaped and runs parallel to a tangent plane to the user's head.
4. A filter mask (1) as claimed in claim 1, 2 or 3, **characterized in that** the head strap comprises two first parts (8) which are fitted to the left and the right side of the face unit (5), as well as two second parts (10) which are each hingedly connected with a first end to the first parts and with the second ends are adjustably connected to each other.
5. A filter mask (1) as claimed in any one of the preceding claims, **characterized in that** the housing (9) extends along an arc at an angle of at least 90 degrees.
6. A filter mask (1) as claimed in any one of the preceding claims, **characterized in that** the head unit (3) does not include any further components than the housing (9) with the filter (21) accommodated therein and the accommodated fan (25) and battery (27) as well as the coupling means connected to the head unit.

7. A filter mask (1) as claimed in any one of the preceding claims, **characterized in that** the head unit (3) is provided with a mask pad (39) which is fitted to an under side of the bottom (15) and is present at least near the other, second end (19) of the housing (9). 5
8. A filter mask (1) as claimed in claim 7, **characterized in that** the mask pad (39) extends to near the first end (17) of the housing (9). 10
9. A filter mask (1) as claimed in any one of the preceding claims, **characterized in that** one of the first and second coupling means comprises at least a single protrusion (29) and the other one of the first and second coupling means comprises a recess (31) into which the protrusion is inserted, where one of the first and second coupling means further includes a locking element that locks the protrusion in the recess. 15 20
10. A filter mask (1) as claimed in claim 9, **characterized in that** the locking element is formed by a bracket (33) which with both ends is rotatably connected to the head unit (3) or the face unit (5) and **in that** either the bracket (33) or the protrusion (29) is provided with a further protrusion (37) while the other element is provided with a further recess (35) in which the further protrusion is locked. 25 30

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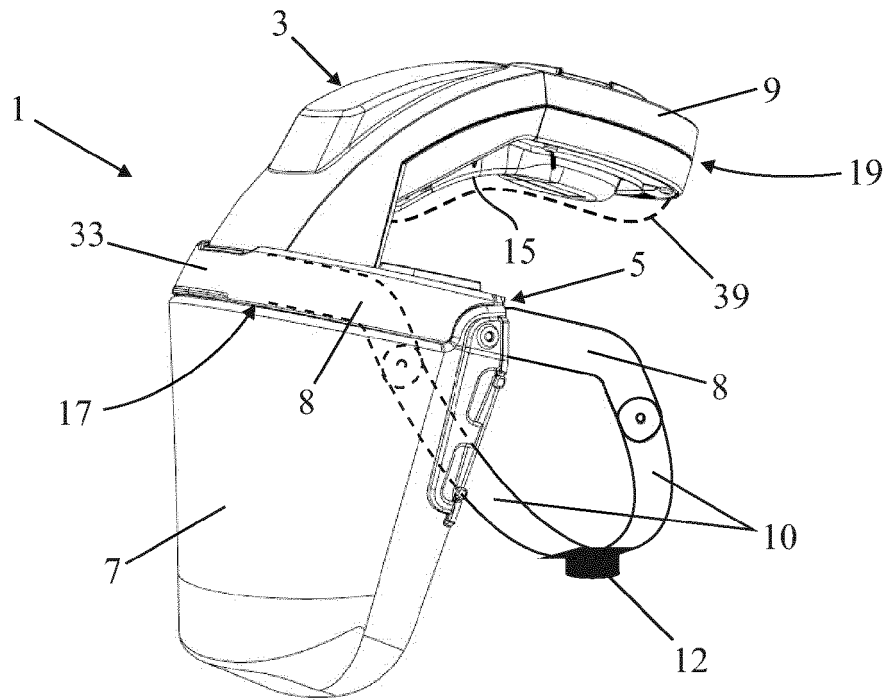


FIG. 1

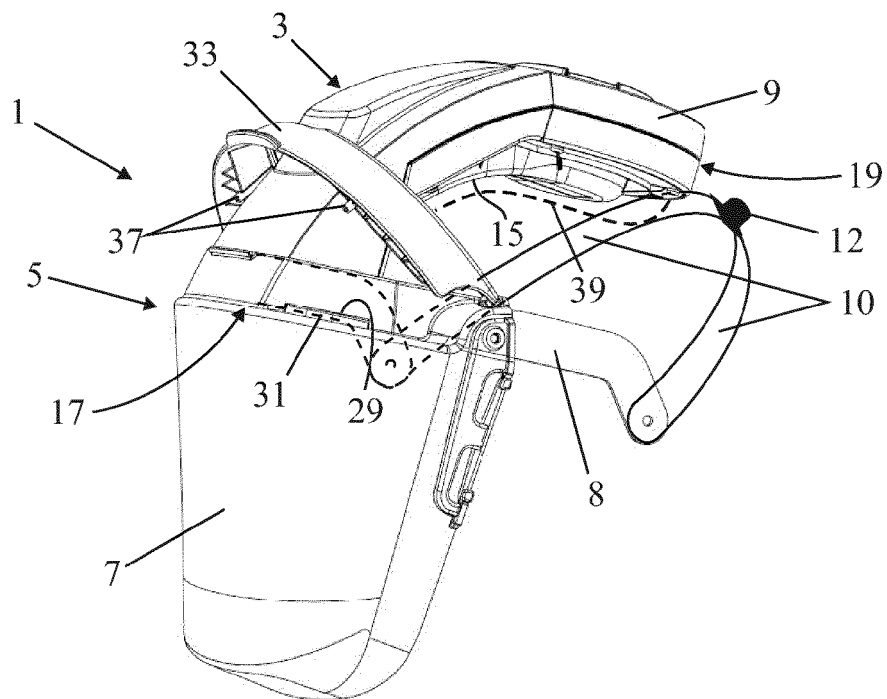


FIG. 2

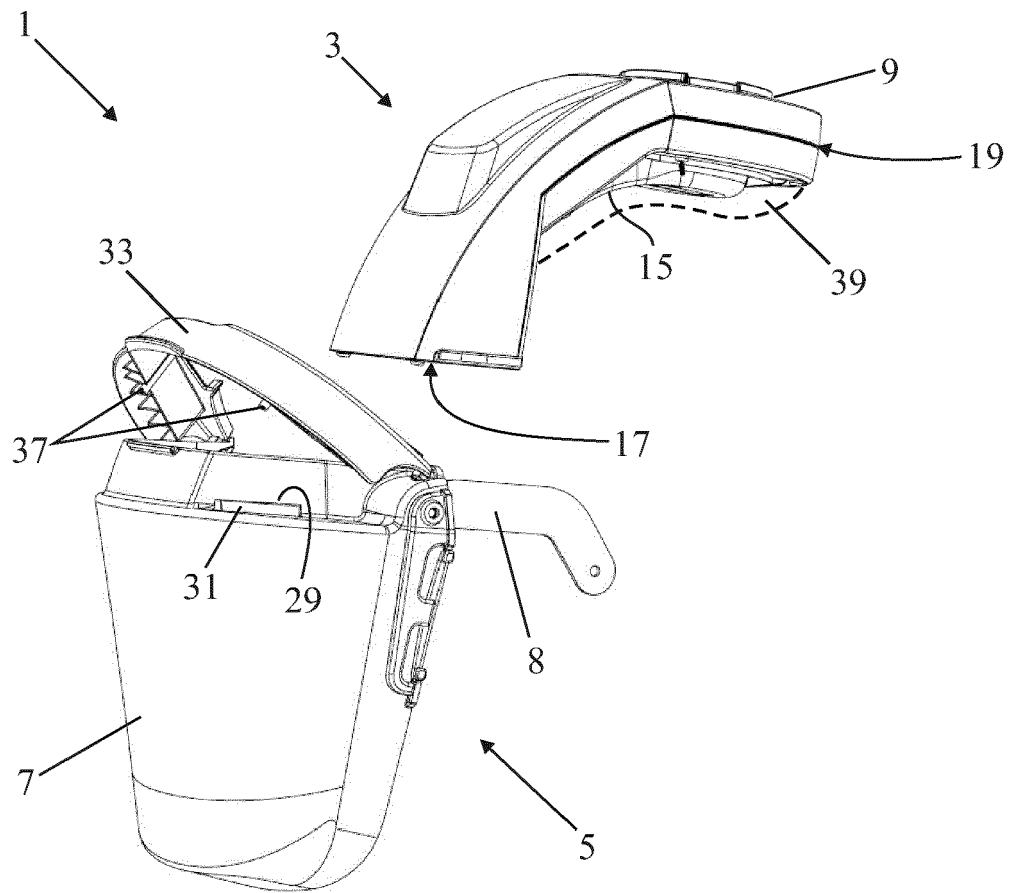


FIG. 3

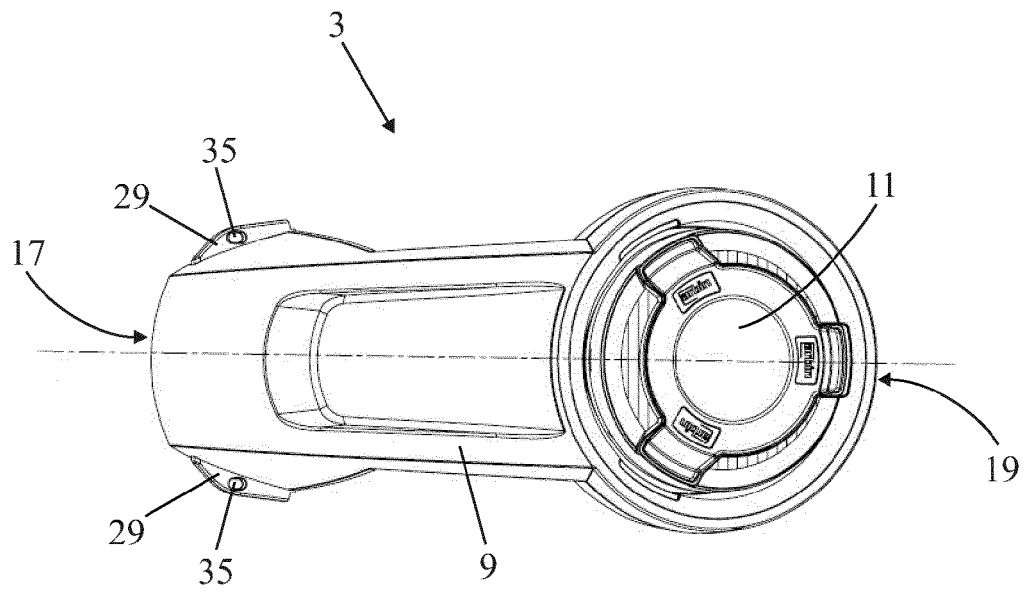


FIG. 4

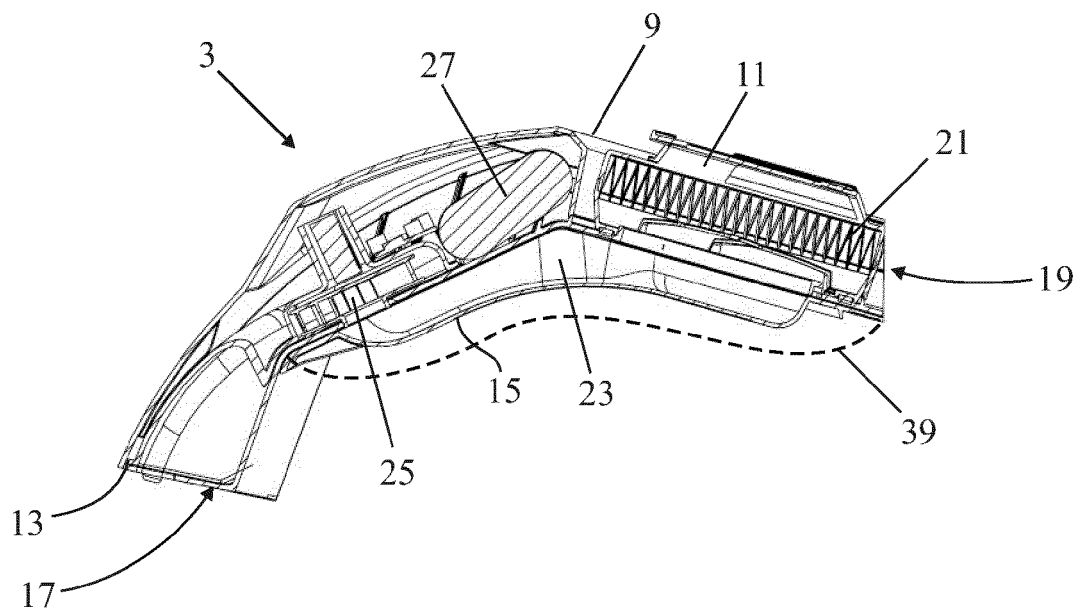


FIG. 5



EUROPEAN SEARCH REPORT

Application Number
EP 14 18 8360

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Place of search The Hague		Date of completion of the search 24 February 2015	Examiner D'Souza, Jennifer
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