

12

EUROPEAN PATENT APPLICATION

21 Application number: 84304220.1

51 Int. Cl.⁴: **A 62 B 17/04**

22 Date of filing: 22.06.84

30 Priority: 22.06.83 GB 8316947

43 Date of publication of application:
02.01.85 Bulletin 85/1

84 Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

71 Applicant: **U.K. Asbestos Plant & Machinery Limited**
Victoria Works Woodhead Road
Holmfirth Nr. Huddersfield, HD7 1PR(GB)

72 Inventor: **Pitman, James**
Victoria Works Woodhead Road
Holmfirth Huddersfield, HD7 1PR(GB)

74 Representative: **Denmark, James**
c/o Bailey Walsh & Co. 5 York Place
Leeds LS1 2SD Yorkshire(GB)

54 Improvements relating to face masks.

57 The invention provides a face cover for application over at least the mouth, and provided with a strap which holds the cover sealed to the face, the said strap being inflatable so as to form a seal to the head limiting or preventing ingress of atmospheric air to the region of the mouth.

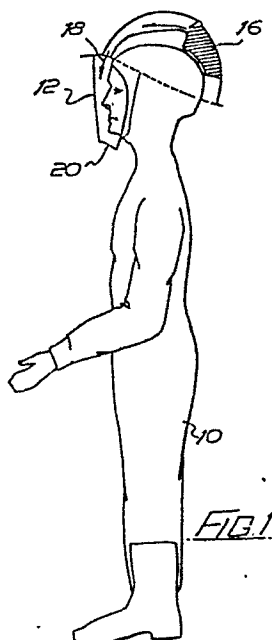


FIG. 1

Improvements Relating to Face Masks

05 This invention relates to face masks, and in particular concerns a mask for utilisation by an operator who is working in an environment containing airborne particles, inhaling of which can constitute a hazard to health.

10 We are concerned specifically with the provision of a face mask for an operator who is working in an environment in which there are airborne particles and fibres of asbestos dust. Such environments are more common than one might appreciate, because currently, due to the fact that the health hazard of asbestos has
15 now been well identified, many asbestos surfaces, linings, claddings, ceilings and the like are being removed from buildings and other areas in which the people are located. Asbestos sheets, linings and coatings are difficult to remove, and the known
20 equipment for removing asbestos operates by disintegrating the asbestos layers into particulate form, and by sucking away the airborne particles. Operators who work in such conditions must of course be protected with appropriate masks to prevent inhaling of
25 the health hazard particles.

A known operator mask for working in such an environment comprises a helmet in which is housed a fan and filter. The fan draws air from the surrounding
30 atmosphere through a filter which removes the particulate material, and the filtered air is then blown downwards over the operator's face and mouth so that he will inhale only filtered air. This construction has been shown to be inefficient in that it
35 is still possible, for example when the operator takes a large gulp of air, for him to inhale airborne particles, by drawing up air from the underside of the

helmet in the region of his mouth. It has been proposed that the operator should be provided with a small mouth mask in addition to the helmet, but such mask simply is located over the mouth and basically
05 comprises a filter swab of a fibrous material. If the operator inhales deeply with such a mouth mask, the tendency is for the air in the swab to be withdrawn quickly, and for the swab to compress onto the face and the cheeks pulled into pressure contact with the swab.
10 Furthermore, such a mouth mask does not effectively prevent the inhaling of airborne particles carried by air which flows upwardly past the chin.

The present invention aims to provide a face mask which
15 is free from the disadvantage of using a fibrous mouth mask, and in accordance with the present invention, there is provided a face mask comprising a cover for overlying the mouth and a head band for wrapping around the head, said head band being inflatable for sealing
20 against the head to prevent or limit the flow of atmospheric air to the region of the mouth.

The face cover may be provided with a second band for wrapping round the head at a higher level so that the
25 face cover covers substantially all of the frontal area of the face.

By using an inflatable strap to wrap round the head and chin, a seal can be made against the face and head, and
30 also movement of the chin in normal jaw movements will not dislodge the strap or create air passages through which airborne particles can be drawn.

Such a face mask may be used in conjunction with a
35 helmet embodying a fan and air filter as described, for the effective protection of an operator.

One embodiment of the present invention is illustrated in the accompanying diagrammatic drawings, wherein:-

05 Fig. 1 shows a human figure with a helmet embodying a fan and air filter;

Fig. 2 shows a human head with a mask according to the invention fitted thereto; and

10 Fig. 3 is a sectional elevation taken through one of the head bands of the mask illustrated in Fig. 2.

Referring to the drawings, assuming that the person 10 illustrated in Fig. 1 is working in an environment in
15 which the atmosphere carries dust particles and fibres, such as asbestos fibres and particles, which constitute a hazard if inhaled. The figure is shown as provided with a helmet 12 including a filter and fan arrangement 16 located inside the helmet 12 and towards
20 the rear thereof. The filter and fan unit 16 serves to draw air from the atmosphere through the filter unit 16 to remove particles therefrom, and to blow filtered air down across the persons' face as shown by arrow 18 so that only filtered air will be inhaled. This
25 arrangement is not satisfactory, because if the person inhales deeply and quickly, airborne particles can still be drawn in through the open lower front end 20 of the helmet.

30 To give added protection to prevent this happening, a mask 22 as shown in Fig. 2 and which is according to the invention, is provided, the said mask 22 comprising a face cover 24 of an impermeable and transparent nature, such as a plastics material film or the like.
35 The face cover may be flexible or rigid and preferably will be of such a size as to hold a pocket of relatively still air over the users' mouth and

preferably the majority of his face. The face cover 24 is held sealed against the face by means of upper 26 and lower 28 straps, of which at least the lower strap, according to the invention, is flexible and inflatable so that when inflated it will be sealed against the users' face and head. The strap 28 has a valve 29 for the inflation of same by a pump or the like and by which the strap can be deflated at will. It is intended that the lower strap 28 should fit across the users' chin under the mouth, and the flexibility of the strap 28 will enable the user to move his chin in normal jaw movements without breaking the seal between the inflated strap and the users' head.

The upper strap may be of a similar construction, or may be simply an elasticated member.

The inflated strap preferably is constructed of a flexible plastics material which is stronger towards the outside in the region 30 shown in Fig. 3, and more flexible towards the inside, being the side which contacts the users head, so that such inner side 32 will expand more when the strap is inflated, thereby formed an effective seal against the users head. This can be achieved as shown by making the wall of the strap at side 32 thinner than the other side 30, or by other means.

When used in conjunction with the helmet as shown in Fig. 1, the face mask according to the invention provides an extremely effective barrier for unwanted inhaling of airborne particles; and it is possible to provide for the flow of air from the helmet to be into the face mask 24 so that fresh air will be present in the region of the users' mouth.

The face mask may be constructed of any suitable

materials, consistent with the achievement of the objectives of the invention. The face cover may cover substantially all of the frontal area of the face, thereby providing a substantial pocket of still air in front of the users' face, which can be inhaled quickly, without causing the face cover to collapse completely on the users' face.

The invention may have wider application. For example, it is possible to conceive a face mask which forms part of a more rigid structure such as a helmet, and the inflatable portion being the beading of the helmet or an inflatable portion on the edge of the helmet performing a seal against the users' head. In an alternative construction, the mask may be in the nature of a flexible hood which can be applied over the users' head and with the region which can be sealed to the users' head by inflation of a portion thereof.

Whilst the appended claims seek to define the present invention as envisaged by the applicant at the time of submitting this application, the applicant reserves the right within the law to claim as an invention in general or specific terms, whether by way of divisional application or otherwise, any feature, method and/or aspect or any combination of features, methods and/or aspects disclosed herein which is or are subsequently identified to be inventive, and regardless of whether, in the case of a combination as aforesaid, the features, methods and/or aspects are disclosed individually in a single one of or in respective embodiments disclosed herein.

CLAIMS

- 05 1. A face mask comprising a cover for overlying the mouth and a head band for wrapping around the head, said head band being inflatable for sealing against the head to prevent or limit the flow of atmospheric air to the region of the mouth.
- 10 2. A face mask according to claim 1, wherein the cover is adapted to cover substantially all of the face.
3. A face mask according to claim 1 or 2, wherein the cover is of flexible plastics material.
- 15 4. A face mask according to claim 1 or 2, wherein the cover is of rigid plastics material.
- 20 5. A face mask according to any preceding claim, wherein the head band is for wrapping round the head to traverse the claim region.
- 25 6. A face mask according to claim 5, in which there is a second head band which is for wrapping round the head at a higher level, said second band also being inflatable.
- 30 7. A face mask according to any preceding claim, wherein the or each band is of a flexibility, at the side for engagement with the band, which is greater than the flexibility of the remainder of the band.
- 35 8. A face mask according to claim 7, wherein the or each band is an inflatable tube of which the wall at one side is thicker than the wall at the other side to achieve the said greater flexibility.
9. A face mask according to any preceding claim

wherein the or each band is provided with a valve by which the band may be inflated or deflated.

05

10

15

20

25

30

35

1 | 1

