May 6, 1941. G. A. BOESGER 2,240,751

HELMET

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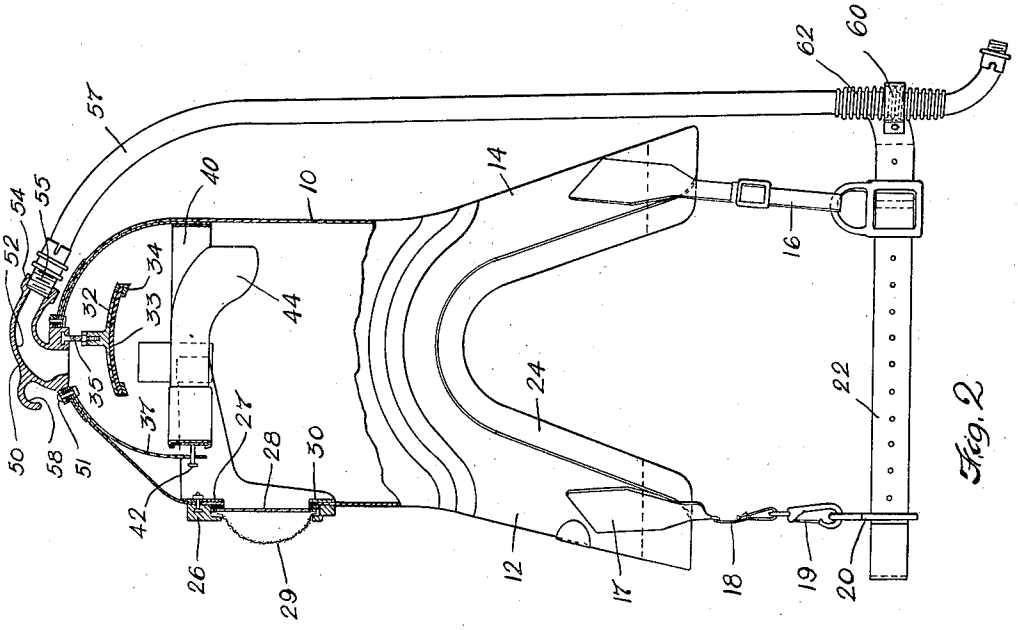

Fig. 2

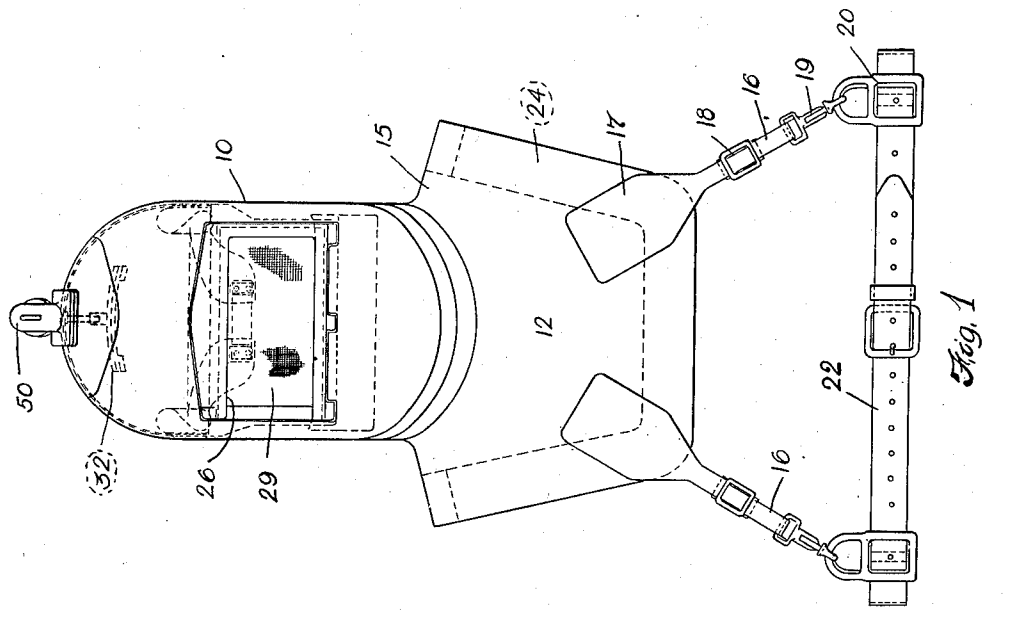

Fig. 1

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HELMET

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4 Claims. (Cl. 128—143)

This invention relates to a helmet for use in a polluted atmosphere and is more particularly directed to a helmet for use in an abrasive blasting room where the air is heavily loaded with finely divided abrasive and other impurities and where the dangers of silicosis are present.

Helmets for use by workmen under the above conditions are common, but insofar as applicant is aware, these helmets have been subject to several disadvantages, among which has been the heavy weight of the unit. The weight has been sufficient to require the operator to support the helmet on his shoulders. Since the area devoted to the sight opening has been small, movement of the wearer's head would remove his eyes from the line of the sight opening and it was necessary that he move his entire body from the shoulders in order to turn the helmet. This resulted in excessive fatigue and discomfort to the wearer. In previous helmets the air-supply hose has been so connected to the helmet that any pull on the hose, due to the movements of the wearer, has been absorbed by the helmet proper and this has been uncomfortable and unsatisfactory.

The general object of this invention has been to devise a lightweight helmet which may be supported on top of the wearer's head and which will turn on movement of the head to maintain the sight opening in alignment with the wearer's eyes. An additional object of the invention has been to devise an inexpensive and light-weight head gear for the purposes set out. A further object of this invention has been to provide means for securing the air supply hose to the wearer's body in such manner that any pull on the hose due to movements of the wearer is absorbed by a body connection rather than by a pull on the head gear.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims; the annexed drawing and the following description setting forth in detail certain structure embodying the invention, such disclosed structure constituting however, but one of various means in which the principle of the invention may be used.

In said annexed drawing—

Fig. 1 is a front elevation of my improved helmet; and Fig. 2 is a side elevation with the upper portion shown in section.

Referring now to Fig. 1, the helmet in general comprises a head fitting envelope **10** merging with a pair of skirt portions **12** and **14**, which lie over the upper chest and back regions of the wearer and each of which merges with a shoulder portion **15** bridging the two skirts. These various portions of the unit are formed of a single sheet of soft flexible seamless rubber, shaped by the anode process. If the rubber sheeting should become damaged it may be patched like an automobile inner tube.

To secure the helmet in place on the body of the wearer, four straps **16** are secured to reinforcing pads **17** cemented or vulcanized onto the helmet proper. A buckle **18** permits adjustment of each strap with respect to its pad to accommodate workmen of different size. A snap **19** at the end of each strap engages a respective aluminum belt ring **20**, which rings are secured to the belt **22** provided with the conventional buckle.

A partial outlet seal between the helmet skirts and the wearer's body is provided by a thick sponge rubber strip **24**, secured as shown in Figs. 1 and 2, around the entire exposed edge of the skirts and shoulder portion. This sponge rubber seal is held fairly closely against the wearer's body by the belt device above described, and provides approximately only sufficient opening to permit the egress of air from the helmet, thus preventing penetration of the polluted air outside the helmet up into position where it may be breathed by the workman.

A sight window is formed in the front portion of the helmet and comprises a cast frame **26** on the exterior side of the sight window and a sheet metal frame **27** on the inside. Bolts pass through the two metal portions secure between them the adjacent edges of the rubber strip. The sight window is closed by a sheet **28** of non-shattering glass, which is covered on the exterior face thereof with a strong, sharply curved reflecting screen **29**. A sealing ring **30**, between the glass and the helmet body prevents leakage of air at this point.

The head of the wearer supports the weight of the helmet and to this end I provide an aluminum head-piece **32**, roughly shaped to conform to the top of the wearer's head. On the lower face of the head-piece is a rubber cushion **33** and at the outer edge of the cushion is an encircling sponge rubber ring **34**. The head-piece threadingly receives a screw **35**, which is carried in the air supply casting hereafter described. By turning the headpiece up or down on the screw and locking the same in position with a suitable lock nut a further adjustment is provided for workmen of different sizes.

An aluminum dome is placed in the inner top portion of the helmet, as indicated at **37**. This helmet supplies protection to the workmen from

objects which may fall on his head, due to the conditions under which he works, and at the same time provides a support for a fibre head band to hold the helmet in place. This head band consists of a fibre ring **40** which is cemented to the aluminum dome at the rear portion thereof and is secured to the forward portion of the dome by the headed pin **42**, permitting the band to move with respect to the dome and adjust itself to the shape of the wearer's head. The forward portion of the band lies against the wearer's forehead and cooperates with a downwardly depending rear portion **44** lying against the back of the wearer's head to keep the headgear from slipping sidewise during use. It will be apparent from the description that when the head band and head-piece are adjusted and the helmet is put on by the wearer the same will be held in such manner that the helmet will turn when the head is turned. Since the helmet is extremely light the entire weight, even when carried by the head for a relatively long period, is not uncomfortable.

An air supply elbow casting, indicated generally at **50**, is secured over an opening at the top of the helmet and dome by screws **51**. A rubber sealing ring prevents leakage of air at this connection. A central opening **52** in the elbow casting connects with a threaded connection **54** which receives the nipple **55** of the air supply hose **57**. The interior of the opening **52** is shaped to provide an expansion chamber for the air as it leaves the hose until just before it is discharged into the helmet, at which time the diameter of the opening is again restricted. This expansion chamber aids in cooling the air supplied to the wearer and is important because a decrease in air temperature of only a few degrees provides a vast increase in comfort to the wearer. A hook **58** is provided in the elbow casting to allow the unit to be hung up when not in use.

Pull on the hose, due to movement of the wearer, is absorbed by the body belt **22** rather than by the elbow connection. To this end, a clamp **60** is secured to the back of the belt and the hose passed therethrough. A coil spring **62** surrounds the hose at this point and lies between it and the clamp. In practice the spring acts to bind the hose in the clamp when the lower portion is bent sufficient to bend the spring, and thus the wearer's movements will bend the spring and bind the hose in the clamp instead of applying a pulling force on the elbow casting. At the same time, when the hose is straightened it may be pulled through the spring to cooperate with the straps **16** in adjusting the unit to the size of the wearer's body.

From the foregoing description it will be apparent that I have provided an improved and very light-weight helmet for the uses set out, which may be easily carried on the wearer's head and turns with the head and prevents uncomfortable pull of the air supply hose on the helmet.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. A light-weight helmet consisting of a layer of soft, non-reinforced rubber of insufficient thickness to support the weight of said helmet and including an apron portion shaped to fit the shoulders of the wearer, and a relatively thick strip of sponge rubber secured to said apron portion adjacent the edge of the latter, and adapted to form a partial seal between said helmet and the body of the wearer.

2. In a helmet, an air supply fitting carried by said helmet in communication with the helmet interior, an air supply hose carried by said fitting, a belt carried by said helmet adapted to encircle a portion of the wearer's body, a clamp carried by said belt, said hose passing through said clamp, and a coil spring encircling said hose and interposed between said hose and clamp.

3. In a helmet, an air supply fitting carried by said helmet in communication with the helmet interior, an air supply hose carried by said fitting, a belt carried by said helmet adapted to encircle a portion of the wearer's body, a collar carried by said belt, said hose passing through said collar, and means interposed between said collar and hose adapted to restrain movement of said hose through said collar when the hose is bent at a point adjacent said collar.

4. A helmet formed to provide a covering for the head of the wearer and a front and back portion to cover the shoulders, an air-supply fitting secured centrally to the top of said helmet, a head pad supported by said fitting and disposed in said helmet in a position to lie on the head of the wearer, and means for adjusting said pad vertically relatively to said fitting.

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