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N. POTASH

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FASTENING OF RIGID PLATES TO SHEET MATERIAL

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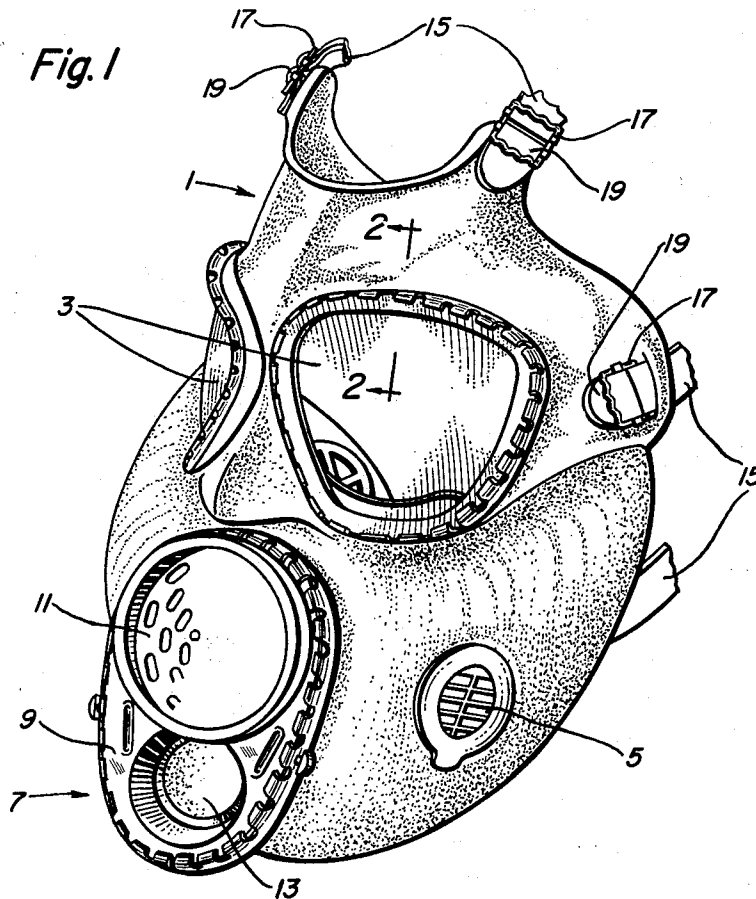


Fig. 2

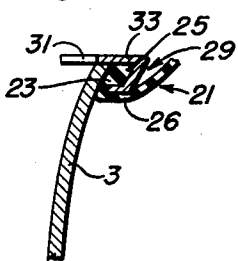


Fig. 3

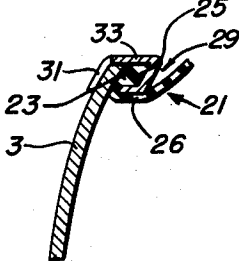


Fig. 4

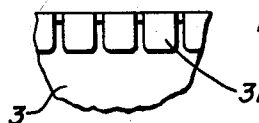


Fig. 5

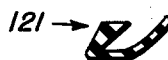
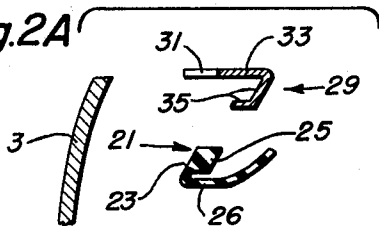


Fig. 2A



INVENTOR
Norman Potash

BY *George Penck*
ATTORNEY

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FASTENING OF RIGID PLATES TO SHEET MATERIAL

Norman Potash, Baltimore, Md.

Application May 6, 1958, Serial No. 733,458

2 Claims. (Cl. 128—141)

(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to me of any royalty thereon.

This invention is directed to structure in which a rigid plate is secured within an opening in flexible, resilient sheet material, such as rubber. While not limited thereto, the invention is of particular utility in connection with gas masks, since it makes it possible to obtain gas-tight connections more simply than heretofore.

The invention will be illustrated in connection with a gas mask of the type shown in the application of Brumfield and Shanty, Serial No. 733,459, filed May 6, 1958.

In the drawings:

Figure 1 is a perspective view of a mask of the type shown in said Brumfield et al. application showing two applications of my invention.

Figure 2 is a sectional view of an eyepiece on the line 2—2, Fig. 1, but at an intermediate stage of manufacture.

Figure 2A is an exploded view of the components of Fig. 2.

Figure 3 is a sectional view of the completed lens, also on the line 2—2, Fig. 1.

Figure 4 is a fragmentary plan view showing the finished product.

Figure 5 is a section showing an edge of the flexible material in slightly modified form.

The mask on which my invention is illustrated will first be briefly described. It comprises a facepiece shown generally at 1. The facepiece is formed of soft, molded, resilient rubber, and includes plastic lenses 3. Each of the lenses is secured in place by the structure of my invention. The bulges shown below lenses 3 enclose pockets containing air purifying units into which air is drawn through air inlets 5 when the wearer inhales.

In the lower front portion of the facepiece is a "voice-mitter"-outlet assembly 7 comprising a plate 9 which is secured to the mask by structure involving my invention. Plate 9 carries a voice transmitter 11 and an outlet valve 13.

The facepiece 1 is secured to the wearer's head by straps 15 carrying slide buckles 17, which are attached to the mask by resilient rubber hooks 19 which are integral with the facepiece 1. This attachment is detailed and claimed in my application Serial No. 733,760 filed May 6, 1958.

The detailed structure constituting my invention will now be described in connection with one of the lenses 3, referring to Figs. 2, 2A, 3 and 4.

The eyepiece opening in the rubber facepiece 1 is

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molded in the form of a continuous hook 21. Hook 21 includes a first leg 23 forming a substantially flat annular supporting surface, which extends radially outward from the boundary 26 of the eyepiece opening. It further includes an angular portion joined to leg 23 and having a thickened reentrant terminal member 25.

A retaining ring 29 is provided which has one edge serrated to form a series of prongs 31. The other edge is formed by a three sided continuous hook member which is of such size as to embrace and mate with resilient hook member 21. This three sided hook includes a first leg 33 which is, at this stage, continuous with prongs 31. It further consists of two successive legs 35 so formed as to fit about the reentrant member 25 of hook 21. In order to secure the tightest possible fit, the ring 29 is made somewhat larger than the initial boundary 25 of the eyepiece opening. The opening is stretched to the required extent and hook 21 is then snapped into the hook portion of member 29 which embraces reentrant portion 25. Lens 3 is then placed against shank portion 23, so that the parts occupy the relationships shown in Fig. 2.

Prongs 31 are then crimped down onto lens 3 as shown in Figs. 1, 3 and 4. It will be noted that this is a very simple operation, which involves merely pressing the prongs down onto the lens. It will be noted also that hook member 21 acts as a cushion for lens 3 during this operation and that there is no tendency to tear or puncture the rubber. Legs 35 are so proportioned that the major pressure is against reentrant portion 25.

The attachment of voicemitter-outlet member 7 is done in exactly the same manner, with plate 9 replacing lens 3 in Figs. 2, 2A, 3 and 4.

Fig. 5 shows a modified hook member 121 which may be used instead of member 21. It is somewhat easier to mold. Member 21, however, is somewhat more effective as a securing means.

If the lens 3 is made of glass, rather than plastic, it is desirable to provide a cushion of soft rubber between prongs 31 and lens 3.

While I have described one embodiment of my invention, it will be obvious that changes are possible. I therefore wish my invention to be limited solely by the scope of the appended claims.

I claim:

1. In a device of the class described, a sheet of soft, flexible, resilient material defining an opening, said material at the boundary of said opening being in the form of a continuous resilient hook, said resilient hook comprising a leg having a substantially flat annular supporting surface encircling said opening and a reentrant member extending inwardly toward said opening, a plate of substantially rigid material covering said opening and lying against said substantially flat annular surface and having its outer edge at the outer edge of said surface, a one piece retaining ring comprising a continuous rigid hook tightly embracing said continuous resilient hook and a plurality of locking prongs crimped against the outer surface of said plate.

2. A method of mounting a substantially rigid plate on an opening in sheet material comprising providing a sheet of soft resilient material defining an opening, the boundary of said opening comprising a molded, integral resilient continuous hook, said hook comprising a leg forming a substantially flat continuous annular support-

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ing surface encircling said opening and extending outwardly from said opening and a reentrant portion extending inwardly from the outer edge of said leg, providing a one piece retaining ring having one edge serrated to form a series of prongs and the other edge formed as a continuous rigid hook, said rigid hook comprising a first leg continuous with said prongs and successive legs so formed as to embrace, and substantially mate with, said reentrant portion of said resilient hook, forcing said resilient hook into mating relationship with said

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rigid hook, placing said rigid plate member against said supporting surface, and crimping said prongs against said rigid plate member.

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