Patented Dec. 11, 1934 1,984,164

UNITED STATES PATENT OFFICE

1,984,164

PROCESS AND APPARATUS FOR PURIFYING AIR VITIATED WITH MERCURY VAPORS

Alfred Stock, Karlsruhe, Germany, assignor to Degea Aktiengesellschaft (Auergesellschaft), Berlin, Germany, a corporation of Germany

No Drawing. Application June 27, 1932, Serial No. 619,518. In Germany June 30, 1931

5 Claims. (Cl. 23—4)

It is well-known that the slightest quantities of mercury vapor contained in the air, will be sufficient to cause heavy and chronic illness. For instance, open mercury surfaces exposed in closed rooms, as such are always present in scientifical and technical laboratories, will constitute a great danger to persons compelled to work in such rooms, since the mercury will set free comparatively great quantities of vapor into the atmosphere even at normal temperatures. The danger is still enhanced, if heated mercury or mercury vapors are concerned, which latter—as is well-known—are utilized of late for the operation of turbines. A danger which must not be underrated is caused in addition by such quantities of mercury which will drop to the ground in connection with tests, where manometers and similar instruments often are broken, and which will be deposited under the wash-boards, in the joints of the floor-boards and the like, from whence it will hardly be possible to remove it in most instances. This danger is the severest, since in most cases the source of danger is unknown to those working in such locality.

The present invention has for its object to purify air vitiated mercury vapors and to render them harmless to breathing. It has already been suggested to employ active carbon as a means of protection against the effects of mercury vapors, and it was further recommended to use cotton-wool coated with colloidal gold as a protective.

According to the invention it was found that in the process of purifying air vitiated with mercury vapors, adsorption agents which are impregnated with a halogen will constitute a protective agent which is incomparably superior to any of the above mentioned protectives. For instance, active carbon impregnated with iodine will surpass the protective action of non-impregnated active carbon about ten times. The substances having large superficial area will adsorb the mercury vapors and the adsorbed mercury is fixedly bound in the form of mercury halogenid within the pores by the halogen contained in said pores. The protective agent used according to the present invention, may be employed, for instance, for distribution to form a film or cover over open mercury surfaces, as such are unavoidable in scientific and technical laboratories. Through a layer of a protective agent of the character indicated above, having a thickness of one centimetre, only such traces of mercury will pass, which come near the lowest limit of demonstrability, when using the most modern analyzing methods to detect the presence of such slightest traces of mercury vapor. Besides, the cracks or fissures in the floor-boards may be filled with the protective agent, so that even in this instance the danger of becoming poisoned through concealed little drops of mercury is prevented. Instead of active carbon, I may employ silica gel or metal gels as the adsorption agent impregnated with a halogen.

According to another example of carrying out my improved process, a protective agent of the character set forth above would be used as a filler for filters of breathing apparatus, and when air vitiated with mercury vapors is breathed through such an apparatus, it would be purified effectively so as to avoid the deleterious effects of such vapors.

I claim:

1. The process of purifying air vitiated with mercury vapors, which consists in removing said vapors by means of an adsorption agent impregnated with a halogen.

2. The process of purifying air vitiated with mercury vapors, which consists in removing said vapors by means of active carbon impregnated with a halogen.

3. The process of purifying air vitiated with mercury vapors, which consists in removing said vapors by means of silica gel impregnated with a halogen.

4. The process of purifying air vitiated with mercury vapors, which consists in removing said vapors by means of a metal gel impregnated with a halogen.

5. A breathing apparatus for use in air vitiated with mercury vapors, having a filter filled with a purifying substance consisting of an adsorption agent having a large superficial area and impregnated with a halogen.

ALFRED STOCK.