

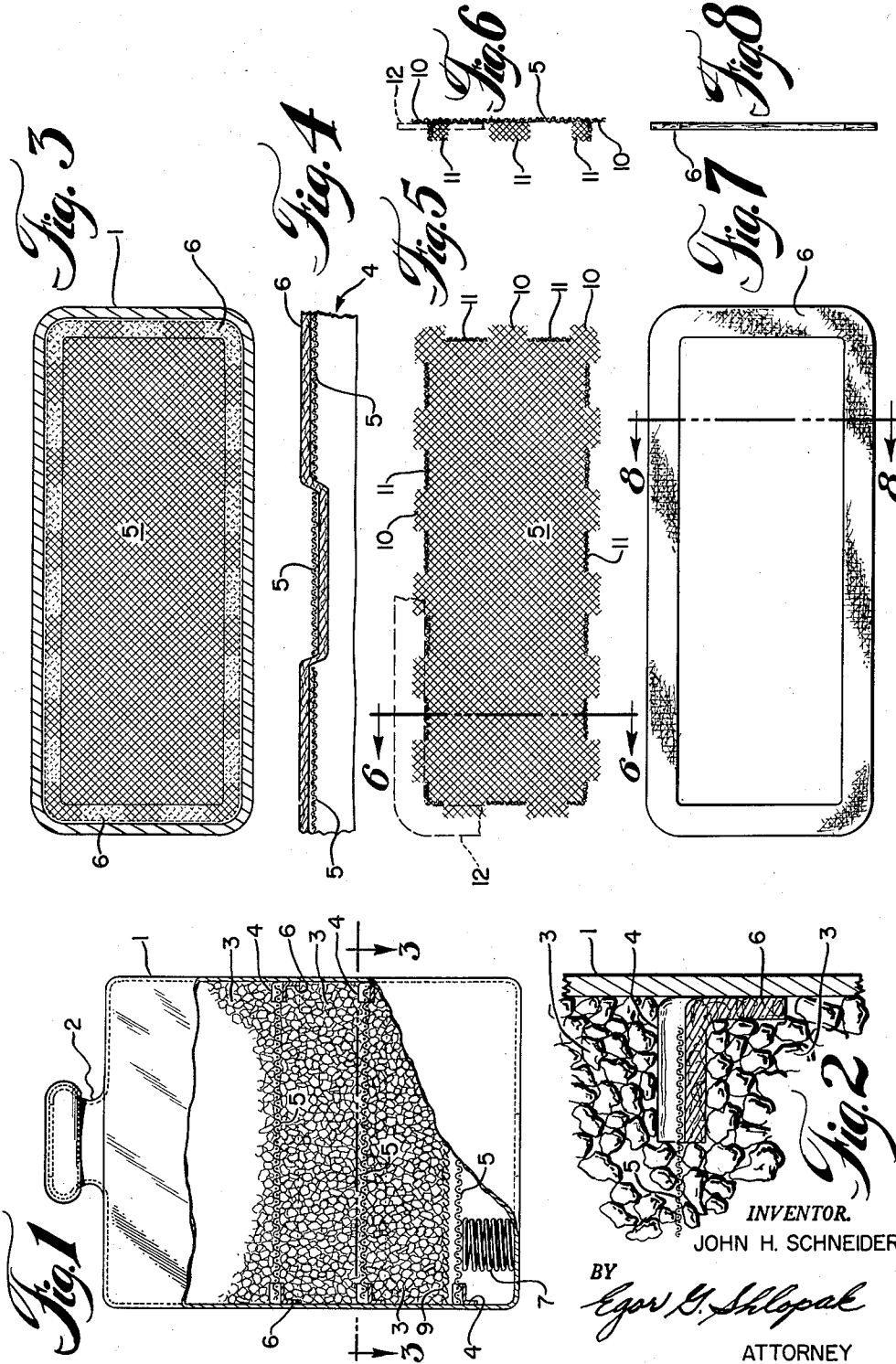
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COMBINED SEPARATOR AND BAFFLE

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COMBINED SEPARATOR AND BAFFLE

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3 Claims. (Cl. 183—51)

This invention relates to a combined separator and baffle, and more particularly to a combined separator and baffle used in air purifying canisters for breathing apparatus.

Canisters, with which this invention pertains, are of the types used with breathing apparatus and having materials reactive with contaminated atmospheres to provide breathable air to the user of the apparatus. Such canisters usually comprise several layers of purifying chemicals customarily granular in form. When more than one chemical composition is used, it is conventional to use a separating means between the different chemicals to maintain proper alignment and depths of chemical layers when the canisters are being filled and in use to prevent indiscriminate mixing of the chemicals and provide correct purification. Also, it is conventional to use a foraminous material such as a screen for the separators to permit passage of air therethrough. Where it is desired that the air be mechanically filtered in addition to chemical purification, fiber-glass filters, and the like, are employed with the separators. These filters are usually located at the top and bottom of the canister along with the separators to prevent chemical fines mixed with the granules from passing out of the canister, especially into the breathing apparatus.

It is known that separators of themselves are not sufficient to prevent chemical fines from passing into the breathing circuit even when a mechanical filter is used in conjunction with the separator, since the fines pass around the edges of both the separator and filter. Furthermore, respiratory air tends to channel at the sides of the canister since this area is one of least fluid resistance. Therefore, it has been found necessary to provide a baffle with the separator which functions to prevent channelling by diverting the air away from the canister sides and provide a sealing means to prevent the fines from passing around the edges of the separator.

Up to the time of this invention, the standard practice of fabricating a combined baffle and separator, for the purposes aforementioned, was to stamp out a flat screen, or the like, substantially to the size of the canister, and attach a baffle of flexible material circumferentially of the screen by stapling the two parts together. Such a fabricating procedure has been found to be highly unsatisfactory due to the difficulty of providing a strong connection between the baffle and separator, and of accurately positioning the two together whereby the combined baffle and screen could be properly located in the canister. Furthermore, such manufacture is expensive because of the manufacturing time required, and because reinforcing material would be necessary in addition to the staples. Unless the baffle and separator are accurately fabricated, it will not be possible, from a practical standpoint, to effectively prevent channelling of the respiratory air and prevent the chemical fines from passing into the breathing circuit.

Accordingly, it is the primary object of this invention to provide a combined baffle and separator which may be

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accurately, easily and inexpensively fabricated. It is a further object to provide a combined baffle and separator whose parts are properly positioned relative to each other, and whose parts are securely attached. A further object of this invention is to provide a combined baffle and separator, which when used in a canister, will prevent channelling of respiratory air and prevent chemical fines from passing out of the canister. Another object of the invention is to provide a combined baffle and separator comprising a screen having alternate portions of its edges stamped to provide a securing means for the baffle and provide a guide for accurately positioning the baffle onto the screen; the baffle extending circumferentially of the screen and having an edge extending beyond the edge of the separator providing a sealing means.

Further objects and advantages will become apparent from the following specification and drawing in which:

Fig. 1 is a vertical elevational view, partly in section, of a canister containing the combined separator and baffle of this invention;

Fig. 2 is an enlarged fragmentary sectional view of the canister shown in Fig. 1;

Fig. 3 is a horizontal sectional view taken on line III—III of Fig. 1;

Fig. 4 is an enlarged side view in vertical elevation of the separator and baffle shown in Fig. 3;

Fig. 5 is a plan view of the separator as it appears prior to its being secured to the baffle, and includes a fragmentary phantom view of the baffle prior to attachment;

Fig. 6 is a vertical sectional view of the separator taken on line VI—VI of Fig. 5 and showing a fragment of the baffle in phantom lines;

Fig. 7 is a plan view of the baffle; and

Fig. 8 is a vertical sectional view of the baffle taken on line VIII—VIII of Fig. 7.

Referring to Fig. 1, canister 1 is shown having a metal casing and provided with an inlet for air to be breathed and an outlet for purified air. A neck portion 2 is provided for canister 1 for association with a facepiece by appropriate connections. Suitable layers 3 of purifying chemicals in the form of granules are placed into canister 1. The number of layers is dependent upon the desired lay-up of chemicals to be used. This is accomplished by turning the canister upside down and filling it from the bottom, and then sealing the bottom as by soldering. The type of canister and its details, including the type of chemicals used, form no part of the present invention other than those details as are specifically associated with the combined separator and baffle hereinafter described and claimed. Generally, consideration need be given only to the fact that canister 1 comprises a casing and is filled with layers 3 of purifying chemicals separated and/or confined by the combined separator and baffle of this invention.

The combined separator and baffle member is generally indicated by numeral 4 and comprises a separator 5 and baffle 6. As will be noted in Fig. 1, a plurality of members 4 are shown separating and confining layers 3 of chemicals. The lowermost member 4 is retained against the lowermost layer 3 by spring members 7 (only one shown) maintaining successive layers compact in canister 1. A mechanical filter 9, made from fiber-glass for example, overlays member 4 and functions to prevent the passage of any chemical fines from escaping to the bottom of the canister while permitting the passage of air. An identical mechanical filtering arrangement (not shown) is provided for the top of the canister to overlay the uppermost member 4 (not shown) to prevent fines from entering the breathing circuit. Springs 7 acting upon element 4 hold the granular chemical charge firmly in place during transportation, handling, and the use of the

canister. This avoids the abrasive action with formation of fines that might occur if the granules were loose and free to rub against one another.

Separator 5 is formed from a flat foraminous material, and generally, from metallic screen of a mesh smaller than the chemical granules, and is stamped to the general rectangular shape of canister 1. Noting particularly Figs. 5 and 6, when separator 5 is fabricated, it is stamped to shape and formed with alternately spaced securing tongues 10 and 11, respectively, around the periphery of separator 5. Tongues 11, during fabrication are bent upwardly, leaving spaced horizontally disposed tongues 10. Baffle 6 is flat, rectangularly shaped as separator 5, and is similar in appearance to a frame-shaped member. Baffle 6 is formed from a suitable flexible material, such as either felt, glass cloth, or cotton. When assembling baffle 6 and separator 5, the baffle is placed over and around the periphery of the separator to overlay tongues 10 with the inner edge of the baffle abutting upwardly extending tongues 11. Thus, tongues 11 form a jig or a guide for placement of the baffle on the separator. This assembly is partially depicted in Figs. 5 and 6 by phantom lines. After baffle 6 and separator 5 have been so assembled, tongues 11 are depressed in coplanar relationship with tongues 10 to firmly secure both members together. By specifically referring to Fig. 4, it is seen that the separator 5 and baffle 6 are secured in an interlacing manner whereby they will not come apart. As assembled, baffle 6 extends beyond the edges of tongues 10 and 11 to provide a free sealing edge 12 which is bent downwardly when member 4 is placed in the canister (Figs. 1 and 2). Thus, alternate sets of tongues of the separator overlay and underlay, respectively, the baffle when member 4 is assembled, and the tongues provide a jig for positioning the baffle relative to the separator.

With the combined separator and baffle member 4 positioned in canister 1, member 4 provides a novel means for separating various layers 3 of granular chemicals and a support for mechanical filters, and the like, to prevent fines from escaping either through the bottom or the top of the canister. Also, sealing edge 12 of baffle 6 fabricated from substantially gas-impervious material closely hugs the side wall of canister 1 to provide a seal for preventing fines from passing through the canister around the edges of member 4; and the portion of baffle 6 attached to the separator provides a baffling means to prevent channelling of the air by diverting the air away from the sides of canister 1. Since the air must go around baffle 6, efficient purification through the chemical is provided. At the same time, the combined separator and baffle member 4 may be easily and inexpensively fabricated, requiring nothing more than integral cooperating parts of the separator and baffle for accurately and securely attaching the two together.

Having described the principle of the present invention and having illustrated and described what is considered to be the best embodiment, it is to be understood that,

within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A combined separator and baffle for air purifying devices comprising a first member for separating solid materials and a frame-shaped member substantially impervious to gases surrounding said first member, integral securing tongues extending along the peripheral edge of said first member, said members being attached together at the periphery of said first member by said tongues, and said frame-shaped member interlacing said tongues to form an integrated unit when said members are attached.

2. A combined separator and baffle for air purifying devices comprising a foraminous separator member and a flexible frame-shaped baffle member surrounding said separator member, integral securing tongues extending along the peripheral edge of said separator member, said members being attached at the periphery of said separator member by said tongues, said baffle member interlacing said tongues to form an integrated unit when said members are attached, and said baffle member extending beyond the outer edges of said tongues providing a flexible free edge.

3. A combined separator and baffle for air purifying devices comprising a flat foraminous separator member and a flexible frame-shaped baffle member surrounding said separator member, integral securing tongues extending along the peripheral edge of said separator member, said tongues being constructed and arranged to provide a locating means for the frame-shaped baffle member when alternate tongues are bent substantially perpendicular to the separator member and to provide an interlacing with said baffle member when the said alternate tongues are rebent substantially horizontal to the separator member forming an integrated unit of said separator and said baffle members, and said baffle member extending beyond the outer edges of said tongues providing a flexible free edge.

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