

July 9, 1957

W. E. GROSS
CANISTER SPRING
Filed Oct. 26, 1951

2,798,718

Fig. 1.

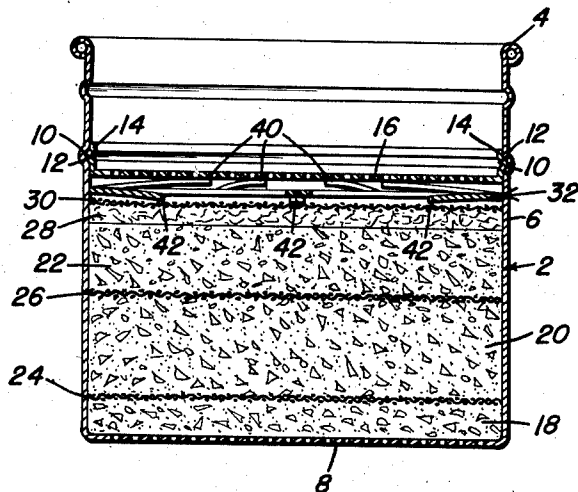


Fig. 2.

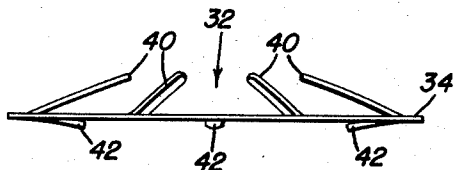


Fig. 3.

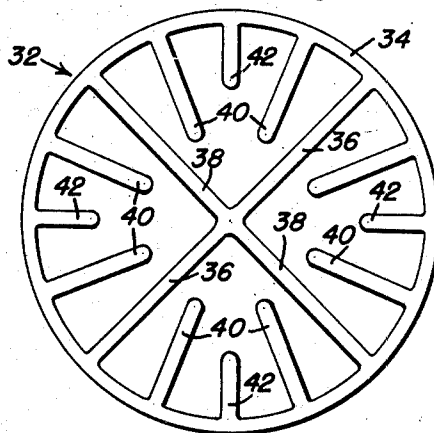


Fig. 4.

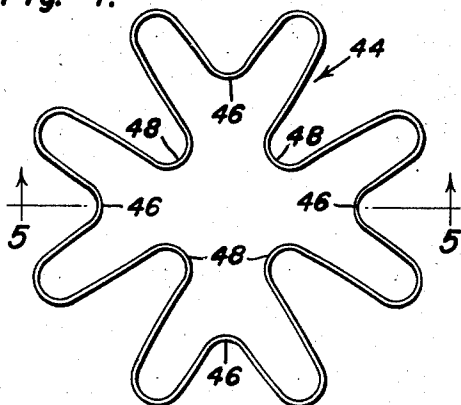
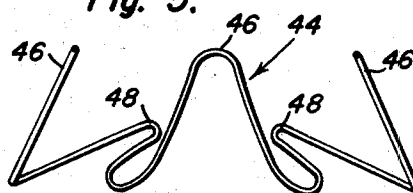


Fig. 5.



INVENTOR.

BY *George Penahan*
William E. Gross
ATTORNEY

1

2,798,718

CANISTER SPRING

William E. Gross, Joppa, Md.

Application October 26, 1951, Serial No. 253,437

3 Claims. (Cl. 267—1)

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

The invention described herein may be manufactured and used by or for the Government for governmental purposes with the payment to me of any royalty thereon.

The invention relates generally to canisters for gas masks and specifically to an improvement in auxiliary canisters of the type shown in my United States Letters Patent No. 2,442,356.

It has been found that a shortcoming of contemporaneous canisters that employ a soft, air-purifying filling is that upon rough handling they become inefficient. This occurs because the filling reduces in volume during rough handling due to attrition, and reduction in volume of the filling results in the formation of voids which permit the gases to channel. It is an object of this invention to eliminate this major shortcoming in contemporaneous canisters.

It is a further object of this invention to provide a canister wherein the filling is constantly maintained under an evenly distributed pressure thereby preventing the formation of voids in the canister filling.

It is a still further object of this invention to provide a canister wherein the filling is constantly maintained under an evenly distributed pressure by a specially designed resilient member which requires a minimum amount of space and therefore does not enlarge the over-all dimensions of the canister to any appreciable extent.

It is a specific object of this invention to provide alternate types of specially designed resilient members which require a minimum amount of space, which constantly exert an evenly distributed pressure on the filling of a canister, which will not shift or become displaced when the canister is subjected to rough handling and which are readily adapted to be used in canisters of any cross-section.

It is another specific object of this invention to provide an improved compression spring which evenly distributes its pressure over a wide area, which requires relatively little axial space in comparison to conventional compression springs, which does not become displaced readily when subjected to rough handling and which may be formed in any cross-section desired and still function effectively.

For a more detailed description of the invention, reference is made to the accompanying drawings, wherein: Fig. 1 shows a sectional view of the improved canister. Fig. 2 is a side elevation of the resilient element shown in Fig. 1. Fig. 3 is a top view of the element shown in Fig. 2. Fig. 4 is a top view of an alternate resilient element. Fig. 5 is a sectional view taken on line 5—5 of Fig. 4.

Referring to the drawings and particularly to Fig. 1, reference numeral 2 represents an auxiliary canister which has an open end 4 which is adapted to be telescoped over the bottom portion of a conventional canister (not shown). Auxiliary canister 2 comprises generally cylindrical wall portion 6 and perforated, flat, end portion 8. Annular groove 10 is formed in the inner side of cylin-

2

drical, wall portion 6 and is adapted to receive annular bead 12 formed on rim portion 14 of the perforated retaining plate 16 and thereby position said retaining plate.

The chamber formed by cylindrical, wall portion 6, end portion 8 and retaining plate 16 may be filled with any desired air-purifying filling. For the purpose of illustration, the filling shown comprises a layer 18 of silica gel, a layer 20 of charcolite and a layer 22 of hopcalite. The layers are separated by separator 24 of scrim and wire screen 26. A pad 28 of rockwool is positioned on top of the layer 22 of hopcalite and a wire screen 30 is positioned on top of the pad of rockwool. Compression spring 32, the detailed construction of which will be subsequently described, is positioned between screen 30 and retaining plate 16.

The canister purifies air in the same manner as contemporaneous canisters. Perforated, end portion 8 constitutes an air inlet through which contaminated air enters; the contaminated air passes through the filling where it is purified and exists through perforated retaining plate 16 which constitutes an air outlet.

The details of compression spring 32 are shown in Figs. 2 and 3. Compression spring 32 is a sheet steel stamping and may be of any shape. For use with cylindrical canister 2, a circular spring is used. Compression spring 32 specifically comprises annular, rim portion 34, intersecting through-spokes 36 and 38, long legs 40 and short legs 42. As can be best seen in Fig. 2, long legs 40 are bent upwardly out of the plane of rim 34, and short legs 42 are bent slightly downwardly out of the plane of said rim portion. When mounted in assembled position (see Fig. 1), the compression spring 32 is axially compressed and therefore occupies less axial space than when it is free. Long legs 40 contact retaining member 16 and constitute the main tensioning means, whereas short legs 42 contact screen 30 and act to distribute the pressure exerted by the long legs 40 evenly over the surface of screen 30 and then to the filling. With this arrangement, the filling is constantly under pressure. This prevents voids from forming in the filling (particularly soft fillings) when the volume of the filling is reduced by attrition of the granules during rough handling. Since voids permit channeling of gas, my arrangement prevents channeling of gas by keeping the filling compact at all times. It should be noted that my compression spring requires very little axial space as compared to conventional compression springs and that therefore the size of the canister is not increased appreciably. Since canister size and weight is of utmost importance, this feature is highly desirable. It should be noted that spring 32 may be made in any desired cross-section, such as square, rectangular, etc., depending upon the cross-section of the canister or other receptacle where it is employed.

The alternate form of spring shown in Figs. 4 and 5 is substantially the same as spring 32 in function but differs in structure and method of manufacture. Spring 44 is formed of wire into the shape illustrated. Upstanding loops 46 are equivalent to the long legs 40 of the first type of spring, and shorter loops 48 correspond to short legs 42. Spring 44 functions similarly to spring 32 with the exception that short loops 48 are not bent downwardly as short legs 42 are; this is so because short loops 48 tend to turn downwardly when pressure is applied to the upstanding loops 46. As in spring 32, the longer loops are the tensioning means, and the shorter loops are the distributing means.

I have illustrated my improved canister as one of the auxiliary canister type. I do not intend thereby to limit myself to the illustrated type for my improved compression springs may be employed in other types of canisters

3

and in other structures wherein a compression spring having the attributes of mine is desired.

Having fully described my invention for the purpose of illustration, it is to be understood that I do not intend thereby to limit myself to the details of construction shown but intend to include such modifications as come within the scope and spirit of the appended claims.

I claim:

1. A compression spring comprising an annular rim, elongated radially and axially extending tensioning legs, and elongated radially and axially extending pressure distributing legs, said tensioning legs extending in the axial direction opposite to that of said pressure distributing legs, said tensioning legs being longer than said pressure distributing legs.

2. A device as defined in claim 1 wherein said tensioning legs extend away from the plane of the rim at a greater angle than said pressure distributing legs.

4

3. A device as defined in claim 2 wherein the spring is an integral sheet metal stamping.

References Cited in the file of this patent

UNITED STATES PATENTS

617,177	Nickey	Jan. 3, 1899
1,275,396	Corcoran et al.	Aug. 13, 1918
1,501,286	Logan	July 15, 1924
1,961,438	Winter	June 5, 1934
1,995,116	Drissner	Mar. 19, 1935
2,225,990	Henry	Dec. 24, 1940

FOREIGN PATENTS

693,959	France	Nov. 27, 1930
335,580	Italy	Feb. 6, 1936