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S. MILLER ET AL

2,653,608

INSUFFLATOR

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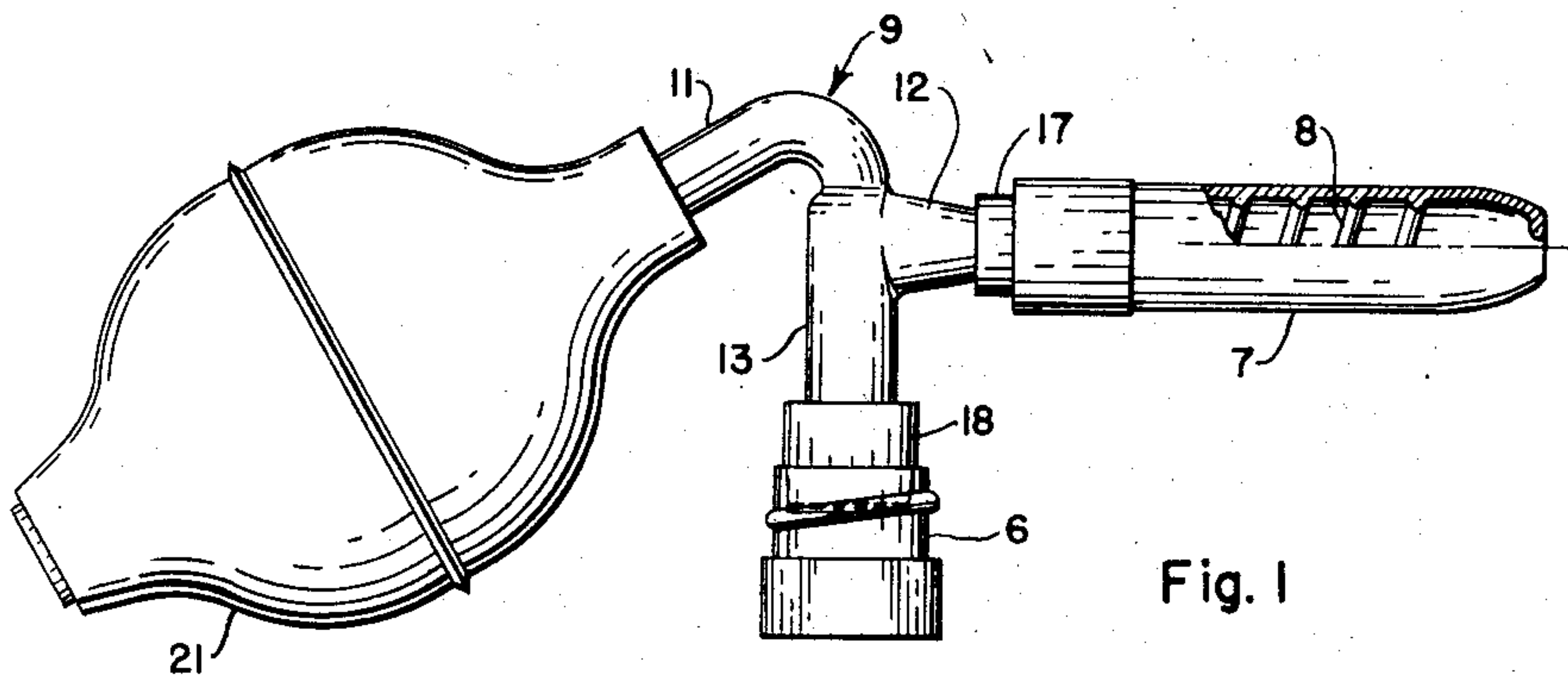


Fig. 1

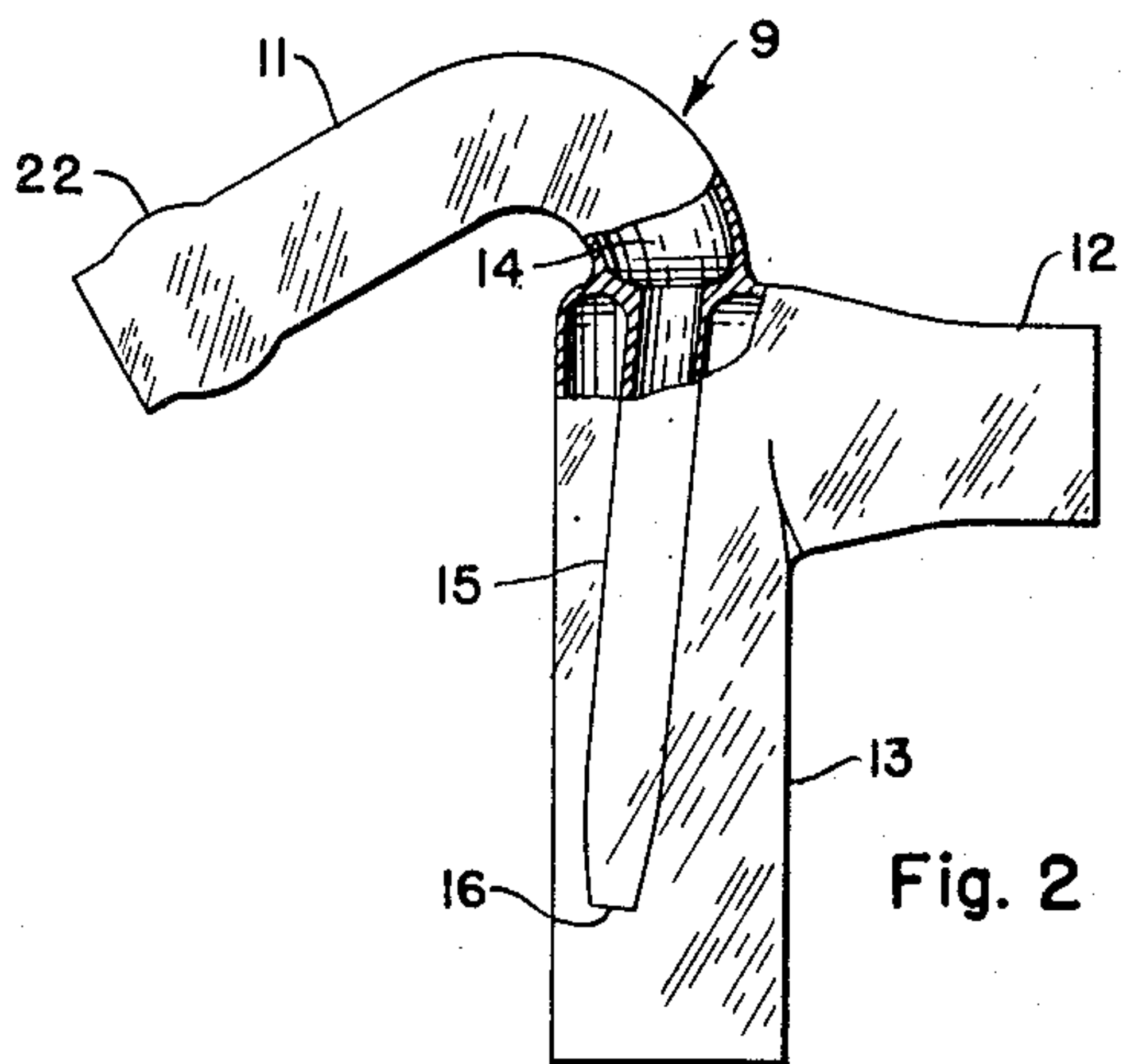


Fig. 2

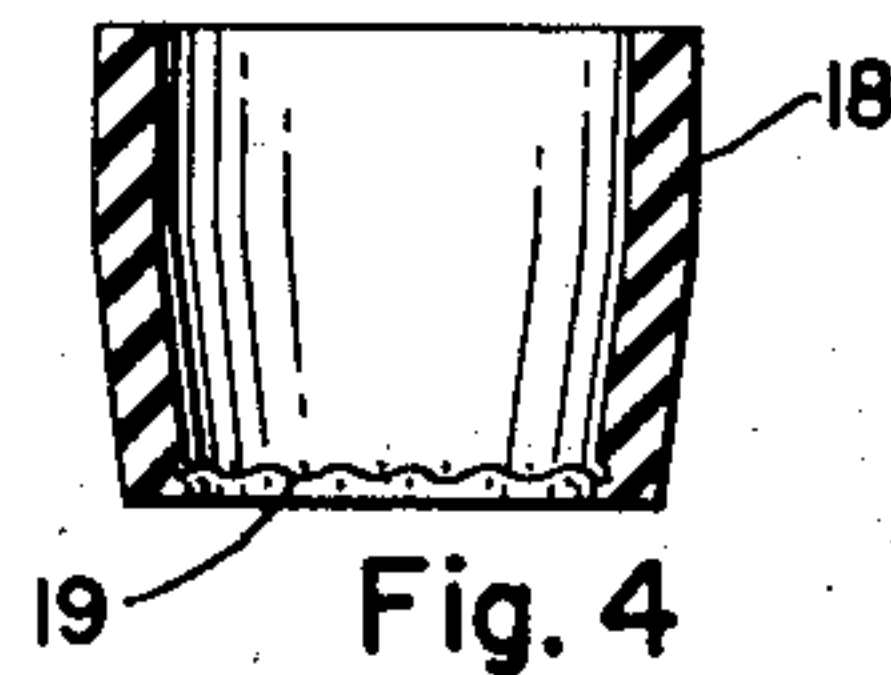


Fig. 4

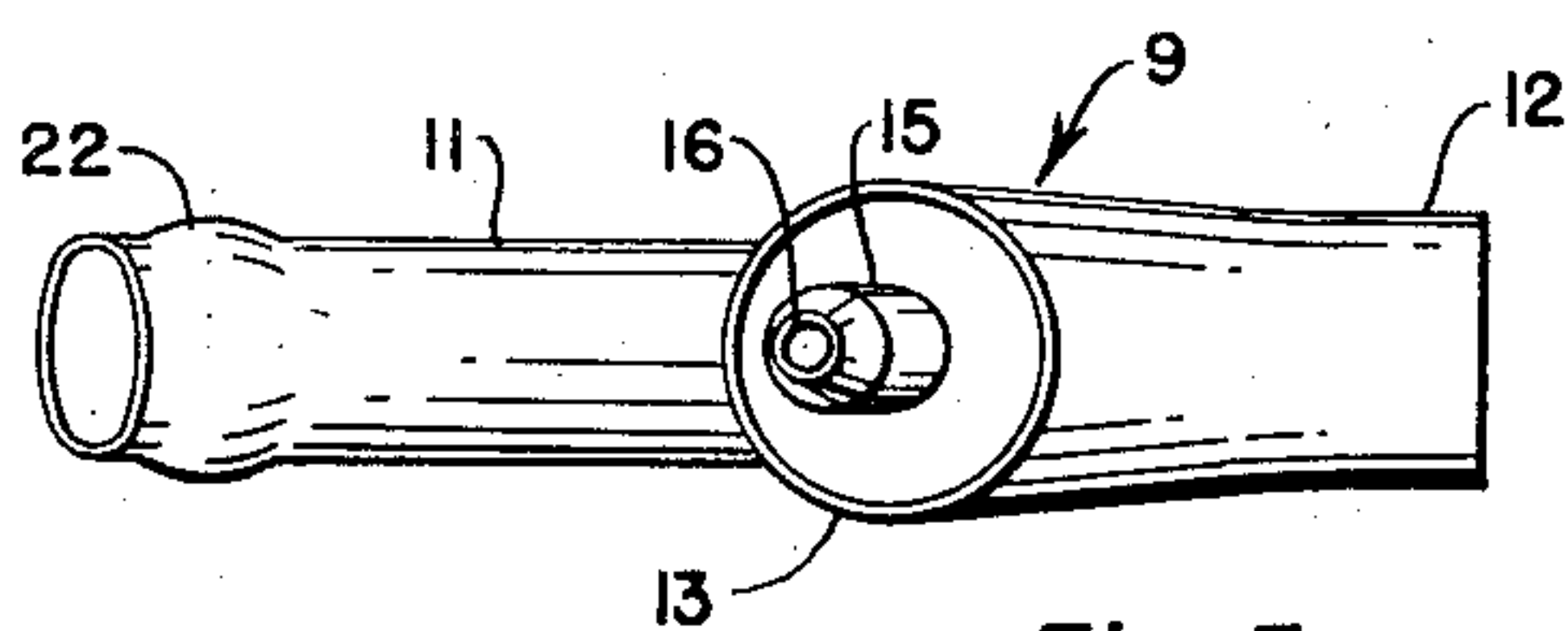


Fig. 3

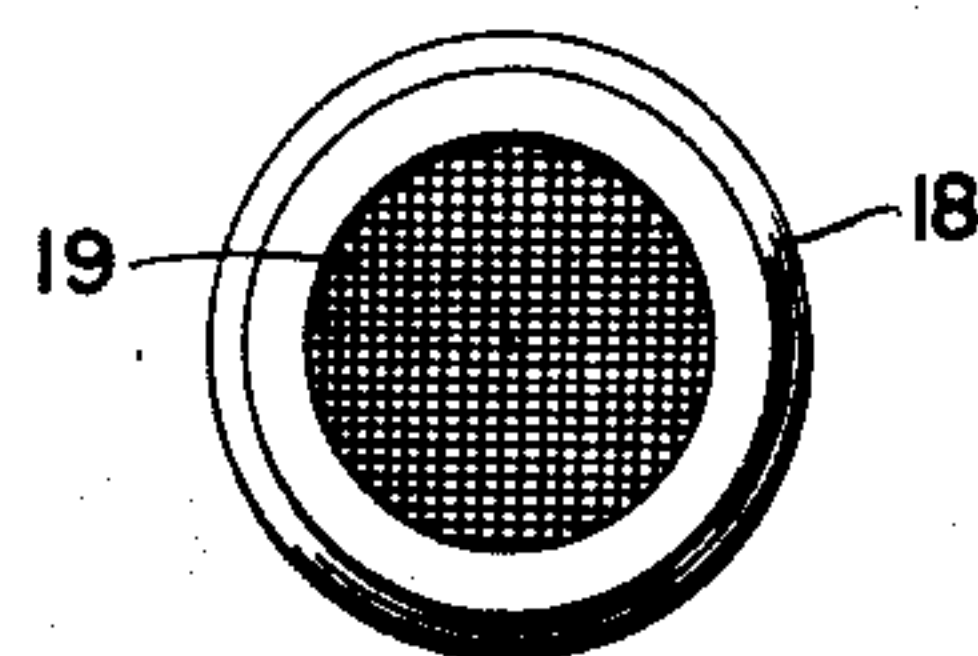


Fig. 5

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2,653,608

INSUFFLATOR

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8 Claims. (Cl. 128—266)

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This invention relates to inhalers, and relates more particularly to a modified inhaler for use with powdered inhalants.

In our United States Patent No. 2,604,094 of July 22, 1952, there is described a novel and highly advantageous inhaler for powdered inhalants such as powdered penicillin, for example, which has come into wide use as a medicament for respiratory ailments. In use, suction is applied to the inhaler by the mouth or nose of the user to draw the powdered inhalant into the same. It is often desirable or necessary to introduce a powdered medicament directly into the oral cavity. Accordingly, it is an important object of our invention to provide a novel arrangement for dispensing powdered inhalants.

Another object of this invention is the provision of a novel attachment which may be applied to a suction inhaler whereby there is produced a device adapted to eject or apply the inhalant at the point desired for its most effective use.

A further object of this invention is to provide in the powdered inhalant dispensing device a screen which is placed in such position as not only to prevent too large particles or agglomerates from being dispensed but also to assist in smashing the particles or agglomerates to form an aerosol.

Other objects of this invention, together with certain details of construction and combinations of parts, will appear from the following detailed description and will be pointed out in the appended claims.

In the accompanying drawing wherein a preferred embodiment of our invention is shown:

Fig. 1 is a side elevation view of the device of our invention partly broken away to show the internal structure of the contact tube,

Fig. 2 is a detail view, on a slightly enlarged scale, of the connecting tube, with a portion thereof broken away to show the internal structure.

Fig. 3 is a bottom plan view of the connecting tube,

Fig. 4 is a cross-sectional view of a gasket showing a screen mounted therein, and

Fig. 5 is a bottom plan view of the gasket shown in Fig. 4.

Like reference numerals indicate like parts throughout the several views of the drawing.

Referring now to the drawing for a detailed description of our invention, the reference numeral 6 indicates the receptacle and reference numeral 7 the contact tube, having the integral

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helical rib 8, of the inhaler shown in the said Patent No. 2,604,094.

In accordance with our invention, the receptacle 6 and contact tube 7 are operatively joined by means of a connecting tube, indicated generally by reference numeral 9, of somewhat T-shape, having a curved tubular arm 11, a straight horizontal tubular arm 12 and a vertical cylindrical section 13. Autogenously fixed within the inner end 14 of curved arm 11 is a capillary tube 15 which extends a substantial distance within vertical section 13 and is bent or tilted backward, i. e. with respect to the exit end 12 of the connecting tube 9. Positioning the capillary tube 15 as shown makes for greater turbulence of the powder, when air is passed through said capillary tube, thus preventing the powdered inhalant from depositing in the receptacle. The size of the tip opening 16 of the capillary tube 15 and its position with respect to the bottom of receptacle 6 depends upon the type of inhalant employed. Thus, where penicillin is employed, for example, the tip opening 16 should be at most from 0.04 to 0.05 of an inch in diameter and should be not more than $\frac{1}{16}$ of an inch above the bottom of the receptacle receiving the penicillin cartridge.

The connecting tube of our device may be made of any suitable material such as metal, glass, ceramics or plastics. It is preferred, however, to make the same of "Pyrex" glass whereby the same may be subjected to heat sterilization with small danger of breaking the same.

The contact tube 7 is mounted on arm 12 by means of a gasket 17 which is preferably of rubber but which may be of any other suitable material. A gasket 18 of rubber or other suitable material is also employed for mounted vertical section 13 of connecting tube 9 in the receptacle 6. However, gasket 18 is provided at its bottom or inner portion with a screen 19 of the desired mesh. It is much more advantageous to place the screen in gasket 18 rather than in, say, gasket 17 since the force of the air stream at this point is greater, and greater shearing effects are accomplished when the powdered inhalant comes into contact with the screen to smash the particles or agglomerates thereof.

To supply air to the receptacle to force therefrom the powdered material there is provided a rubber bulb 21, of the usual type. The bulb is mounted on curved arm 11 and is retained thereon by a circumferential blister 22.

The improved inhalent dispenser per se, consisting of the receptacle 6 and the contact tube

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7 which is adapted to be inserted in receptacle 6 for purposes of applying the medicament to the nose or mouth by suction is described and claimed in our aforementioned Patent 2,604,094.

It will be understood that our novel device may be employed effectively as a combination inhaler and insufflator for dispensing in the form of an aerosol any powdered or finely divided medicament. Moreover, the contact tube and receptacle may be of such inexpensive material that it is disposable after use, while the connecting tube may be sterilized and re-used.

The embodiment of our invention shown and described herein is to be considered merely as illustrative, as our invention is susceptible to variation, modification and change within the spirit and scope of the appended claims.

We claim:

1. A dispenser of the class described, in combination with a contact tube and receptacle for holding the material to be dispensed, a tube connected to said contact tube and receptacle, a source of air connected to said tube, said tube having a vertical portion inserted in said receptacle and a horizontal arm inserted in said contact tube, a gasket between said vertical portion and said receptacle, and a screen in said gasket for breaking up and preventing passage therethrough of large particles or agglomerates of said material.

2. The combination with an inhalator having a receptacle containing material to be dispensed and a contact tube connected to said receptacle, of an insufflator adaptor comprising a tube interconnecting said receptacle and said contact tube, a source of air under pressure connected to said tube, and means in said tube for applying a stream of air from said source to said receptacle at an angular direction against the normal surface of the material within said receptacle.

3. The combination with a disposable inhalator having a receptacle for holding the material to be dispensed and a contact tube connected to said receptacle, of an insufflator adaptor comprising a tube connected to said contact tube and receptacle, said tube having a first extension inserted in said receptacle and a second extension inserted in said contact tube, a source of pressurized air connected to said tube, and means in said first extension for applying air from said source to said receptacle in a direction inclined to the normal surface of the material within said receptacle.

4. The combination with a disposable inhalator having a receptacle containing material to be dispensed and a contact tube removably positioned in said receptacle, of an insufflator adaptor comprising a tube interconnecting said contact tube and receptacle, said tube having a first extension inserted in said receptacle and a second extension inserted in said contact tube, a source of pressurized air connected to said tube, baffle means between said first extension and said receptacle for breaking up and preventing passage therethrough of large particles and agglomerates of said material, and means in said first extension for applying a stream of air from said air source to said receptacle at an angular direction to the normal surface of the material contained within said receptacle.

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5. A dispenser of the class described, in combination with a contact tube and receptacle for holding the material to be dispensed, a tube connecting said contact tube and receptacle, said tube having a vertical portion inserted in said receptacle and a horizontal arm inserted in said contact tube, a source of air pressure connected to said tube, and means in said vertical portion for applying air from said source to said receptacle at an angular direction to the normal surface of the material within said receptacle.

6. A dispenser of the class described, in combination with a contact tube and receptacle containing the material to be dispensed, a tube connecting said contact tube and receptacle, said tube having a vertical portion inserted in said receptacle and a horizontal arm inserted in said contact tube, a source of pressurized air connected to said tube, a gasket between said vertical portion and said receptacle, means in said gasket for breaking up and preventing passage therethrough of large particles or agglomerates of said material, and means in said vertical portion for applying a stream of air from said source to said receptacle at an angular direction against the normal surface of the material within said receptacle.

7. A dispenser of the class described, in combination with a contact tube and receptacle containing the material to be dispensed, a tube connecting said contact tube and receptacle, said tube having a vertical portion inserted in said receptacle, and a horizontal arm inserted in said contact tube, a source of air connected to said tube, a gasket between said vertical portion and said receptacle, a screen disposed within said gasket for breaking up and preventing passage therethrough of large particles or agglomerates of said material and means in said vertical portion for applying a stream of air from said source to said receptacle at an angular direction against the normal surface of the material within said receptacle.

8. A dispenser of the class described, in combination with a contact tube and receptacle for holding the material to be dispensed, a tube connecting said contact tube and receptacle, said tube having a vertical portion inserted in said receptacle and a horizontal arm inserted in said contact tube, a source of air connected to said tube, and means in said vertical portion for applying a stream of air from said source to said receptacle at an angular direction against the normal surface of the material in said receptacle, said means comprising a capillary tube angularly disposed within said receptacle and having a tip opening of from 0.04 to 0.05 of an inch and being spaced about $\frac{3}{8}$ of an inch from the bottom of said receptacle.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
156,696	Fichtenberg	Nov. 10, 1874
447,064	Shurtleff	Feb. 24, 1891
478,744	Evans	July 12, 1892
2,185,927	Shelanski	Jan. 2, 1940