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A. C. HOFFMAN

2,191,016

NASAL INHALER

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Fig. 1.

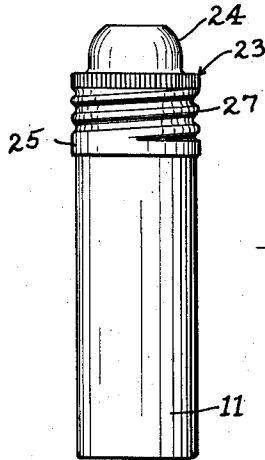


Fig. 2.

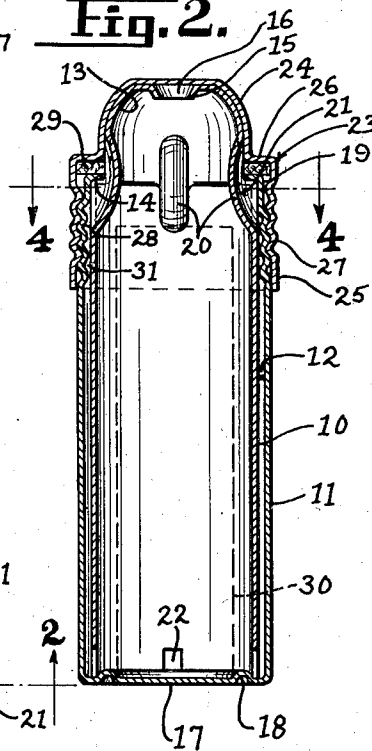


Fig. 4.

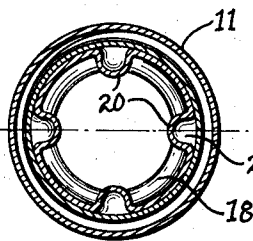


Fig. 5.

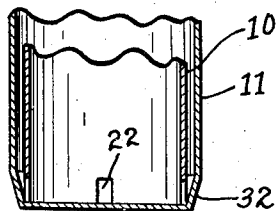
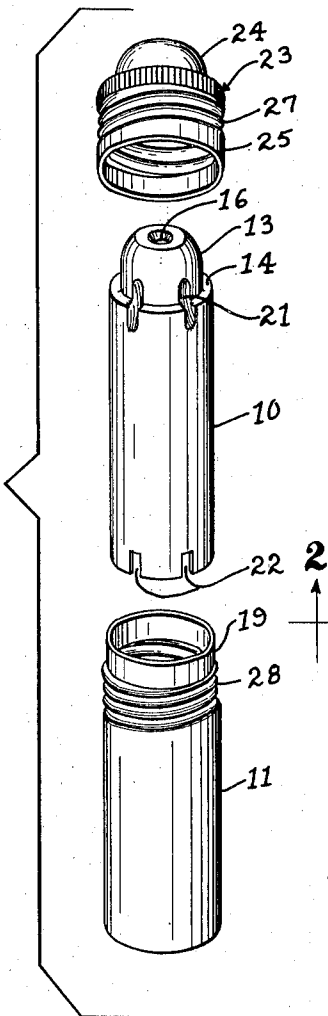


Fig. 3.



INVENTOR
Allan C. Hoffman.
BY
H. F. Johnston
ATTORNEY

UNITED STATES PATENT OFFICE

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NASAL INHALER

Allan C. Hoffman, Milldale, Conn., assignor to
Scovill Manufacturing Company, Waterbury,
Conn., a corporation of Connecticut

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6 Claims. (Cl. 128—200)

This invention relates to new and useful improvements in inhalers, and particularly of the type using a medicated filler or a crystallized or granular substance adapted to produce vapors or fumes for inhalation for the treatment of nose and throat ailments.

One of the objects of this device is to provide a construction which, when a medicated absorbent filler is used, is designed to permit an easy flow of air through the device, subjecting the air to the maximum surface area of the filler so as to saturate it with the volatile fumes emitted therefrom.

A further object of the invention is to provide an inhaler device having air intake and outlet openings in the same end of the device, which construction requires only the use of a relatively short single cap for sealing the same. In producing such a construction, provision is made for an additional annular chamber between two concentrically spaced shells, thus affording additional space for conserving the volatile fumes from the inhalant within the device.

A still further object is to provide an inhalant container of neat appearance, simple and inexpensive construction, easily operated, and designed to be carried in the vest pocket or in the handbag convenient for immediate use.

The invention will be better understood from the detailed description which follows when considered in conjunction with the accompanying drawing, showing certain preferred embodiments of the invention, wherein:

Fig. 1 represents a side elevation of the inhaler.

Fig. 2 is a longitudinal vertical section through the same on a slightly enlarged scale, the section taken on a plane passing through the air intake passages as indicated by the section line of Fig. 4.

Fig. 3 shows an exploded view of the parts of the inhaler as they appear before assembly.

Fig. 4 is a transverse sectional view through the device, taken along lines 4—4 of Fig. 2, looking in the direction of the arrows, and

Fig. 5 is a fragmentary vertical sectional view through the lower end of the container, showing a modified form of construction.

Referring now to the drawing, wherein like numerals designate like parts throughout the several views, the numeral 10 indicates a relatively long hollow interior container shell formed at its upper end and open at the lower end, and adapted to be telescopically received within an exterior body shell 11, the diameters of the shells 10 and 11 being such as to provide for an an-

nular chamber 12 therebetween. The upper end of the interior shell 10 is formed with a reduced rounded nozzle end 13, providing for a transverse shoulder 14 between the side wall of said shell 10 and the nozzle end 13. The nozzle end 13 is designed to conform comfortably to a person's nostril: the apex of the nozzle end 13 is provided with an inwardly drifted conical shaped flange 15 surrounding a discharge aperture 16, which construction presents no sharp edges liable to injure the user.

In order to retain the lower ends of the shells 10 and 11 in concentric relationship, the closed end 17 of the exterior body shell 11 is provided with an upwardly formed annular rib 18 around which the lower end of the interior shell 10 is adapted to fit. The upper end of the exterior shell 11 is provided with a reduced collar or band 19 having an interior diameter adapted to engage the corresponding portion of the upper wall of the interior shell 10, which band 19 in conjunction with the annular rib 18 serves to retain the shells 10 and 11 in spaced concentric relationship. After the two shells 10 and 11 have been assembled together, the upper portion of said band 19 is spun or otherwise formed inwardly to embrace the shoulder 14 and obviously hold said shells 10 and 11 in permanent assembly. It is to be understood here that the above assembly is not effected until after the desired medication is loaded into the interior container shell 11.

As stated as one of the objects of this invention, the inhaler is designed to have the air intake positioned at the upper end of the device in the neighborhood of the outlet or discharge aperture thereof. In accordance therewith a plurality of equally spaced inwardly struck hollow ribs 20 (four in this instance) are provided at the shoulder part 14 of the interior shell 10. The ribs 20 are arcuately shaped in both longitudinal and transverse planes and of a depth exceeding the width of the shoulder 14, thus providing for by-passes 21 communicating directly with the annular chamber 12. The lower edge of the interior shell is provided with a number of rectangular slots 22 to provide an open communication between the chamber 12 and the interior space of the shell 10.

In order to produce an effective seal for the device when not in use, provision is made for a closure cap 23 composed of an upper reduced end 24 shaped to conform to the nozzle end 13, and an enlarged lower cylindrical end 25 with an intermediate connecting shoulder 26. The lower cylindrical end 25 is formed with suitable

rolled threads 27 for engagement with corresponding threads 28 at the upper end of the exterior shell 11 between the collar band 19 and the body proper. An annular sealing washer or gasket 29 is provided and is normally retained within the cup 23 adjacent the connecting shoulder 26 by reason of the fact that the minimum diameter of the thread 27 is less than the outside diameter of said washer 29. When the cap 27 is threaded home upon the inhaler device, the gasket 29 is adapted to be compressed tightly against the shoulder 15 to effect an air-tight seal between the parts. By reason of this construction it will be noted that both the inlet by-passes 21 and the discharge aperture are sealed by a single sealing member and the relative position of the seal is such that the entire chamber capacity of the device is effectively sealed so as to permit substantially no loss of the fumes within the device upon the removal of the cap 23 therefrom.

In making provision for loading or charging the inhalant device with a suitable inhalant, the parts are so constructed as to admit through the open end of the shell 10 a cotton wad 30 or other material of similar characteristics, as indicated by dotted outline in Fig. 2, saturated with the proper inhalant, or alternately an inhalant in crystallized form. After the shell 10 is so charged, it is telescoped into the body shell 11 and the upper portion of the collar band 19 of body shell 11 is spun inwardly over the shoulder 14 of the interior shell 10 permanently locking said shells 10 and 11 together, as previously explained. The closure cap 23 bearing the sealing gasket 29 is then assembled in place, making the container ready for shipment and marketing. Although the threads 28 on the body shell 11 in Fig. 2 appear to contact the adjacent surface of the interior shell 10 in such a manner as to close off the space between the chamber 12 and the by-passes 21, it will be readily understood that a free air passage will be provided to said chamber 12 from the by-passes 21 through the unobstructed helical groove 31 existing as the concave element of the rolled thread 28 in the body shell 11.

In practice, the inhalant device may be readily put to use, by first removing the cap 23, applying the nozzle end 13 to the nostril and inhaling. This causes a flow of air to enter through the by-passes 21, pass downwardly through the annular chamber 12, becoming saturated with the fumes stored therewithin, thence pass inwardly through the slots 22 and upwardly around the medicated wad 30 collecting the fumes emitted therefrom and finally out through the discharge aperture 16 to the nostril. After the inhaler has been used to the extent desired, the cap 23 is replaced upon the container hermetically sealing the same and sealing in the fumes issuing from the medicament to the free space of the container.

In the modification exemplified in Fig. 5, the construction of said inhalant device is similar in every respect to the first form, except that the annular groove 18 is omitted from the base 17 of the body shell 11 and the interior shell 10 is held concentric with respect to the body shell 11 by reason of the fact that the lower end of said latter shell is provided with a slight tapered end 32 which serves to the same effect as the rib 18 in the preferred form without closing off the openings 22.

It will appear that while there are employed

certain details of construction for the purpose of adequately disclosing the invention, various changes and modifications of the construction herein shown and described may be made within the scope of the appended claims without departing from the spirit of this invention or sacrificing its advantages.

What is claimed is:

1. An inhaler device comprising an interior tubular container for receiving a volatile medicament open at one end and the opposite end formed with a reduced apertured nozzle section defining a transverse connecting shoulder therebetween, an outer casing having a closed lower end for closing the open end of said container and of a diameter larger than the container for providing an annular chamber therebetween, means for retaining said container casing in concentric relationship comprising an annular rib formed inwardly of the closed end of said casing and a reduced collar at the upper end of said casing embracing said container, the upper end of said casing above said collar formed inwardly with a flange to embrace said container shoulder in permanent assembly and means providing an air intake passage circumscribed about said shoulder flange and collar and into said chamber, and further means providing communication from said chamber to the interior of said container at the lower end thereof.

2. An inhaler device comprising an interior tubular container for receiving a volatile medicament open at one end and the opposite end formed with a reduced apertured nozzle section defining a transverse connecting shoulder therebetween, an outer casing having a closed lower end for closing the open end of said container and of a diameter larger than the container for providing an annular chamber therebetween, means for retaining said container casing in concentric relationship comprising a tapered section formed inwardly of the casing adjacent the closed end thereof and a reduced collar at the upper end of said casing embracing said container, the upper end of said casing above said collar formed inwardly with a flange to embrace said container shoulder in permanent assembly and means providing an air intake passage circumscribed about said shoulder into said chamber, and further means providing communication from said chamber to the interior of said container at the lower end thereof.

3. An inhaler device comprising two elongated shells disposed one within the other in spaced relationship creating a chamber therebetween, a closure cap carrying a sealing washer, the inner shell having a nozzle end with a discharge opening and which nozzle end is reduced relative to the diameter of the body of the shell to provide a shoulder therebetween, the open end of said outer shell having an inwardly formed flange engaging said shoulder to retain said shells in assembled position after the desired inhalant has been placed into the inner shell, the flange portion of said outer shell also serving as a seat to be engaged by the washer to effect a hermetical seal for the device, and means providing an air inlet into the chamber by-passing the shoulder and flange and further means communicating the opposite end of said chamber into the interior of said inner shell.

4. An inhaler device comprising an inner tubular container having an open end and a nozzle end with a discharge opening, said nozzle

end being reduced relative to the diameter of the body proper of the container to produce an abrupt shoulder therebetween, an outer casing surrounding said container in spaced relationship providing for an annular chamber therebetween and having a closed end for closing the open end of said container, the open end of said casing having an inwardly formed flange engaging said shoulder to retain said casing and container in permanent assembly after the latter has been charged with a suitable inhalant, and means providing an air inlet into the annular chamber by-passing the shoulder and flange, and further means communicating the opposite end of said chamber to the interior of said container.

5. An inhaler device defined as by claim 4 wherein the first mentioned air passage means comprises one or more hollow channels formed inwardly in both the nozzle end and body proper of said container on opposite sides of said shoulder and adapted to circumflex both the shoulder and retaining flange.

6. An inhaler device comprising an inner tubular container having an open end and a nozzle end with a discharge opening, said nozzle end

being reduced relative to the diameter of the body proper of the container to produce a transverse shoulder therebetween, an outer tubular casing surrounding said container and having a closed end for closing the open end of said container, said casing being relatively larger than said container and having means to retain itself in concentric relationship to said container thus providing an annular chamber therebetween, the open end of said casing having an inwardly formed flange engaging said shoulder to retain said casing and container in permanent assembly after the latter has been charged with a suitable inhalant, means providing an air inlet into the annular chamber by-passing the shoulder and flange and other air passage means connecting the opposite end of the chamber into said container, a closure cap having detachable engagement with the upper end of said casing, said cap formed with an intermediate shoulder, and a washer carried by said cap for engaging said flange for hermetically sealing the entire inhaler device.

ALLAN C. HOFFMAN.