United States Patent [19]

Trimble et al.

[54] NASAL PUFF WITH ADJUSTABLE SEALING MEANS

- [75] Inventors: Russell L. Trimble, Overland Park, Kans.; Roger J. Dolida, Kingwood, Tex.; Frederick R. Rose; Philip M. Metzler, both of Overland Park, Kans.
- [73] Assignee: Puritan-Bennett Corporation, Lenexa, Kans.
- [21] Appl. No.: 79,881
- [22] Filed: Jul. 30, 1987
- [51] Int. Cl.⁴ A61M 15/08
- [58] Field of Search 128/207.18, 204.18, 128/207.13

[56] References Cited

U.S. PATENT DOCUMENTS

7,476	7/1850	Lane.
855,439		Clark 128/207.18
1,109,318		Browne et al.
1,162,416		Teter .
1,632,449		McKesson .
2,016,212		O'Connell .
2,122,897		
2,185,997	1/1940	Heidbrink 128/207.18
2,241,535		Boothby et al.
2,245,969		Francisco 128/207.18
2,259,817	10/1941	Hawkins 128/207.18
2,300,273	10/1942	Conneil .
2,376,971		Kleit .
2,408,136	9/1946	Fox .
3,357,428	12/1967	Carlson .
3,362,404	1/1968	Beasley .
3,508,543	4/1970	Aulicono 128/207.18 X
3,584,621	6/1971	Bird et al
3,799,164	3/1974	Rollins .
3,889,671	6/1975	Baker .
4,077,404	3/1978	Elam.
4,151,843	5/1979	Brekke et al.
4,210,174	7/1980	Eross .
4,249,527	2/1981	Ko et al.
4,266,540	5/1981	Panzik .
4,334,533	6/1982	Henkin .
4,354,488	10/1982	Bartos .
4,367,735	1/1983	Dali 128/207.18
•		

FOREIGN PATENT DOCUMENTS

223220 2/1909 Fed. Rep. of Germany .

Patent Number: 4,782,832

[45] Date of Patent: Nov. 8, 1988

WO82/03548	10/1982	PCT Int'l Appl.
WO84/02080	6/1984	PCT Int'l Appl
WO86/06638	11/1986	PCT Int'l Appl
551609	3/1943	United Kingdom .
684788		United Kingdom .
888546	1/1962	United Kingdom .
2147506A	5/1985	United Kingdom .

[11]

OTHER PUBLICATIONS

Martin, R. J. et al., "Acute and Long-Term Ventilatory Effects of Hyperoxia in the Adult Sleep Apnea Syndrome", *Am. Rev. Respir. Dis.* 1982; 125:175-180. Rapaport, D. M. et al., "Reversal of the 'Pickwickian

Rapaport, D. M. et al., "Reversal of the 'Pickwickian Syndrome' by Long-Term Use of Nocturnal Nasa-1-Airway Pressure", *The New England Journal of Medicine, Medical Intelligence*, vol. 307, No. 15, Oct. 7, 1982, pp. 931-933.

Case Reports—"Remission of Severe Obesity-Hypoventilation Syndrome after Short-Term Treatment During Sleep with Nasal Continuous Positive Airway Pressure", Am. Rev. Respir. Dis. 1983:128:177-181.

Sullivan, C. E. et al., "Reversal of Obstructive Sleep Apnea by Continuous Positive Airway Pressure Applied Through the Nares", *The Lancet*, pp. 862-865, Apr. 18, 1981.

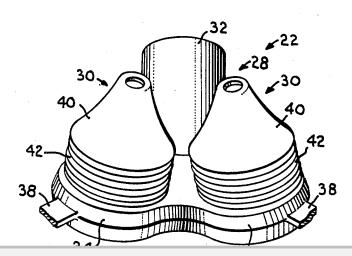
Primary Examiner—Alan Cohan

Attorney, Agent, or Firm—Hovey, Williams, Timmons & Collins

[57] ABSTRACT

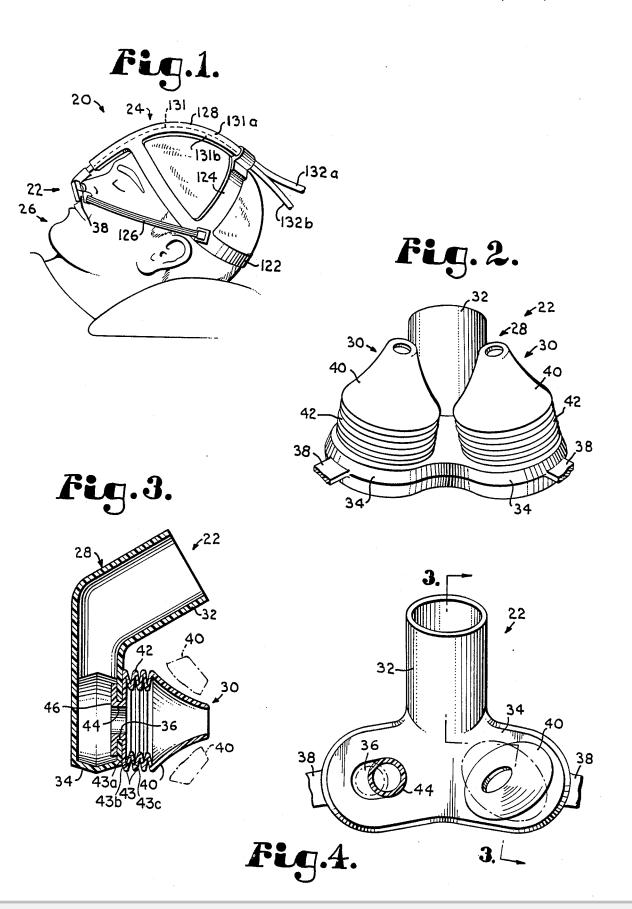
An improved nasal puff assembly is provided which is of particular benefit in the treatment of obstructive sleep apnea and which is characterized by a gas-delivery puff which fits only in the nose of the patient and is therefore of relatively small size and can be comfortably worn. The nasal puff of the invention advantageously includes a plenum chamber having an inlet and a pair of laterally spaced outlets; a pair of soft synthetic resin nares elements or pillows are operatively coupled with the spaced plenum outlets and are designed for ready adjustability so that the effective positions thereof can be altered individually for permitting custom fitting of the nares elements with respect to the nares of different patients. In this way a relatively small number of different sizes of nasal puff can be modified to meet the needs of virtually all patients.

12 Claims, 4 Drawing Sheets



LARM Find authenticated court document

Find authenticated court documents without watermarks at docketalarm.com.



DCKET LARM Find authenticated court documents without watermarks at <u>docketalarm.com</u>.

Δ

4,782,832

Fig.5.

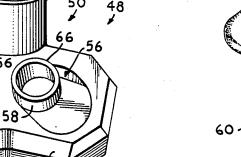
58

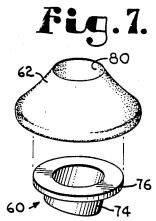
66

54

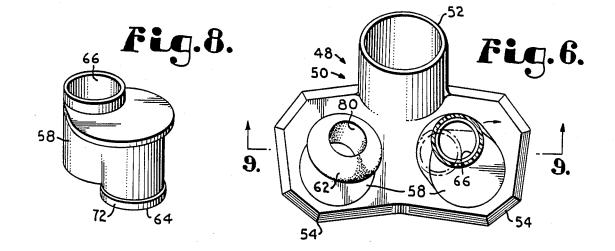
54

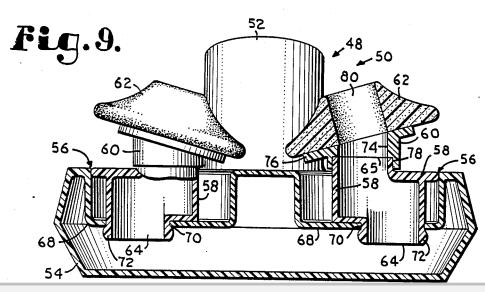
52 50 48





4,782,832

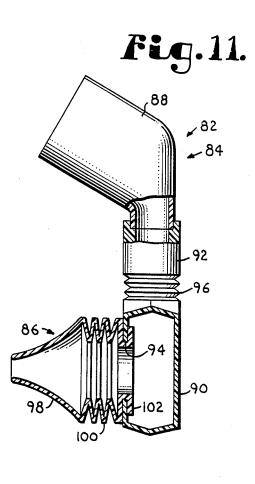


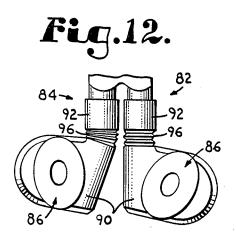


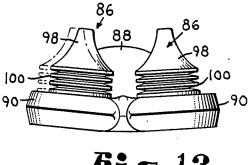


Find authenticated court documents without watermarks at <u>docketalarm.com</u>.

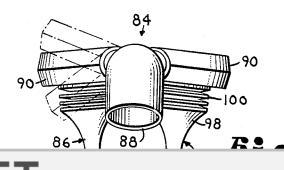
Fig. 10.











Δ

R

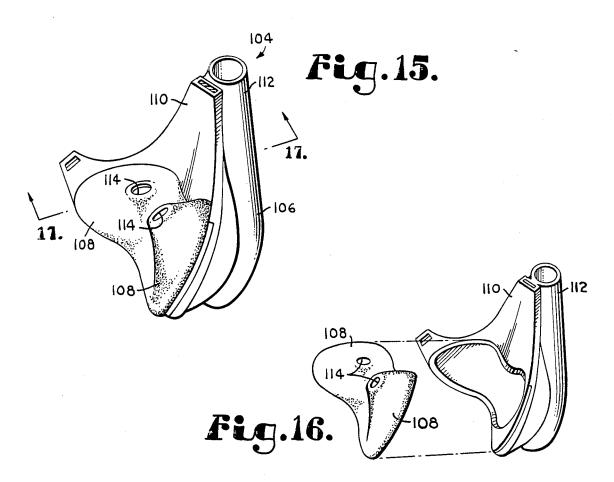
М

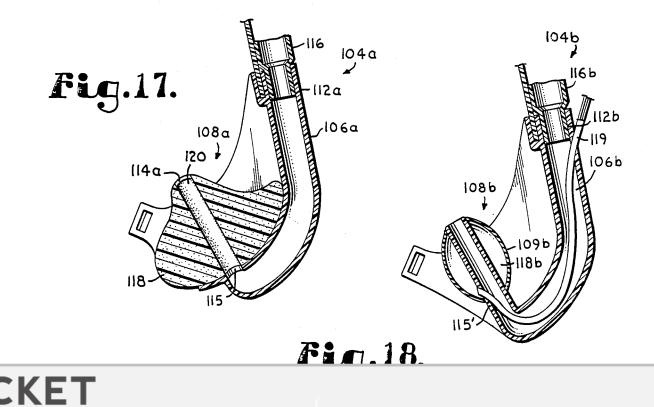
Find authenticated court documents without watermarks at <u>docketalarm.com</u>.

1 1

Δ

R





Find authenticated court documents without watermarks at docketalarm.com.

DOCKET A L A R M



Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.