



US006581594B1

(12) **United States Patent**
Drew et al.

(10) **Patent No.:** **US 6,581,594 B1**
(45) **Date of Patent:** **Jun. 24, 2003**

(54) **RESPIRATORY MASK HAVING GAS WASHOUT VENT AND GAS WASHOUT VENT FOR RESPIRATORY MASK**

5,937,851 A * 8/1999 Serowski et al. 128/205.11
6,112,746 A * 9/2000 Kwok et al. 128/207.13
6,119,693 A * 9/2000 Kwok et al. 128/207.13
6,192,886 B1 * 2/2001 Rudolph 128/207.13

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FOREIGN PATENT DOCUMENTS

AU 712236 4/1999
EP 0697225 A2 2/1996

(73) Assignee: **ResMed Limited**, North Ryde (AU)

OTHER PUBLICATIONS

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

Instruction Brochure for "E-Vent-N" ©Aug. 1997 Dräger Medizintechnik GmbH, 2 pages.

* cited by examiner

(21) Appl. No.: **09/570,907**

Primary Examiner—Aaron J. Lewis

(22) Filed: **May 15, 2000**

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(51) **Int. Cl.**⁷ **A61M 16/00**

(57) **ABSTRACT**

(52) **U.S. Cl.** **128/204.18; 128/207.12; 128/207.13**

(58) **Field of Search** 128/200.29, 201.29, 128/204.18, 205.11, 207.12, 207.13

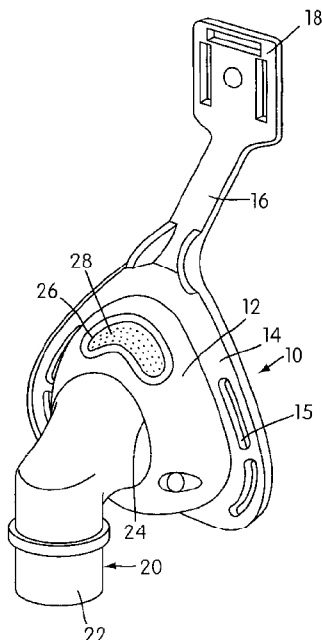
The present invention provides a vent assembly suitable for use with a respiratory mask of the type used in CPAP treatment. In one embodiment the vent is made of a thin air permeable membrane. Generally, the membrane is thinner than 0.5 mm. The membrane can be made of a hydrophobic material such as polytetrafluoroethylene (PTFE). The membrane can also be fabricated from expanded PTFE. The expanded PTFE membrane is mounted on a polypropylene scrim. The pores of the membrane have a reference pore size of 10 to 15 microns. In an alternative embodiment, the vent assembly includes a vent constructed from stainless steel. In another embodiment the membrane has a superficial cross-sectional area of approximately 500 mm². In another embodiment the vent assembly comprises a membrane attached to a vent frame, the vent assembly forming an insert which can be removeably attached to a mask frame.

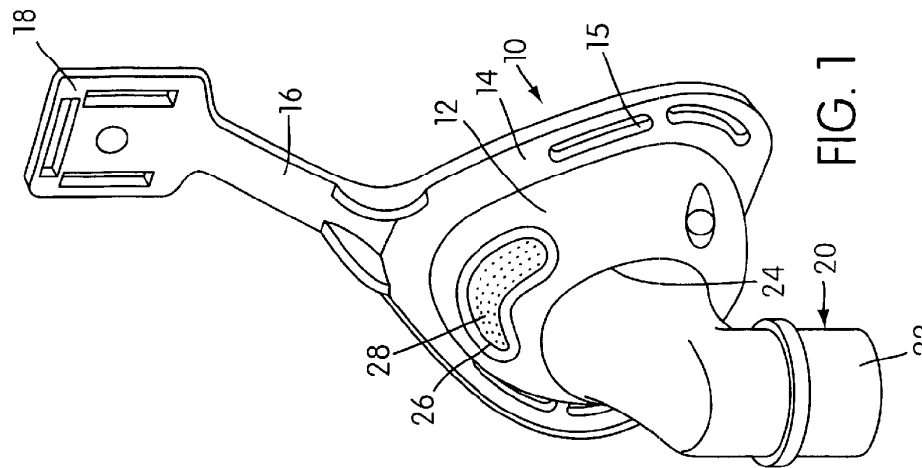
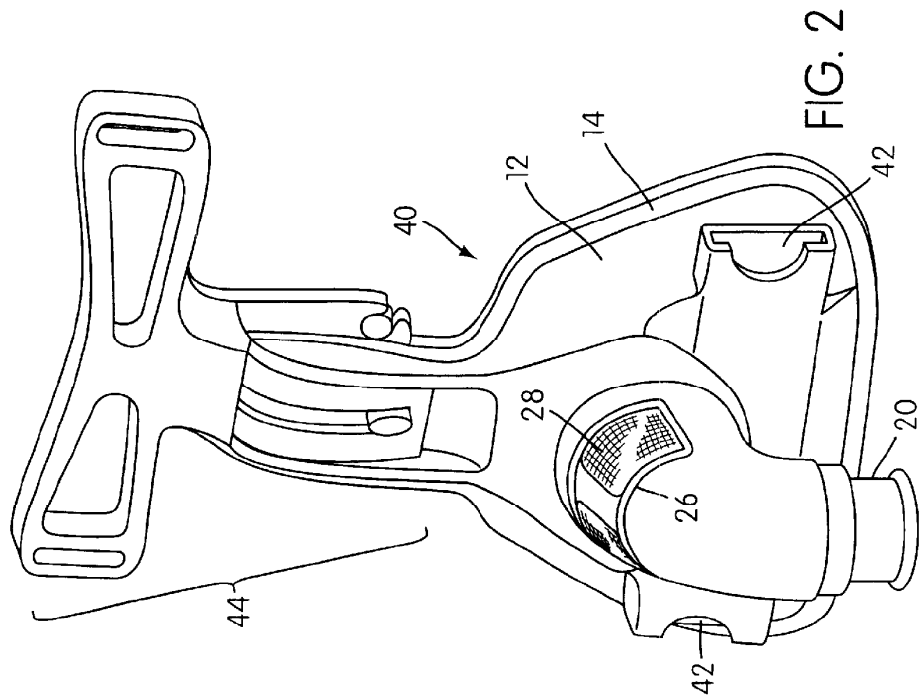
(56) **References Cited**

U.S. PATENT DOCUMENTS

3,291,127 A * 12/1966 Eimer et al. 128/207.15
3,850,171 A * 11/1974 Ball et al. 128/205.11
4,258,710 A * 3/1981 Reber 128/204.18
4,266,540 A * 5/1981 Panzik et al. 128/207.12
5,065,756 A * 11/1991 Rapoport 128/204.18
5,148,802 A * 9/1992 Sanders et al. 128/204.18
5,477,852 A * 12/1995 Landis et al. 128/204.18
5,560,354 A * 10/1996 Berthon-Jones et al. 128/204.18
5,657,752 A * 8/1997 Landis et al. 128/204.18

8 Claims, 4 Drawing Sheets





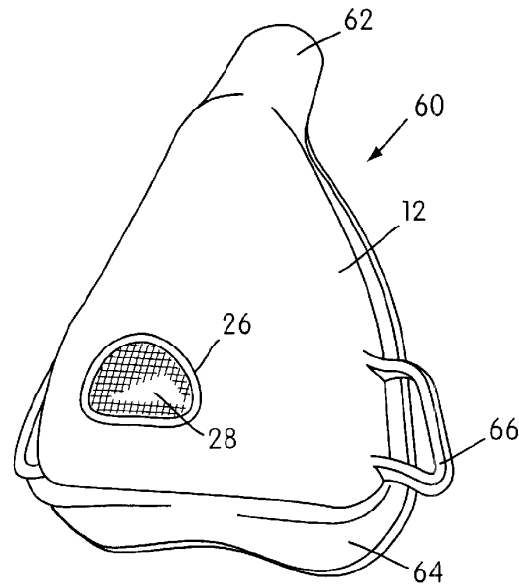


FIG. 3

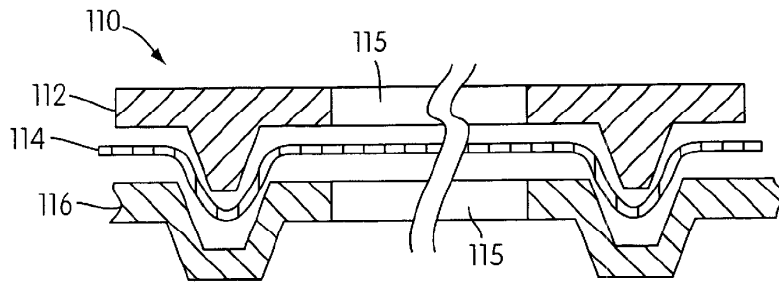


FIG. 4

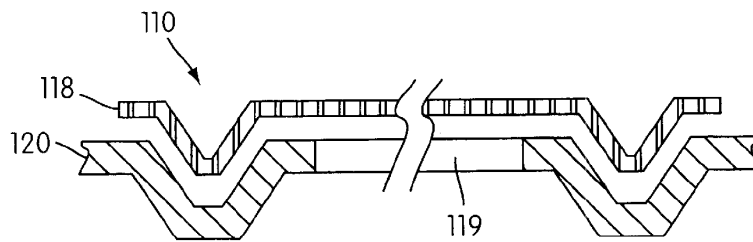


FIG. 5

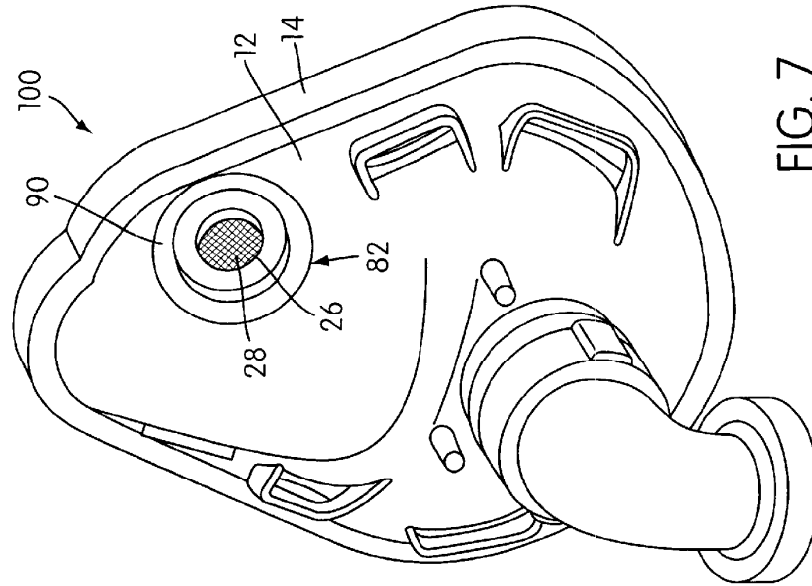


FIG. 7

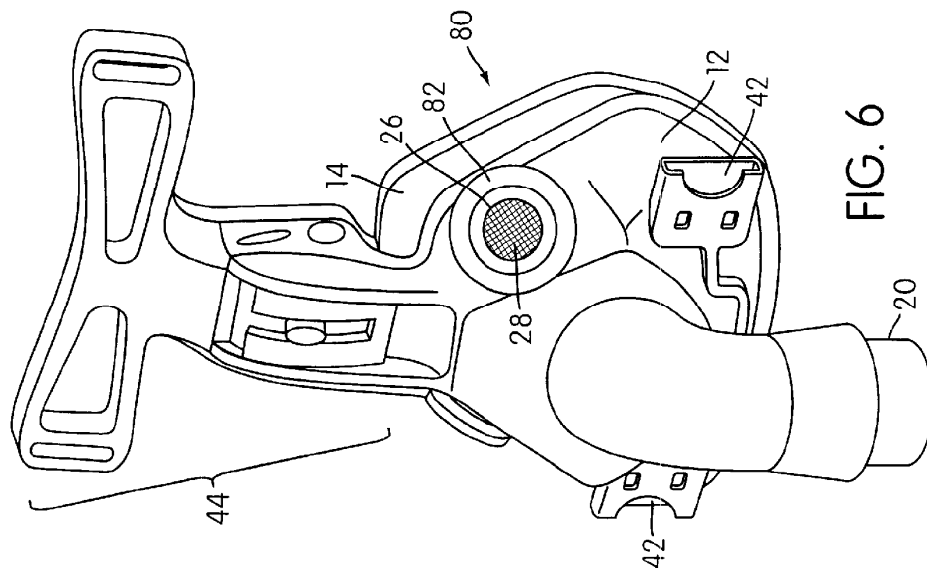
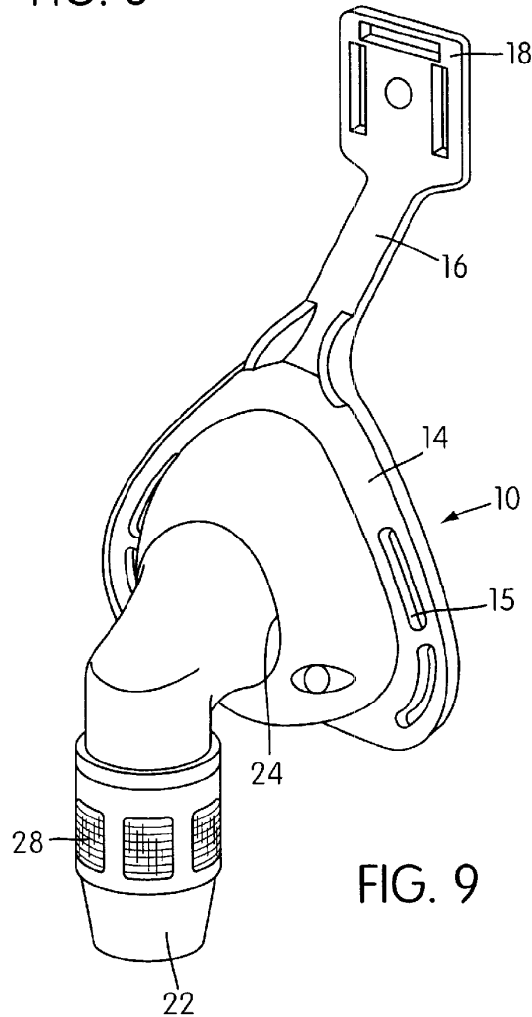
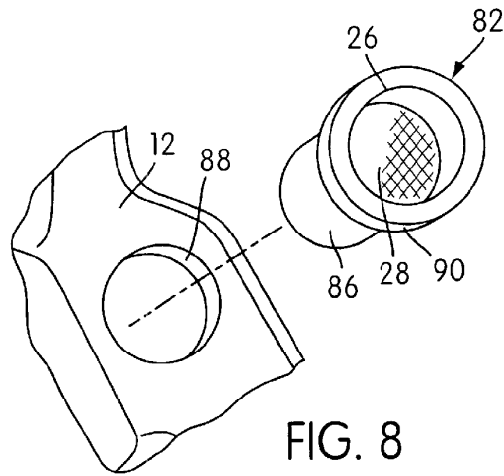


FIG. 6



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