June 14, 1927.

1,632,449

E. I. McKESSON

MASK

Filed July 17, 1924

2 Sheets-Sheet 1

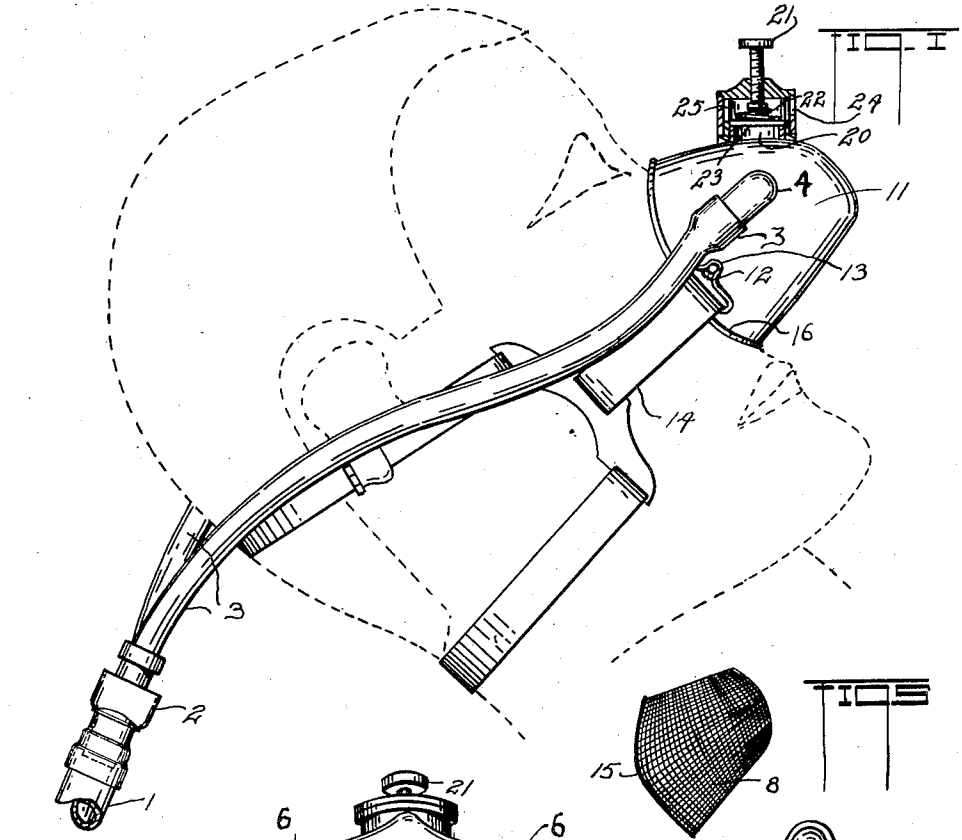


FIG. 1

FIG. 5

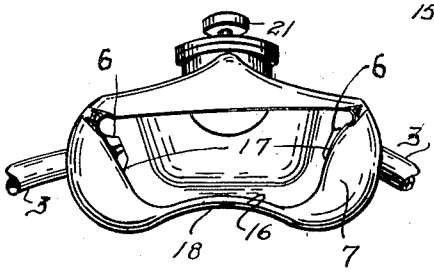


FIG. 2

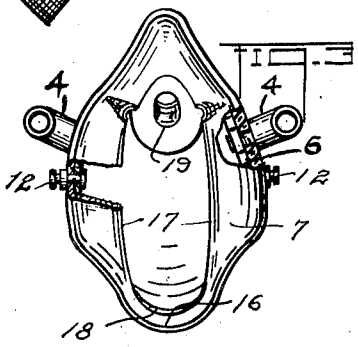


FIG. 3

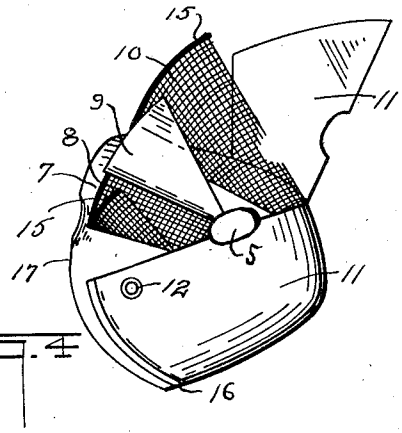


FIG. 4

Elmer I. McKesson

INVENTOR

BY

ATTORNEY

June 14, 1927.

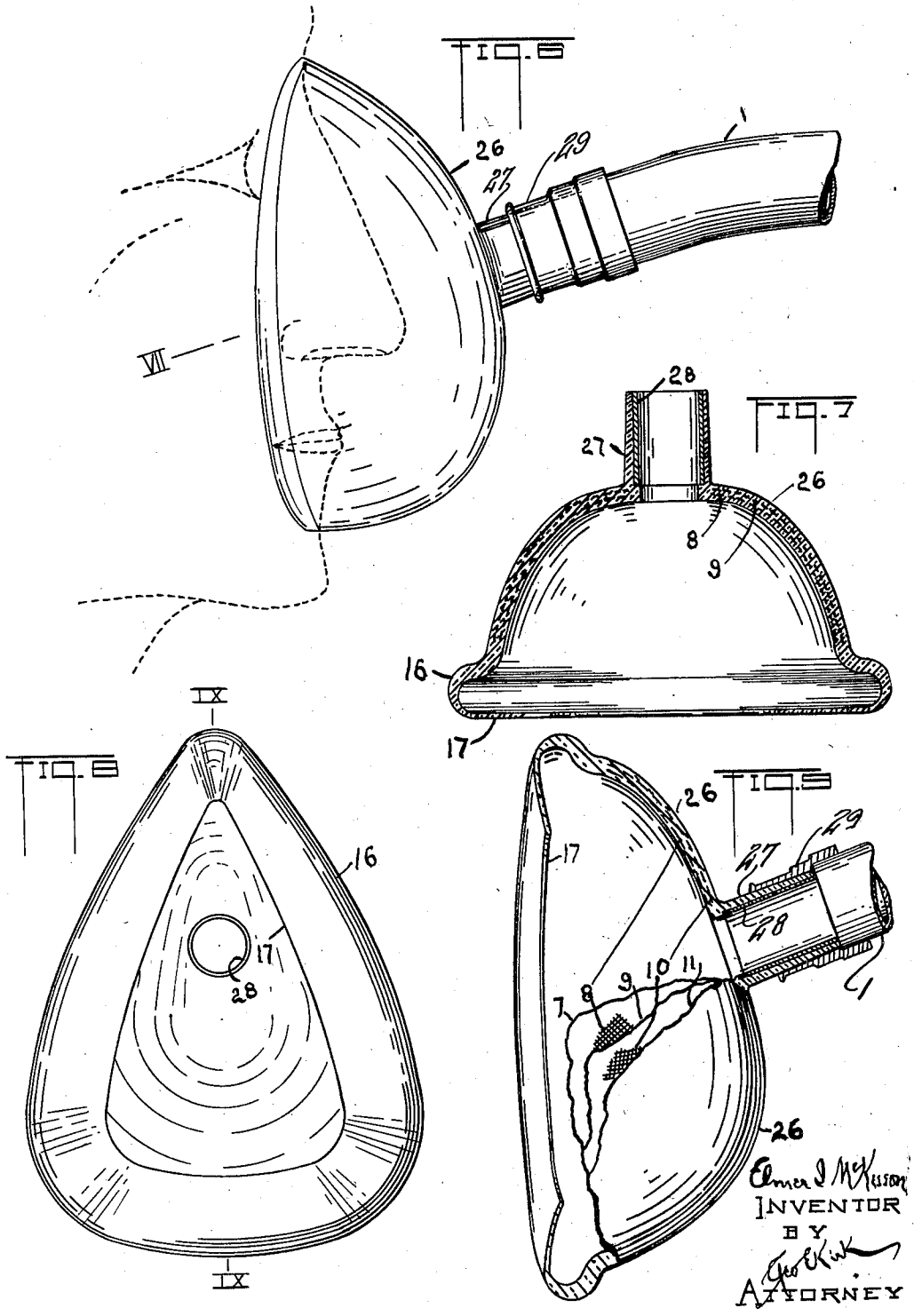
1,632,449

E. I. McKESSON

MASK

Filed July 17, 1924

2 Sheets-Sheet 2



Patented June 14, 1927. 1,632,449

UNITED STATES PATENT OFFICE.

ELMER I. McKESSON, OF TOLEDO, OHIO.

MASK.

Application filed July 17, 1924. Serial No. 726,476.

This invention relates to adaptable articles, semi-stable as to their form, with special self-sealing rim portions.

This invention has utility when incorporated in masks or nozzles which may be readily manipulated or will automatically conform in adapting to varying facial proportions as gas tight fittings for the administration of anæsthetic, restorative, or treatment gases through oral and nasal orifices of patients.

Referring to the drawings:

Fig. 1 is a fragmentary view of an embodiment of the invention as a nasal mask;

Fig. 2 is a view looking into the mask as adapted to a wide nose;

Fig. 3 is a view similar to Fig. 2 with the mask readapted for a narrow nose; parts being broken away to show more clearly the mask opening restricting flap;

Fig. 4 is a side elevation of the masp partially pulled open to disclose the built up structure thereof;

Fig. 5 is a detail view of a wire cloth cup for a mask frame lamination;

Fig. 6 shows an embodiment of the invention in a face mask for fitting over both the nose and mouth;

Fig. 7 is a section on the line VII—VII, Fig. 6;

Fig. 8 is a view looking into the mask of Fig. 6; and

Fig. 9 is a partial section on the line IX—IX, Fig. 8.

A duct 1 as a source of gas supply, say nitrous oxid and oxygen, is shown terminating in Y-fitting 2 having branches 3 therefrom to L-fittings 4 having threaded ends as protruding through openings 5 in the mask walls extending to the mask interior and there engaged by a nut 6 to effect gas tight detechable assembly.

The mask is shown as built up of laminations, preferably rubber and wire cloth. Uncured rubber sheet 7 is placed over a dome shaped form or mold. Perforate or mesh providing metal sheet of wire cloth 8 cupped to approximate the form of the mold is placed over the sheet 7, and the outer mold element is brought into position thereover for cold pressing these two plies into assembly with the rubber to an extent knitting with or entering into the meshes of the cloth 8. Additional ply 9 of rubber is then placed over the sheet 8 and cold pressed, and likewise a second ply 10 of wire cloth over the ply 9 is cold pressed therewith. A final ply 11 of rubber over this outer cloth 10, completes the assembly of the plies of uncured rubber and the metal in building up the mask frame.

With the plies assembled in the frame, the perforations are made for the openings 5, and the mask frame subjected to steam press action for curing.

Studs 12, one for each side of the mask, are riveted in position therewith. These may be engaged by loops 13 of harness 14 to extend about the head of the patient for yieldably holding the mask in the desired position on the patient's face. The twin connections 3 to the mask, render it bi-laterally symmetrical, with no tendency to be twisted away from its location, even though a surgeon or attendant be holding or shifting the patient's head, say during the course of removal of tonsils.

The cups 8, 10, are preferably given a binding 15, say of tape, the so-called friction tape as used in connection with rubber repair work. This gives the wires of the cloth a holding against fraying out, resists working of the wire ends into the rubber and out of the mask walls, and as the plies of the rubber extend slightly beyond the wire cloth cups 8, 10, there is formed a re-inforcing rib, hollow channel or bead 16 about the mask or cup opening, which is restricted by flap 17 from the ply 7. This flap 17 is elastic, normally extending inwardly from the mask opening, and in a nasal mask preferably has a marginal extent coextensive with the nose seating portions, but may be absent at lip engaging portion 18 of the mask, for at this portion the mask may ride up snugly in such fleshy lip portion to effect gas tight sealing.

The mask is shown as having outlet opening 19 to chamber 20 as a metal fitting having set screw 21 adjustable to vary the action of spring 22 resisting the unseating of valve disk 23, thereby allowing exhalation escape by openings 24, 25.

The frame of the mask, notwithstanding it is largely of rubber, is rendered inelastic, though left pliable, while the flap 17 as a mask opening restricting curtain is elastic. The pliable properly of the mask frame permits the mask to be manipulated into widely varying forms in adapting to the many types of faces, and in such adaptation produces a gas tight fitting.

In carrying out the invention hereof for that type of mask which may cover both the nose and the mouth, the cup frame or body may be generally of the type shown for the nasal mask in Fig. 1. In practice, there may not be as much occasion for this type of mask to be manipulated for giving it different forms or shapes although such may be a feature thereof.

Herein, the hollow channel or bead 16 with the flap 17 inwardly therefrom, together coact in producing a structure which when held against the face of the patient will, as to the rib or bead 16, conform generally to the various features of the patient, while the flap 17 inwardly therefrom as distended by the bead 16, readily lies against the skin of the face in a sealing relation. These features, accordingly, give this face mask 26 a range of effective sealing use, even for applying pressure in delivering gases to the patient with a known relationship of the ingredients of such gases, say for anæsthesia, due to the fact that there is no leakage either way about this mask as sealing on the face of the patient.

In practice it may be convenient to have these masks interchangeable, say for infant and adult sizes. To this end, the mask 26 is provided with an extension 27 integral with the body of the mask 26. This extension 27 has molded therein metallic sleeve 28 which may have the tapered rubber thereon provide an easy assembly gas tight friction fitting as a slip joint with tubular extension 29 as a fitting on the duct 1. The flap 17 as extending inwardly from the bead 16, is yieldably held in shape and does not curl on itself or have any curling action whatsoever. This sealing is directly against the face of the wearer as a flat engaging portion.

What is claimed and it is desired to secure by Letters Patent is:

1. A mask embodying a pliable inelastic frame including plies of wire cloth with its warp and woof of overlapping plies angularly offset, said frame having an opening variable by frame manipulation to retain different adjustments, said frame including elastic plies of sheet rubber, one of which extends beyond said frame as an opening restricting flap.

2. A mask embodying a pair of wire cloth cups, a ply of rubber therebetween, and a pair of housing plies thereover, one of said plies extending to form a flap at the cup opening, the other terminating beyond said cups to provide a holding lip directed inwardly from which said flap extends in opening restricting position.

3. A mask having a pliable unitary inelastic body providing an opening, there being a flexible elastic web integral with said body and continuous from both the inner and outer walls of the mask body and inwardly extending from the body at said opening for restricting said opening effective extent, said web being held by the body against curling and in mask use upon the face of a patient being directed by the body into flat adherent position over the patient's face as a marginal seal for the mask.

In witness whereof I affix my signature.

ELMER I. McKESSON.