July 6, 1965 H. L. WEBB ETAL 3,193,624

DICTATION MASK SOUND RECEIVER

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FIG. 1

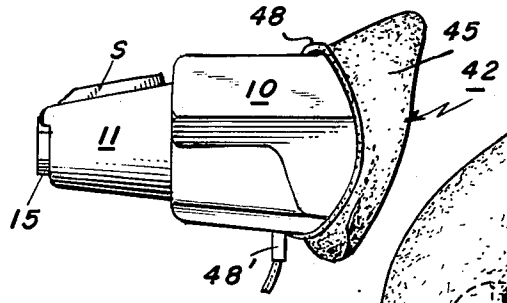


FIG. 2

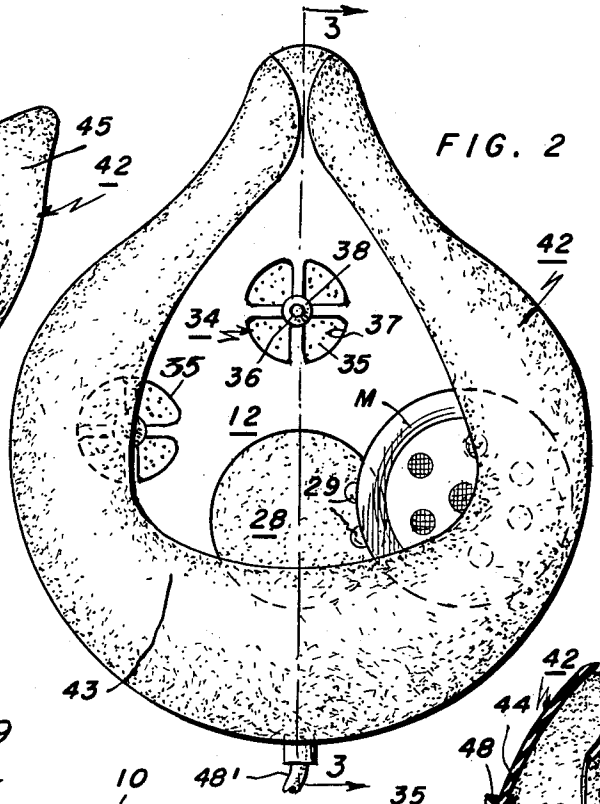


FIG. 4

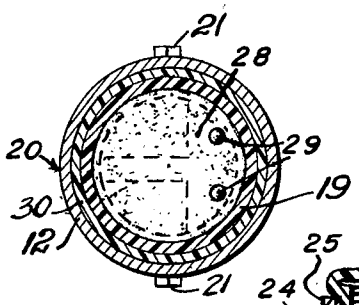


FIG. 3

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FIG. 5

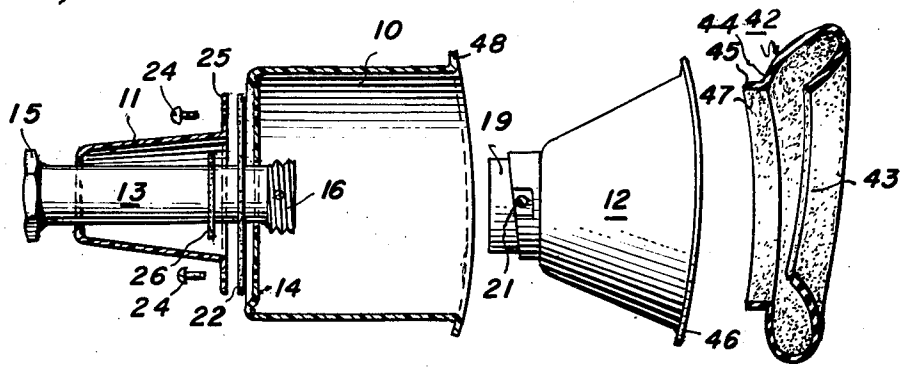


FIG. 8

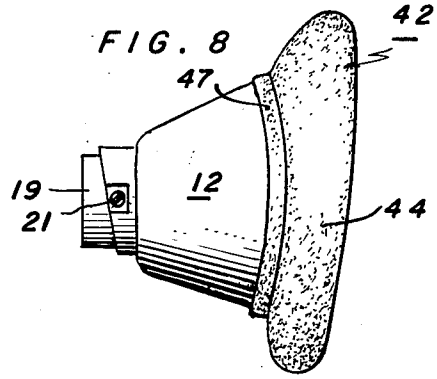


FIG. 7

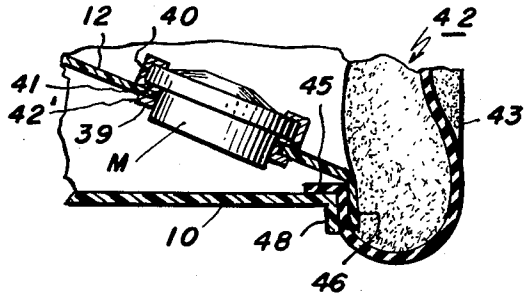
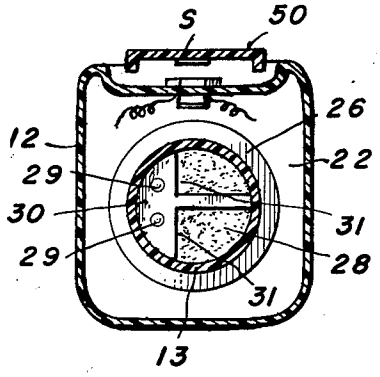


FIG. 6



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DICTATION MASK SOUND RECEIVER

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15 Claims. (Cl. 179—188)

This invention relates to an ambient-sound excluding dictation type mask, sound receiver or transducer such as is employed in electrical dictating machines for "court reporting" or any equivalent, examples being shown in such patents as those issued to us Nos. 2,526,177; 2,572,-547; 2,625,615; 2,830,135 and 2,848,565.

The instant invention structurally simplifies, improves the operation and better integrates and enables assembly and disassembly of the parts for sanitary maintenance; one prime object being to provide for the inhaling of air from the atmosphere outside the mask preferably through the front end of the structure, and thus without the presently required manual effort.

A second object is to produce a novel structure including a casing and separable or masking wall face end therefor, together with means such as an inhalation tube operable to fasten such parts together, and with an associated endless flexible face fitting piece clipped to the marginal edge of the masking wall and extended into the casing to provide a sound excluding joint.

A third important object is to eliminate to the maximum the admixture of indrawn air with exhaled air at the dictation zone of the structure or mask.

Another object is to attain the ends mentioned by providing a passage completely throughout the length of the mask which is large enough to carry the volume of fresh air required by a user during fast dictation, and more specifically to employ a tube to provide such passage in combination with a valve which while permitting rapid and unobstructed inhalation of fresh air therethrough, at the same time prevents the passage of exhaled air or sound thereinto.

It is also aimed to provide a novel valve means operating for the instant escape and dissipation of exhaled air and sound into the casing or housing of the device and exhaust therefrom into the atmosphere, such valve means also preventing the return of exhaled air to the rear or sound input end of the mask, the pressures which adversely affect the action of the diaphragm of the microphone thus being relieved while attaining improved recording.

A further object is to provide a front or switch-mounting section which acts as the hand gripping member for the mask, and at the same time is so disposed as to enable the air input end for the tube to be so positioned as not to be obstructed in any manner by the hand or fingers supporting the mask.

Various additional objects and advantages will become apparent from a consideration of the description following, taken in connection with the accompanying drawings, illustrating an operative embodiment by way of example.

In said drawings:

FIG. 1 is a side elevation of my improved ambient sound-excluding transducer;

FIG. 2 is an enlarged rear end elevation thereof;

FIG. 3 is a longitudinal sectional view taken on line 3—3 of FIG. 2;

FIG. 4 is a cross-section taken on line 4—4 of FIG. 3;

FIG. 5 is a blown-up view taken on a smaller scale partly in longitudinal section and partly in elevation and more or less diagrammatically showing the detachability of the parts comprising the improved maks or transducer;

FIG. 6 is a cross-section taken on line 6—6 of FIG. 3;

FIG. 7 is a fragmentary section through parts of the casing and the face engaging diaphragm showing the mounting of the microphone by the latter; and

FIG. 8 is a side elevation showing the face-engaging end wall or diaphragm with the face clipped in place thereon.

Referring specifically to the drawings wherein like reference characters designate like or similar parts thoughout the different views of the improved mask, receiver or transducer, **10** designates the main section of a suitably shaped housing or casing, and **11** represents an auxiliary section of such housing or casing. At the face or rear end of section **10** is a face masking wall structure **12**. Parts **10**, **11** and **12** are separable and usually rigid and of metal or plastic. Said sections are disposed on an air intake tube **13**, usually of plastic to minimize condensation and open at both ends, and which is of a bore admitting sufficient air for fast dictation. Said tube is detachably disposed centrally of the sections **10** and **11**, being applicable and removable axially through the large central opening **14'** of an end wall **14** at the front end and integral with section **10**. Said tube **13** at its front end is provided with a knurled head or knob **15** which may be integral therewith, screw-threaded or in any wise fastened thereto while at its rear end are exterior screwthreads **16** usually of plastic which are screw-threads **17** of a plastic or metal coupling sleeve **19**. Sleeve **19** telescopes partly into a central annular neck **20** of the masking wall **12** and is secured thereto by fastenings **21** for limited pivotal movement to aid in registery of the screw-threads **16** and **17** and ease of adaptation of all of the parts, particularly the plastic and flexible ones in assembling and disassembling the structure.

A soft rubber or equivalent sheet gasket **22**, substantially coextensive with wall **14** is fastened in place against that wall as by a flange **25** of section **11** and screws **24** passing through that flange **25** and into that wall **14**. Gasket **22** has and opening **18** aligned with opening **14'** through which tube **13** passes. Another soft rubber or equivalent gasket ring **26** is slidably held on the tube **13** through dilation of its open center and is of a size to overlap the adjacent portion of gasket **22** to well prevent leakage of sound through said opening **14'**.

Adjacent said masking wall **12** in order to alternately permit inhalation and exclude exhalation through said tube **13**, a thin normally closed diaphragm or disk valve of elastic rubber or any other suitable material **28** is provided. This valve as shown is fastened at one portion in any suitable manner as by rivets **29** to a usually flexible supporting disk **30** marginally attached to the adjacent end of either sleeve **19** or tube **13**. Disk **30** has a plurality of openings **31** therethrough and an exhaust opening **32** is provided in the cylindrical wall of casing section **10** and the same is preferably covered by a replaceable porous filter **33** of any suitable construction.

One or more openings **34** are provided through the masking wall **12** so that the exhaled air and sound may pass into the interior of section **10** and eventually escape therefrom through filter **33** and exhaust opening **32** into the atmosphere.

Associated with each of the openings **34** is a normally closed rubber or other flexible valve disk **35**, which functions to automatically close during inhalation and open upon exhalation by the user. Such valve disks **35** may be fastened in any suitable manner to masking wall **12** as by the passage of integral shanks **36** extending centrally therefrom through openings **37** in masking wall **12**, which shanks carry compressible rubber or other heads **38** which may be squeezed through such openings **37**, and then expand into the position shown in the drawings in order to retain them in place.

A microphone M is also detachably mounted in an opening 39 of masking wall 12. Such microphone is positioned in a groove 40 of a contractile rubber or equivalent ring 41 which includes an L-shaped wall 42' which removably grips masking wall 12 about the opening 39.

An elastic, usually rubber, face contacting piece 42 is detachably fastened marginally of the masking wall 12 and casing section 10, and it is to be noted that such masking wall 12 and face piece are of a configuration preferably best conforming to the contour of the face of a user of the device.

Such face piece 42 is endless and generally U or V-shape in cross-section as engaged with the user's face having a free inner distal flange 43 to directly yieldably fit the user's face. The other flange 44 has an inwardly extending lip or shoulder 45 whereby, in assembly, the face piece may be stretched or dilated over and by contraction be retained on an outwardly extending marginal flange 46 of the masking wall 12 as well shown in FIG. 8. Thus coupled the face piece and wall 12 as a unit as seen in FIG. 8, are positioned on the rear end of casing section 10 with a lip or shoulder 47 of the face piece extending into said section 10 and the adjacent portion of wall 44 contacting an outwardly extending marginal flange 48 on section 10. Thus upon securing threads 16 and 17 together, the parts are assembled. Tightening of the tube 13 at such threads compresses the rubber at and adjacent lip or shoulder 45 to provide a dust and sound-proof joint.

A cable 48' extends into the interior of section 10 through a grommet of insulation 49 secured in a suitable opening of the main wall of casing section 10, the cable having conductors adapted to be connected to a suitable source of electrical energy (not shown) and appropriately wired to the microphone M and to a control switch S either normally open or normally closed as preferred, insulated from and secured in the top wall of the auxiliary casing section 11. Such switch S may be of any suitable type, and for example has a depressible button 50 which is spring-urged upwardly at 51.

It will be realized that practically all of the parts, especially the main parts, may be made of any suitable plastic material, although they may be manufactured of metal or otherwise.

Presuming use of the device, the auxiliary casing section 11 is adapted to be gripped by one hand or any number of fingers. The control switch S for the microphone M and the associated dictating machine is normally open or closed according to the type of switch it is preferred to use, and in a position to be depressed by one or more fingers of the said hand so as to move the button 50 to the appropriate closed or open position. With the face piece 42 engaged with the face of the user, the latter dictates as usual to the exclusion of ambient air. During such dictation, an adequate supply of fresh air from the atmosphere is automatically drawn from the front directly through the air intake tube 13 past valve 28 to the face of the user by inhalation, and as the user exhales such valve automatically closes and seals off the inner end of the tube. Also during such use as the user exhales, the exhaling valves 35 will automatically open, permitting exhalation through openings 34, filter 33, and exhaust opening 32, said exhalation valves 35 being normally closed and automatically closing and sealing the openings 34 against any intake of exhaled air from the interior of section 10.

The apparatus is adapted to be opened for sanitation and maintenance purposes by simply unscrewing the tube 13 until the entire facepiece assembly 12–42 is free of the casing. The casing is then open for replacement of any absorbent tissues employed and general cleansing. The same procedure is followed when replacing the facepiece assembly. The facepiece is easily removed, discarded, and replaced.

It is to be borne in mind that all the gaskets, such as 15', 22, 26 and 45 seal the joints of which they form part against both air and sound, and that when the valves 28 and 35 are in closed position, they also seal the associated parts against passage of both air and sound.

Various changes may be resorted to within the spirit and scope of the invention.

We claim:

1. A mask for a sound transducer including a generally tubular rear casing section with a closure wall at its front end and provided with an opening, a generally tubular masking wall structure located at said rear end, a face fitting piece disposed marginally of the rear end of said masking wall structure having a portion functioning as a gasket interposed between the rear casing section and the margin of the masking wall structure, a longitudinal inhalation tube extending through said opening, a front casing section fastened against said closure wall and through which said tube extends, means detachably interconnecting the tube within the rear casing section to said masking wall structure, and exhalation outlet means through said masking wall structure.

2. A mask for a sound transducer according to claim 1 wherein the detachable interconnection of the tube with the masking wall structure is flexible to facilitate registration and connection of the parts in assembly.

3. A mask for a sound transducer according to claim 1 wherein said tube is of plastic to minimize condensation.

4. A mask for a sound transducer according to claim 1 wherein said tube is screw-threaded to said masking wall structure.

5. A mask for a sound transducer according to claim 1 wherein the detachable interconnection of the tube with the masking wall structure comprises a sleeve flexibly mounted on said masking wall structure, and screw-threads between the sleeve and tube.

6. A mask for a sound transducer according to claim 1 and gasket means over said opening contacting said tube and the front end of the rear casing section.

7. A mask for a sound transducer according to claim 1 and gasket members overlapping one another and one contacting said tube and one contacting the front end of the rear casing section.

8. A mask for a transducer including a first generally tubular casing section, a generally tubular masking wall structure on said section for disposition at the face of the user, means for exhalation through said masking wall structure, a hand gripping auxiliary casing section, an inhalation tube removably extending through the latter section and into the first section, means operatively positioning said auxiliary casing section with respect to the first casing section including a head on said tube spaced from the first casing section and in abutment with the said auxiliary section, and means removably connecting said tube and masking wall structure and securing the latter to the first casing section.

9. A mask for a transducer including a casing provided with an end wall and an open end, an inhalation tube extending into the casing through said end wall, a generally tubular masking wall structure at said open end for location at the face of the user, exhalation means through the mask, a face-fitting piece surrounding said open end having a portion interposed between the margin of said masking wall structure and adjacent surface of the casing serving as a gasket, and means detachably securing and drawing said tube and masking wall structure together which clamps said portion against said surface.

10. A mask for a transducer including a generally tubular casing provided with an end wall an an open end, a generally tubular masking wall structure disposed across said open end for disposition at the face of the user, exhalation means through said structure, a face-fitting piece surrounding said open end having a portion serving as a gasket interposed between the margin of said structure and the adjacent surface of the casing, and

an inhalation tube extending generally longitudinally and centrally of the casing and into the latter through said end wall, and means operating through relative rotation of the tube and masking wall structure at a location within the casing and detachably securing the tube and masking wall structure together with the latter clamping said portion against said surface.

11. A mask for a sound transducer including a generally tubular casing comprising front and rear sections, a generally tubular masking wall structure at the rear end of said rear casing section disposable at the face of the user and having provision for exhalation therethrough, said front section being a hand-gripping construction, an inhalation tube means extending longitudinally through said sections and deteachably securing them together, said tube means extending through said front casing section and into the rear casing section at the end opposite said masking wall structure, a head on said tube means for abutment against said front section, and means operative to secure the masking wall structure and the casing and tube means together through the turning of the latter.

12. A mash having a sound transducer including a generally tubular rear casing section open at one end and having a closure wall at its opposite end provided with an opening therethrough, a generally tubular masking wall structure at said open end, a face-fitting piece disposed marginally of said masking wall structure having a portion forming a gasket interposed between said casing section and the margin of the masking wall structure, an inhalation tube extending through said opening and terminating within said rear casing sections, a head on the front end of said tube, a front casing section located between said rear casing section and head through which said tube passes, means operable through relative rotation of said tube fastening said front casing section against said closure wall, means at a location within the rear casing section detachably interconnecting through relative rotation the tube and masking wall structure, and

exhalation outlet means through said masking wall structure.

13. A mask for a sound transducer including a generally tubular casing open at one end with a surrounding marginal wall at that end, a generally tubular masking wall structure located at said end of the casing, an elastic face-fitting element stretched onto the margin of said masking wall structure to position it thereon for unitary application with the latter to the casing, and tubular means detachably interconnecting said masking wall structure to the casing with the stretched portion of said element clamped between said marginal wall of the casing and the masking wall structure to serve as a gasket.

14. A mask for a sound transducer according to claim 13 wherein the detachable interconnection of the tubular means with the masking wall structure comprises a sleeve flexibly mounted on said masking wall structure and screw-threads between the sleeve and tubular means.

15. A mask for a sound transducer according to claim 13 wherein the detachable interconnection of the tubular means with the masking wall structure comprises a sleeve flexibly mounted on said masking wall structure, screw-threads between the sleeve and tubular means, and gasket means over said opening contacting said tubular means and the front end of the rear casing section.

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