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H. L. WHITTAKER ET AL

2,080,552

TELEPHONE MOUTHPIECE ATTACHMENT

Original Filed Feb. 26, 1934

Fig. 1

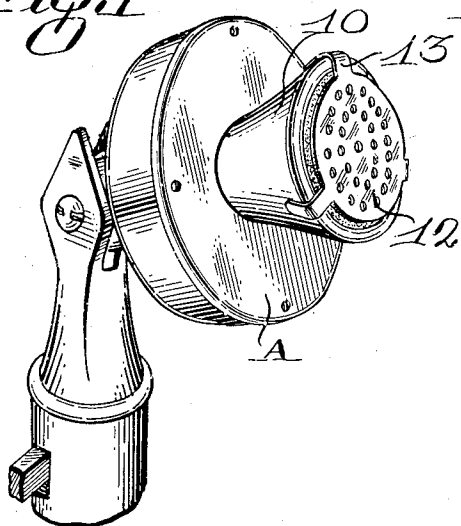


Fig. 3

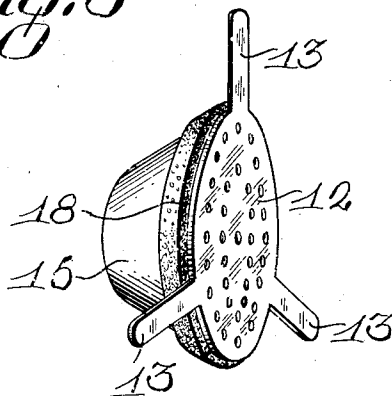


Fig. 2

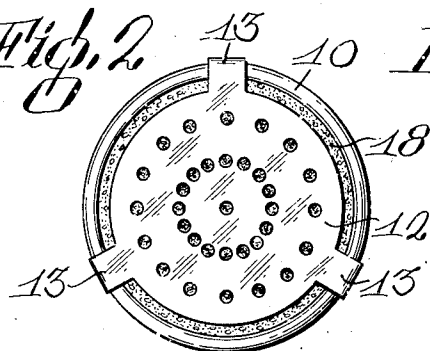


Fig. 5

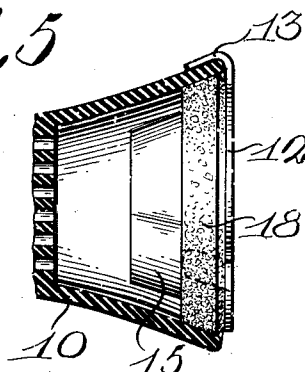
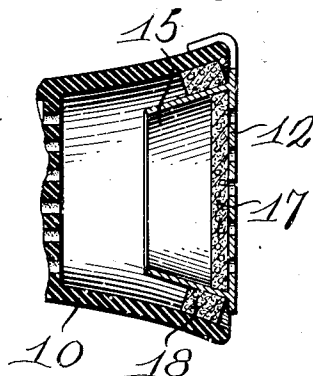


Fig. 4



Inventors
Harry L. Whittaker
William H. Hurford
By *Raymond C. Robi* Attorneys

UNITED STATES PATENT OFFICE

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TELEPHONE MOUTHPIECE ATTACHMENT

Harry L. Whittaker, Ville La Salle, Quebec, and
William H. Hurford, Montebello, Quebec,
Canada

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5 Claims. (Cl. 179—187)

The present invention relates to an attachment for telephones, and more particularly to a device attachable to the mouthpiece for the purpose of facilitating conversations.

It is well known that background noises greatly affect the clarity of telephonic communications, especially in the case of noisy surroundings such as a machine shop, busy office, stores and the like.

It is known also that these noises affect clarity both at the reception and transmission ends, due to the fact that these disturbances are picked up by the microphone and transferred to the receivers at both ends of the telephone line.

In fact, it has been proved that conversations may be carried out satisfactorily, even among very noisy surroundings, if the microphone at the noisy end be disconnected or otherwise rendered inactive by means of a foot switch, for example. Furthermore, the usual booths have been provided primarily to isolate these noises, besides insuring privacy.

A study of the problem by the applicants has disclosed the fact that, as might be expected, the annoying background noises are mostly comprised of high-frequency sounds much above the frequencies comprised within the scale of the average human voice. Therefore, the problem lay in filtering these undesired vibrations exclusive of the useful voice frequencies.

Although similar requirements are easily met in electrical circuits by means of traps and condensers, such devices in the case of telephones were out of the question, primarily because it would be materially impossible to convince the companies to change, or alter, their present equipment, and also because it was desired to produce an attachment applicable to existing material at a cost exceedingly low, and in the simplest possible manner.

Thus, the problem resolves itself to one of mechanical solution, if possible.

The present invention provides means satisfactorily meeting the requirements of a device for eliminating background noises, which device can be attached easily to an ordinary telephone, the cost being negligible.

Briefly, the invention consists in the provision of means disposed in front of the telephone mouthpiece, to filter the sounds impinging on the microphone diaphragm.

Thus, cork has been found eminently successful in its properties of absorbing high frequencies normally above the scale of the human voice. Other materials, of course, can be used with sat-

isfactory results, such as matted and rubber-loaded felt, pulp-board, etc.

However, the use of such an absorbing pad alone, in front of the mouth-piece, does not quite solve the problem in that the sound-absorbing properties of these materials are not defined sufficiently well. In other words, the high frequencies are very well dispensed with, but a good portion of the lower frequencies comprised within the human voice scale are also absorbed. The result is that the human voice is greatly distorted and talking must be conducted in much louder tones.

To obviate this difficulty, it has been necessary to devise means to carry directly through the absorbing pad a certain amount of audible frequencies, by means of a metal, for instance, or other sound conductor of suitable characteristics.

With this purpose in mind, a metal member has been added to the attachment to act as a sound conductor and baffle. This member is secured directly to a base plate acting as a supporting member for the absorbing pad. The characteristics of this plate must be chosen so that its natural period of vibration is below the lower portion of the human voice scale.

As an example, an attachment according to the invention is shown in the attached drawing, wherein:

Figure 1 is a perspective view of the device attached to a telephone mouthpiece,

Figure 2 is a front view of the attachment in place on the mouthpiece,

Figure 3 is a perspective view of the device alone, before bending at the attachment lugs,

Figure 4 is a sectional view through the device and mouthpiece, and

Figure 5 is a sectional view through the mouthpiece only, showing the method of attachment.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the letter A generally designates a conventional telephone transmitter having the usual belled mouthpiece 10 connected therewith.

The attachment constituting the present invention embodies a base plate 12, in the present instance in the form of a perforated flat metallic disc provided at the periphery with a plurality of radial prongs or ears 13 disposed to be bent over the rim of the mouthpiece to secure the device in position. This plate or disc 12 is made of a dense metal such as copper which has been found to give excellent results. As stated previously, the metal chosen should be of a thick-

ness and have characteristics, such that undesirable periodic vibrations be prevented within the scale of the human voice. Since the number and size of perforations has a direct bearing on the fundamental vibration period of plate 12, it is evident that thickness alone is not a limiting factor. Thus, thickening of the plate, or increasing the number and size of apertures, achieves the same result. Therefore, a certain experimentation is necessary to obtain the required properties. A plate approximately $\frac{3}{8}$ of an inch thick, however, and perforated substantially as shown in Figure 2 should give good results.

At the inner face of the disc 12 is formed a frustoconical flange 15 constituting a directing or baffle member and acting as retainer for the absorbing means.

Against the inner face of the disc 12 is positioned an absorbing pad 17 preferably comprising a disc formed of cork or other material suitable to absorb high-frequency background noises during the operation of the telephone.

A packing ring 18 which may also be formed of cork or other yielding material is disposed about the base of the flange 15 and snugly fitted between the flange and the outer portion of the telephone mouthpiece 10, in order to effect a tight closure and to prevent metal-to-mouthpiece contact.

Thus, it will be evident that the device of the invention is simple and is based on theoretically correct principles. In practice, the tests conducted have amply proven the capabilities of the attachment to filter all sounds above a given maximum and to facilitate intelligent conversation in noisy surroundings.

As an example, a test may be mentioned of a telephone conversation held over a country line of several miles length, at which time a grocery order involving twenty items was given without a single repeat, while a phonograph was playing at good volume at a distance from the telephone of less than six feet.

It is to be understood that the form of our invention herein shown and described is to be taken as a preferred example of the same, and that various changes as to the shape, size and arrangement of parts may be resorted to without

departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described our invention, we claim:—

1. An attachment for the mouthpiece of a telephone comprising a base plate having means for securing the same to the outer end of a telephone mouthpiece and provided with apertures, a high-frequency sound cutting off pad secured against the inner face of the base plate, and vibratory means extending through said pad from the base plate.

2. An attachment of the character described comprising a base plate having perforations and means to secure the same to the outer end of a telephone mouthpiece, a cork pad secured against the inner face of the base plate, and a sound conducting member secured to the plate and extending through the pad.

3. An attachment of the character described comprising a base plate having perforations and securing means for a telephone mouthpiece, said base plate being comprised of a soft metal such as copper and the thickness of which and perforations thereof being calculated to lower the natural vibration period thereof below the frequency scale of the human voice, a sound absorbing pad against said plate, and an extension member on the plate extending through said pad, inwardly.

4. An attachment for the mouthpiece of a telephone comprising a perforated rigid disc, ears formed at the edge of the disc for detachably connecting the same to the outer end of a telephone mouthpiece, a frustoconical flange projecting inwardly from the inner face of the disc, a pad of high-frequency sound absorbing material secured against the inner face of the perforated disc, and a packing ring snugly fitted between the exterior of the flange and the outer end portion of the mouthpiece.

5. In combination with a telephone mouthpiece, a perforated plate, a high-frequency-sound absorbing pad mounted against said plate, and a metallic member extending through said pad in order to transmit therethrough frequencies comprised within the scale of the human voice.

HARRY L. WHITTAKER.
WILLIAM H. HURFORD.