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ADHESIVE DENTURE AND RETAINING FILM

Robert W. Rothrock, Columbus, Ohio

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This invention is concerned with the provision of an improved unsupported flexible film or sheet adapted for employment in the mouth of a user between artificial dentures and the natural mouth tissues on which such dentures bear for the purpose of protecting the tissues from injury and to maintain the dentures in fixed positions in the mouth.

A particular object of the invention is to provide an inexpensive, simple and improved means for avoiding discomfort on the part of those using removable dental plates and other dentures, particularly discomfort resulting from pressures caused by direct bearing and rubbing of such plates or dentures on the mouth tissues.

Removable partial and complete dentures having hard unyielding bodies composed of vulcanized or polymerized plastic compounds are shaped approximately to conform with the gingival and roof tissues of the mouth. To cause such dentures to conform to the configuration of the mouth regions in which they are to be used is difficult, and complete conformity of the dentures to the shape of the mouth and precise security or fixity in position on the part thereof is to a very large degree unobtainable. As a result of this condition the dentures frequently bear on localized portions of the gum tissue, so that with movement of the dentures, as caused in food mastication, and from other causes, the dentures or plates will rub or chafe the mouth tissues, producing in many instances acute discomfort, soreness and other undesired conditions. Again, even though gum discomfort is not present, the dentures or plates often fit so loosely in the mouth as to possess objectionable movement which is the source of noises often referred to as "chattering," and more particularly reduces the functional efficiency of mastication and therefore deglutition and digestion as well.

These conditions have been recognized and many efforts have been made heretofore to correct or alleviate the same. Thus it has been proposed to use various powdered gums of an adhesive character in retaining the dentures against movement while in the mouth. These gums are usually sufficiently soluble or become degraded in the presence of the mouth fluids and, following a relatively short period of use, the same become diluted in the mouth fluids and are swallowed. Again, it has been proposed to employ fabric or rubber cushions or pads between the dentures and the gum ridges. These cushions or pads are objectionable because of their thickness or bulk and the tendency thereof when wet to pack and form yielding lump-presenting bodies.

The present invention, therefore, aims to provide a means for overcoming these and other objections present in prior methods and devices by providing an unsupported dry sheet or film of a freely flexible, remoistenable, tough and cross-sectionally thin character, and wherein the composition of the film is such that it needs merely to be surface wetted when placed between the surfaces to be bonded in the development of its sticky adhesive properties. Normally, the fluids contained in the mouth are sufficient to produce the desired wetting of the film.

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Another object of the present invention is to provide an unsupported water wettable adhesive film which retains its physical form under conditions of use and does not disintegrate, slough off or become degraded, but remains in an intact condition as a protective media or film.

Another object of the invention is to provide an adhesive material in the form of an unsupported sheet, film or filament which is adapted to be interposed between two surfaces to form, upon wetting of the surfaces thereof, an adhesive bond between the surfaces in effecting a secure union therebetween.

In accordance with the present invention, an adhesive material is provided which comprises an unsupported sheet or film which may be laid directly upon a denture of artificial teeth, the denture being then inserted into the mouth in a manner interposing the adhesive material between the denture body and the adjoining inner surfaces of the mouth. In this operation the interposed material takes readily the form of the adjacent surfaces of the mouth and denture and becomes sticky and strongly adhesive, forming an effective bond between the denture and mouth surfaces which is adapted to retain the denture comfortably and securely in its operative position for an extended period of time. Further, the interposed material is of such a nature that it will not disintegrate or slough off, but will remain intact in the form of a film, in a manner that, when desired, the denture may be removed by the wearer to provide for cleansing of the denture. Usually the used film is discarded in the daily cleansing of the denture and new film applied when the denture is again placed in the mouth.

In considering dentures for removable employment in the mouth, it will be recognized that regardless of the exactness of fit originally obtained upon the making of a denture, the wearer frequently suffers discomfort and physical pain due in part to the natural changes which take place thereafter in the contour of the mouth surfaces. These changes often result in loose fitting on the part of the denture, poor articulation, poor bite and chattering as well as an uneasy awareness, on the part of the wearer, of an unnatural condition present in the mouth.

As indicated above, the materials used heretofore for improving loose and uncomfortable denture fitting have included:

(1) Granular adhesives which are adapted to be sprinkled on a wetted denture. Ordinarily, such material is effective for only a few hours since it sloughs off and is swallowed with mouth fluids;

(2) Supported films, such as fabric impregnated with an adhesive material;

(3) Shaped wax-impregnated fabric forms which do not become adhesive when used;

(4) Shaped supported materials which do not become sticky adhesive but merely afford a mechanical cushion effect;

(5) Molded, preformed, cotton fiber pads;

(6) Vulcanized elastic fibers;

(7) Thermoplastic liners, both permanent and non-permanent.

The adhesive film of the present invention may be readily distinguished from these prior proposals. A preferred development is composed of the following ingredients in substantially the proportion set forth in parts by weight.

Table 1

	Parts
Water	28.3
Polyvinyl alcohol	5.0
Glycerol	.5

In producing my improved film with the use of the above materials, I dissolve the polyvinyl alcohol in water, or add the polyvinyl alcohol to water (preferably cold) and thereafter heat the same to about 75° C., stirring and holding the mixture until solution occurs, the glycerol content being then added.

A film composed of such materials may be cast by any usual procedure known to the art. For example, a uniform coating may be made from the solution by spreading the latter to about .025 of an inch in depth on a smooth surface and thereafter allowing the solution to dry to form a film of usable thickness. The depth of the solution so spread and formed will vary with the composition used and the thickness desired in the dried film.

It is within the scope of the invention to substitute lecithin for a part of or in approximately the same amount for glycerol.

Another variation of compositions within the scope of the invention is the following:

Table 2

	Parts
Water	28.3
Polyvinyl alcohol	5.0
Propylene glycol	1.0

Another formula is as follows:

Table 3

	Parts
Polyvinyl alcohol	4.0
Isopropyl alcohol	20.0
Lecithin	0.5

In compounding a film from the above ingredients of Table 3, I mix the same together thoroughly and allow the to stand for approximately 8 hours. To the materials I then add 2 parts of water which is thoroughly mixed into the same. To 3½ parts of the resulting mixture I add 1 part of polyvinyl alcohol and mix the products, thereafter casting the same into a film.

A film formed in accordance with this invention possesses advantages over prior preparations for the purpose set forth. First the film is extremely thin, and does not comprise a body having the thickness of a pad or cushion composed of yieldable fibrous or fabric materials, such as gauze or cotton. Therefore, because of its extreme thinness, the use of the material does not present a problem of bulk. Second, the film is not pre-shaped in its specific application to the mouth. Normally, I produce the film in the form of comparatively small flat sheets, which may be grouped together, if desired, in the form of a book adapted to be carried in the pocket or pocketbook of the users thereof. Such a sheet is detached from the book and may be cut if necessary to desired shape or size to fit a given denture, or the flat sheet may be laid upon the denture, then pressed down to its surface and any excess at the edges folded over upon the sheet itself to conform with the denture surface. Third, the sheets present when dry smooth, non-sticky surfaces which do not become sticky or adhesive until inserted into the mouth, where they are brought into contact with the natural mouth fluids. While I have stated that the sheets possess a smooth surface formation, it is within the scope of the

invention to roughen or crinkle the same, as by imparting a creped surface formation thereto. Fourth, the sheet or film remains intact in the mouth and does not slough off, and, therefore, is not lost as is an ordinary adhesive. Fifth, the material is stable toward the mouth fluids and is therefore not swallowed, and may be removed intact as a film. Usually, this used film is discarded after a certain period of use, normally whenever the wearer cleans the denture. Sixth, the film is unsupported and, therefore, takes readily the formation of the mouth to which it is applied. Moreover, it does not cause the wearer the discomfort which ordinarily accompanies the presence of a fabric, or thermoplastic sheet, arranged between the dentures and the mouth surfaces. Seventh, the product is inexpensive to manufacture and provides maximum convenience to the users thereof in its application in the mouth. Eighth, the material is sanitary and because of its character will not injure in any way the mouth tissues.

The invention is, of course, subject to certain variation or modification without departing from the spirit and scope thereof as defined by the following claims.

I claim:

1. The combination with a removable denture having a body composed of hard unyielding material molded to conform substantially with the shape of the mouth region occupied by the denture; and of an adhesive retaining device for holding said denture against undesired movement and positional displacement when in its operative position in the mouth, said device comprising a thin, unsupported flexible film plially interposed between the body of the denture and adjoining mouth tissue and conforming to the configuration of body surfaces in engagement therewith, said film possessing the property of surface adhesiveness when in contact with mouth fluids, whereby to cause the same to supply an adhesive bond between the denture body and the adjoining mouth tissue without deterioration in the form or composition of the film and its capability of reuse, said film consisting primarily of polyvinyl alcohol and a minor proportion of a plasticiser consisting of lecithin.

2. The combination specified in claim 1 and wherein said plasticiser consists of lecithin and glycerol.

3. A solution composed of polyvinyl alcohol, glycerine and lecithin admixed with water, said solution being castable to form a dry, unsupported, solid body or film having adhesive properties upon being wetted with salivary fluids.

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