Nov. 27, 1956 G. H. WILLIS 2,771,675

RUBBER DENTAL CUSHION HAVING LUBRICANT COATING

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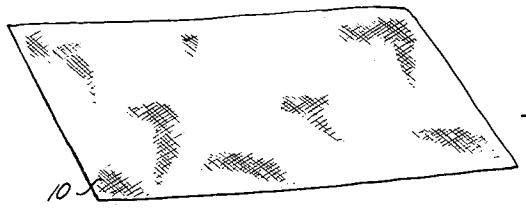


Fig. 1.

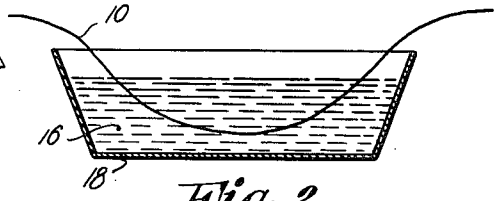


Fig. 2.

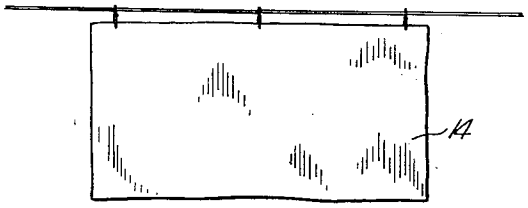


Fig. 3.

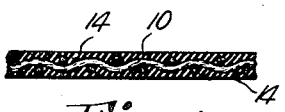


Fig. 4.

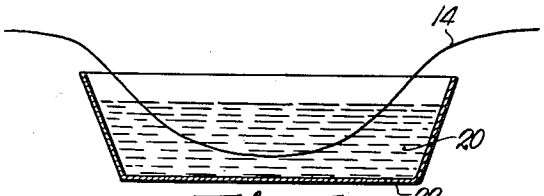


Fig. 5.

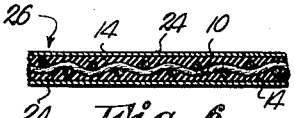


Fig. 6.

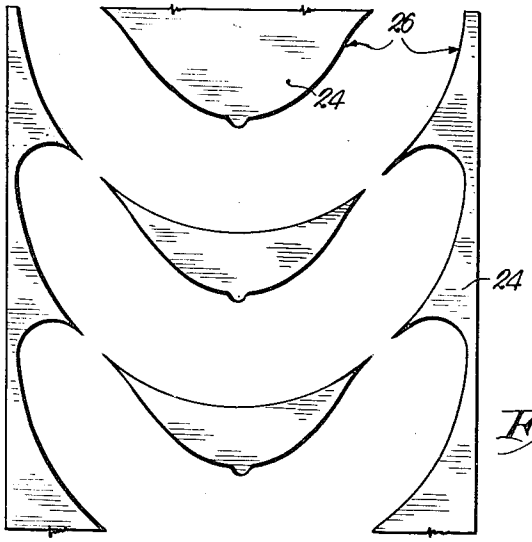


Fig. 7.

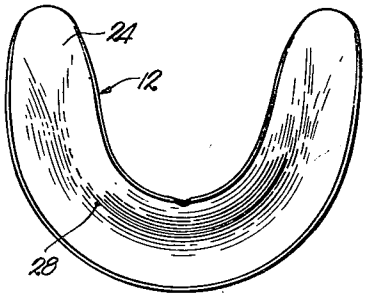


Fig. 8.

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RUBBER DENTAL CUSHION HAVING LUBRICANT COATING

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2 Claims. (Cl. 32—2)

This invention relates to an improved dental device for use by those having artificial dentures, the primary object being to present an article of manufacture adapted for use between the artificial denture and the associated gum to cushion the impact of the denture against the gum and at the same time avoid chafing, soreness and irritation to the gum by virtue of the frictional interengagement between the denture and the gum.

It is the most important object of the present invention to provide a dental device utilizing an elastic shock-absorbing medium as a cushion, together with a flexible mounting therefor, and a lubricant coating the cushion so as to reduce injury to the gum by virtue of frictional rubbing of the denture thereagainst, the elastic material being impermeable to penetration by the lubricant to prevent the latter from contacting the flexible mounting and to seal the latter against deterioration by the acids of the mouth.

Another important object of the present invention is to combine the advantages of fabric material in presenting a flexible mounting, plastic material for impregnating the fabric and encasing the same therewithin to present an impermeable cushion, and lubricating material for obviating deleterious effects of the frictionable rubberlike, elastic substance on the fleshy tissues forming the gums of the mouth.

Another object of this invention is to provide an improved method of producing dental devices from the afore-mentioned material which includes successive dipping and drying steps, together with a cutting and molding operation in presenting the desired shape, size and configuration conforming with the shapes of the denture and gum with which the pad or cushion is to be used.

In the drawing:

Figure 1 is a perspective view of an initially flat panel forming the core or mounting for the elastic body.

Fig. 2 is a cross-sectional view through a vat of liquid cushioning substance through which the panel of Fig. 1 is drawn.

Fig. 3 is a side elevational view illustrating the first drying step of the method.

Fig. 4 is an enlarged, cross-sectional view through the panel of Fig. 1 after the same has been subjected to the liquid of Fig. 2.

Fig. 5 is a view similar to Fig. 2 illustrating the second dipping step in a liquid lubricant such as paraffin.

Fig. 6 is a cross-sectional view through the panel, the cushion and the lubricant after drying and cooling.

Fig. 7 is an elevational view of a blank from which the dental devices hereof have been stamped and formed; and

Fig. 8 is a plan view of the dental device per se.

The difficulties experienced by most users of artificial dentures, particularly for the lower gums, is rather well known and in this respect those having highly sensitive nerve centers in the gums oftentimes find it impossible to use the dentures over long periods of time. Various attempts have been made to provide a cushion or pad adapted for insertion between the denture and the gum

and many have been successful in partially alleviating the painful effects of utilizing the false teeth. Suggestions have been made along the line of rubber because of its shock-absorbing characteristics and paraffin or like wax or gum compositions have been employed with varying degrees of success.

Rubber or rubbery substance alone, regardless of how the same is formed or the material utilized in mounting or construction, is much too harsh, and the advantages attained by its employment are offset by soreness in the gums because of the frictional contact of the rubber therewith.

When paraffin or the like is utilized such irritation of the gums is eliminated, but this substance does not provide a particularly good cushion since it is not springy or capable of resuming its original shape and thickness once the same is placed under pressure by the user clamping the dentures tightly thereagainst. Furthermore, paraffin tends to yield to pressure and thereby flow outwardly from between the denture and the gums and in a very short time the only benefit gained thereby is the protection afforded by the fabric material upon which the paraffin is mounted.

I have found that the advantages of rubberized fabric when properly lubricated, can be effectively employed in the production of dental cushions of the aforementioned character and the steps of such production are well depicted by the drawing. A suitable panel of flexible material designated by the numeral **10**, is illustrated in Figs. **1** and **2** and the same may consist of virtually any reticulated shbstance, preferably a fabric. Outing flannel has the advantage of being soft in itself, yet sufficiently nappy and porous to absorb and support a sufficient amount of rubber or the like to provide a cushion of the desired thickness, elasticity and strength. In this respect, it has been suggested that the nap of cloth be used as a cushion in devices of this type, but I have found that it has little value as a dampener, particularly when it becomes saturated with the liquid of the mouth. Thus, I prefer to completely embed the entire fabric panel **10**, including any nap thereon, and to utilize the same, not as a cushioning medium but, if at all, as a means of reinforcement for the impregnating and coating substance.

In carrying out the method of producing a finished rubberized dental cushion **12**, such as shown in Fig. 8 of the drawing, the panel **10**, whether the same consists of a netting, webbing or other material capable of being impregnated and completely saturated, is subjected to an elastic medium to present a body **14** on the panel **10** as illustrated in Fig. 4. The elastic medium **16** which I prefer is initially in a liquid form, and in order to assure full absorption of the liquid **16** by the panel **10**, the latter may be dipped into the liquid **16** within open top vat **18** as illustrated in Fig. 2.

It is to be preferred that a synthetic rubber be selected from one of the many lastics now available on the open market to provide the elastic medium **16**, rather than mere crude rubber, vulcanized or otherwise treated. The lastic should have elasticity or rubberiness as its outstanding characteristic, and when dry, body **14** should consist of a soft, pliable mass firmly bonded to the fabric **10** as distinguished from the hard and brittle nature of many rubber substances. It is desired particularly, that body **14** be resistant to atmospheric oxygen, body heat, corrosive chemicals and aging.

To this end therefore, and by way of example, a base material such as "Butyl" rubber, consisting normally of a copolymer of olefins and diolefins, may be prepared in a water dispersion through use of alkaline soaps. Body **14** will therefore, have a higher resistance to flex-cracking, have a softer feel, and be much better able to withstand liquid absorption than if made from natural rubber.

Additionally, it is virtually impermeable to all gases, wax-free, tasteless and odorless. To this end, it is desired that such substances as sulphur be eliminated from the formulation and that it contain nothing that could possibly produce a toxic or other harmful condition in the mouth or body of the user.

If desired, a suitable dye or pigment may be added to the liquid **16** and in this respect a water soluble food coloring is satisfactory.

The panel **10**, completely covered with the substance **16**, should thereupon be hung to dry from 24 to 60 hours or until all of the moisture content is removed, after which the mounting panel **10** is completely embedded or encased within the dried substance **16** as shown in Fig. 4.

It is to be noted that the panel **10** is hermetically sealed and the body **14**, serving as an envelope for the panel **10**, protects the latter against deterioration since it is virtually impervious to most all acids and alkalies and particularly to air and to moisture within the mouth of the user. The outermost surfaces of the body **14** are, however, extremely rough and frictionable after the substance **16** has dried thereon, and while the same might well be used as a dental pad because of the cushioning effect of the elastic body **14**, it would tend to irritate the gums and offset the advantages of utilizing the shock-absorbing characteristics of the body **14**.

Accordingly, it is essential that a suitable lubricant be placed upon the body **14** and such lubricant should be chosen from substances incapable of having any deleterious effect whatsoever upon the body **14**, particularly one that will not penetrate the latter, through to the panel **10**. Many types of wax compositions may be used for this purpose but paraffin is to be preferred and, therefore, after the drying step shown in Fig. 3 has been completed, the panel **10**, completely impregnated and saturated with the substance **16** to form body **14**, is subjected to hot, clear liquid paraffin **20** within a vat **22**, as shown in Fig. 5. The paraffin lubricant covering the body **14** should then be cooled and in approximately two or three minutes the steps of cutting and forming may be carried out.

Figure 6 of the drawing illustrates the paraffin coating **24** after it has hardened on the outermost surfaces of the body **14**. It shows additionally, the way in which the body or cushion **14** serves as a separator for the coating **24** and the panel **10**.

The next step in the method consists of subjecting the blank **26**, shown in Figs. 6 and 7, to a suitable machine for forming and stamping the dental devices **12** therefrom. Inasmuch as the pad **12** is adapted for use with lower dentures, it is of U-shaped configuration and should have a groove **28** formed therein to accommodate the gum. Several hundred pounds of pressure applied thereto at the time of cutting or stamping will form the groove **28** or render the device **12** substantially U-shaped in cross-section and the device **12** will retain such shape and configuration over long periods of use.

Inasmuch as the panel **10** is capable of absorbing the liquid **16** and the latter becomes completely impregnated with the same, body **14** is fully keyed in place in and around the warp and woof of the fabric core **10**, and when the finished pad **12** is subjected to bite pressure, it will not readily lose its shape nor tend to flow from between the denture and the gum.

Panel **10**, acting as a core or reinforcing structure, prevents elongation of the elastic material forming the

body **14** and since the latter is in fact pliable, yet resilient, it will yield to the pressure, absorb the shock and spring back to its original form and thickness each time the pressure is relieved. Because of its complete lack of porosity, food substances, bacteria, acids and alkalies cannot penetrate the body **14** nor come into contact with the textile material from which panel **10** is made to deteriorate the latter and to create an unsanitary condition by virtue of such bacteria collection.

While the paraffin coating **24** has very little cushioning effect, it is an excellent lubricant, presenting smooth surfaces as distinguished from the abrasive and rough frictionable nature of the body **14** itself.

By permitting the substance **16** to completely dry in the form of the envelope body **14** prior to applying the paraffin coating **24**, the fabric panel **10** is in fact completely sealed and encased within the body **14** and thereby protected throughout the life of the pad **12** against any deleterious effects of air or other fluids.

It has been found further that the finished article **12** may be used for a considerable period of time as distinguished from devices of this character presently being commercialized and need be replaced only after the coating **24** has been completely worked off of the body **14** by the constant movement of the plate with respect to the gum and after the pad **12** has become discolored and dirty. So far as the body **14** is concerned however, it will retain its cushioning effect for an indefinite period of time and all of the advantages above outlined may be attained through following the steps herein specified without appreciably increasing the cost of manufacture thereof.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. As a unitary article of manufacture, a dental cushion for use as an insert between an artificial denture and the associated gum, said cushion comprising an elastic body of synthetic rubber for cushioning the denture as the same is forced toward the gum, said body of synthetic rubber being substantially impermeable to aqueous fluids and impermeable to wax, a reticular flexible fabric panel completely encased within said body and completely saturated and impregnated by said synthetic rubber, and a lubricating coating of wax completely covering the body for reducing injury to the gum from friction between the body and the gum, whereby the body maintains the lubricating coating separate from and out of contact with said flexible fabric panel.

2. A shock-absorbing and substantially frictionless dental cushion for use as an insert between an artificial denture and the associated gum, said cushion comprising an outing-flannel core, an elastic shock-absorbing body of synthetic rubber, consisting essentially of a copolymer of olefins and diolefins, completely enveloping and impregnating said core, including any nap thereon, and a lubricating coating of paraffin wax on the surface of said synthetic rubber body, said synthetic rubber being impermeable to the paraffin wax and to fluids normally found in the mouth.

References Cited in the file of this patent

UNITED STATES PATENTS

2,170,043	Worrall	Aug. 22, 1939
2,392,513	Town	Jan. 8, 1946