

Dec. 4, 1928.

J. D. GAMBLE

1,693,598

POLISHING PAD FOR LENSES AND PROCESS OF MAKING SAME

Filed Sept. 6, 1927

FIG. 2

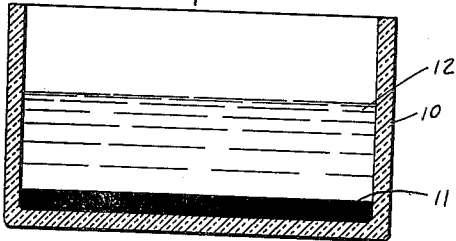


FIG. 1

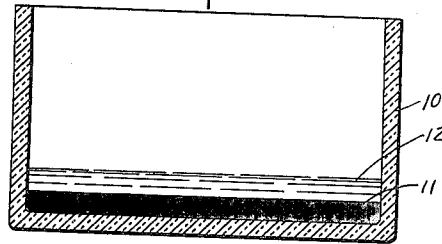


FIG. 4



FIG. 3

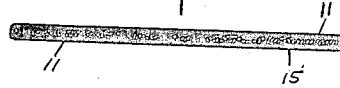


FIG. 5

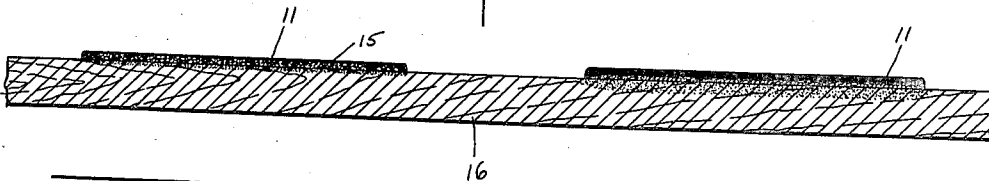


FIG. 7

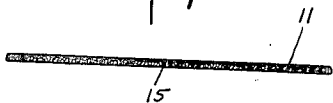


FIG. 6

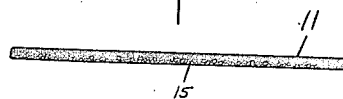
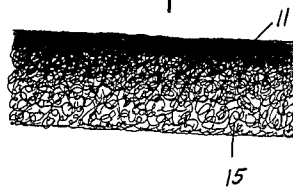


FIG. 8



INVENTOR.
JOHN D. GAMBLE.

BY
Sackwood, Sackwood, Goldsmith & Co.,
ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN D. GAMBLE, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO CONTINENTAL OPTICAL CORPORATION, OF INDIANAPOLIS, INDIANA, A CORPORATION.

POLISHING PAD FOR LENSES AND PROCESS OF MAKING SAME.

Application filed September 6, 1927. Serial No. 217,652.

The object of this invention is to improve the accuracy and the finish or surface texture of ophthalmic and other lenses, and particularly to enable this to be done by operators of what is known as prescription lens surfacing machinery in the average prescription surfacing plant. Heretofore a precision quality of finish in surface texture has required factory equipment which it is not practicable to adapt to prescription surfacing plants.

Heretofore pitch polishing has been known wherein a thick layer of pitch was mounted on a metal polishing tool or the like; and also felt polishing has been used wherein felt alone has been employed.

The chief feature of this invention is a combination of the element of felt and the element of pitch, substantially as herein set forth. The felt element has been proven to be practicable from the standpoint of its application to the prescription shop polishing tool and handling from the standpoint of prescription shop methods. The element of pitch has been proven to be the most satisfactory polishing element used to manufacture precision optical surfaces. This invention provides the advantages of both of the elements as heretofore used and obtains a much higher character of finishing optical surfaces by the combination.

To that end this new lens polishing means consists of a felt pad impregnated with pitch and the like on one side thereof with the other side practically free from pitch; and the process of making such polishing pad. This enables the pitch polishing pad to be made and supplied by the manufacturer to the prescription opticians in a practical and commercial way, and the opticians can then easily and practically secure the pitch pads on their polishing tools and thus do the highest quality of pitch polishing.

The advantages and nature of said invention will be understood from the accompanying drawings and the following description and claims.

In the drawings Fig. 1 is a central vertical section of a jar and conventional layers of pitch and benzol therein showing it producing a relatively strong solution for saturating felt pads. Fig. 2 is a similar section of a jar with conventional layers of benzol and pitch, showing a much greater quantity of benzol relatively for making a weaker pitch solu-

tion. Fig. 3 is a section of a polishing felt pad which has been saturated in the solution in the jar in Fig. 1. Fig. 4 is a similar view of a pad of felt which has been saturated in the solution of Fig. 2. Fig. 5 is a longitudinal section of an absorbing body with the pads shown in Figs. 3 and 4 placed thereon to remove completely or to a greater or less degree the pitch in one side of the pads. Figs. 6 and 7 are sections of the pads shown in Fig. 5 showing them in the finished form ready for use in polishing lenses. Fig. 8 is a section of a portion of a pad on a very large scale.

As stated before pitch has been used as a polishing material and also felt but the pitch has not been applied to the lenses by means capable of general use, especially by opticians generally, and the felt alone is not a superior polisher. A prime requisite for high class polishing of lenses is that the uniform curvature of previously generated surfaces shall be absolutely maintained during the polishing and, therefore, the surface of the polishing material must be practically uniform in character, otherwise the curvature of the lens surface which has been generated will be deformed. At some point the surface will be modified or polished away more than an adjacent surface so that the uniformity of the curvature of the surface is destroyed and the quality of the lens impaired. One object of this invention is to overcome the foregoing difficulty, as will hereafter be explained.

The nature of the polishing pad will be understood from the description of the process of making it. In that process a jar is employed which may be made of glass or the like and open at the top, as shown, although its form is not thus limited. In said jar there is placed a fluid or semi-fluid pitch and benzol. The proportion of these two ingredients may be modified as hereafter explained but in Fig. 1 they are shown to be substantially the same. For the purpose of illustrating this Figs. 1 and 2 are conventional for the benzol would mix with the pitch as soon as the two ingredients are brought together.

A felt pad is made preferably in circular form having substantially the same diameter as the tool on which the polishing pad is mounted when it is ready for use. The felt pad is placed in the pitch-benzol mixture in the jar and saturated therewith so that the pitch will be uniformly distributed through it.

The pitch impregnated pad is taken out of the jar 10 and placed upon a slow absorption material 16 such as a white pine board, as shown in Fig. 5. This is for the purpose of removing the pitch from one side of the polishing pad. The board 16 will absorb the pitch material quickly from the portion of the pad adjacent it, and, if left longer, will absorb practically all the pitch from the pad. The usual plan, however, is to absorb the pitch from one side of the pad and leave the pitch in the other side of the pad unchanged or uniform in pitch content, if it has been reduced in pitch strength by this pitch extracting process.

The foregoing step in the process produces the finished condition of the pitch pad, and it is shown in Figs. 6 and 7. This finished felt pad is impregnated on one side with pitch and is relatively free from pitch on the other side. The object of the removal of the pitch on one side of the pad is to enable the pad to be secured or glued to the pad holding tool (not shown) in the use of the pad for polishing lenses. If the pitch is not removed from one side of the pad, it cannot be secured on the holder effectively. When the pitch has been removed practically from the pad on one side, it can be effectively secured to the tool and produce a layer of uniform thickness with a uniform pitch polishing surface.

These pads are made by the foregoing process and sold to or distributed among prescription grinding opticians of all sorts for use by them when and as they desire in the usual apparatus which they have always in stock. To that end different grades of pitch polishing pads are made. These grades are made to differ or vary from each other in the following manner and process. By increasing the proportion of benzol 12 to the pitch 11, as shown in Fig. 2, the solution will be diluted. In the drawings there appears to be about four times as much benzol in Fig. 2 as in Fig. 1. This renders the solution in Fig. 2 much more diluted and, therefore, the felt pad will have a relatively smaller amount of pitch in it. In practice there are about a half dozen grades of these pitch polishing pads made in this manner, varying from that shown in Fig. 1 to that shown in Fig. 2, so as to furnish to the opticians a wide selection of different pitch polishing pads for them to choose from as they may desire or require. Thus, the optician would have at hand in small piles, a half dozen grades of pads. One pile would contain pads with a heavy deposit or layer of pitch and the pads in the other piles would have gradually a slighter deposit of pitch.

Further variations in the grades of the pitch pads is provided by the variable periods during which the pads are left on the pitch absorbing board 16. Each grade of pads may be further graded by leaving some

of them on the board longer than others so that the optician can be provided with a dozen or more different grades of pitch pads.

The pad produced with the strong solution of pitch, shown in Figs. 1, 3 and 6, will have a relatively thick layer of pitch on one side thereof, which will be solidly black in appearance like pitch, while the other side of the pad will be relatively free from pitch and have the color and appearance of felt. The pads made from the weaker solution will have relatively thinner layers or supplies of pitch on one side, while the other side will be relatively free of pitch and more like the natural color and appearance of the felt. But these characteristics vary according to the length of time they are left on the absorbing board 16. If left there long enough the pitch would be practically all removed from the felt by capillary attraction. The pads made with the very weak solution will on the pitch side look almost like a dark cloth, while with a strong solution, it will show a layer of pitch. This illustrates the possible wide variety of pitch strength capable of being imparted to these polishing pads.

By "pitch" is meant refined asphaltum and like material. As a polisher it is relatively hard and unyielding. The function of the felt is chiefly to carry the pitch.

This improved polishing pad is relatively easy to manufacture in quantities and uniform grades can be provided with little difficulty and the pads will be of permanent character so as to be handled, shipped or stored for the optician's use when desired without the character or quality deteriorating. This renders the manufacturing and distribution and use of these pads practical and economical.

Also said pads, as stated above, are capable of being quickly secured by the optician to the head on which they are mounted by a suitable adhesive, and will provide a uniform polishing surface that will produce a quality of finish and surface texture considerably excelling that capable of being produced by any other lens polisher heretofore known. It thus enables the optician to provide himself with means, at very slight expense, for providing his lenses with a polish equal to that which is provided by the best equipment in any factory.

The value of the invention has been particularly noticeable in the polishing of the outer or prescription sides of one-piece bifocal lenses. Heretofore the bifocal sides of such lenses were generated and finally polished by the factory, because it alone had the equipment necessary to do such work well, and the outer or prescription side has practically always been finished by the optician. This has been the only method of making and distributing such lenses that was considered practical.

Therefore, the optician has not been able to give the prescription side of said lenses the high quality of finish that was provided on the bifocal side by the factory and to this extent said lenses have not been of the highest quality theoretically. But this invention enables the opticians throughout the country to finish the prescription side of these one-piece bifocal lenses fully as well as the bifocal side can be finished by the factory and thereby provide the old people of the country with a more nearly perfect one-piece bifocal lens than has been heretofore furnished them.

The invention claimed is:

1. The process of making a lens polishing pad, which process consists in saturating a

pad composed of felt and the like with pitch material, and thereafter extracting such pitch material from one side of the pad to the desired degree, substantially as set forth. 20

2. The process of producing polishing pads, for lenses, which process consists in mixing pitch and benzol in a proportion to produce a pitch solution of the desired strength, saturating a pad composed of felt and the like with said pitch solution, thereafter placing the pad on an absorbing board and extracting the pitch material from one side thereof to the desired degree. 25

In witness whereof, I have hereunto affixed my signature. 30

JOHN D. GAMBLE.