June 8, 1954 F. G. FRITZSCHE 2,680,697

ART OF CLEANSING LENS MOUNTING BLOCKS

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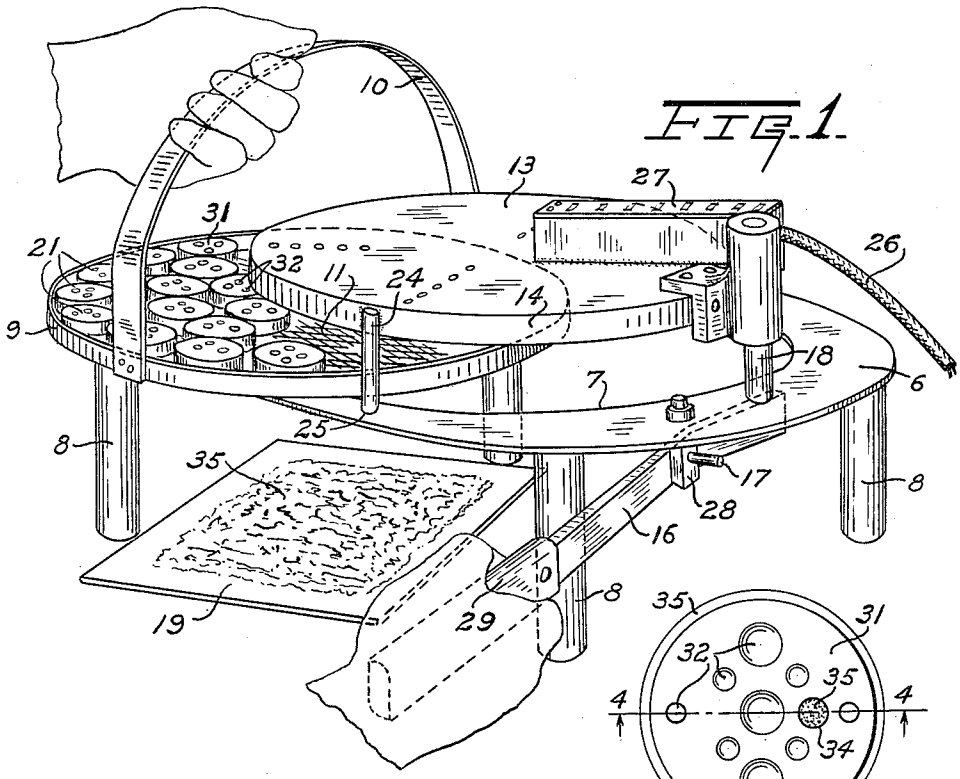


FIG. 1.

FIG. 3.

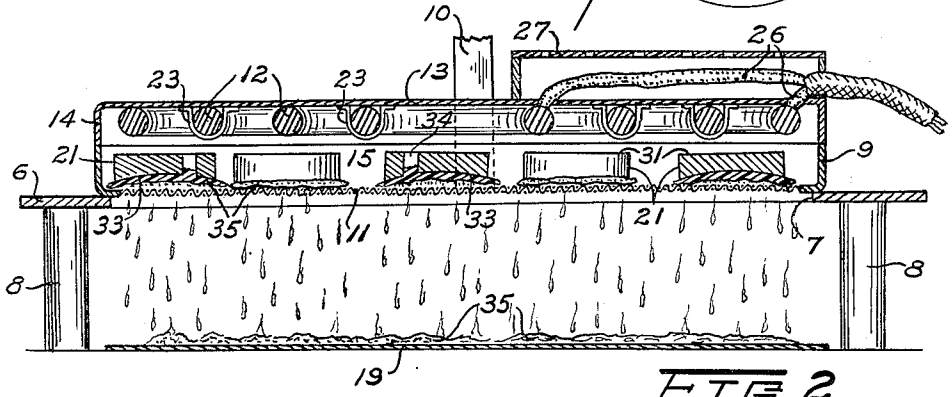


FIG. 2.

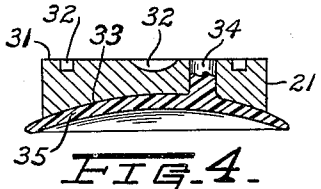


FIG. 4.

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ART OF CLEANSING LENS MOUNTING BLOCKS

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6 Claims. (Cl. 134—5)

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This invention relates generally to improvements in the art of cleaning lens mounting blocks, and relates more specifically to an improved method of removing the pitch which is used to attach the blanks of optical lenses or the like to the blocks which support these blanks while they are being ground.

The primary object of my invention is to provide an improved method of cleansing lens mounting blocks and for effectively removing pitch therefrom after the finished lenses which were attached to the blocks by the pitch during the lens grinding operation, have been removed.

In the manufacture of optical and other lenses, it is customary to fasten the lens blanks to mounting blocks by means of a heavy layer of pitch deposited within a cavity formed in one face of each of the cylindrical blocks. This pitch effectively holds the blanks while they are being ground and polished, and after the finished lenses have been released the pitch must also be removed and the mounting blocks must be thoroughly cleaned preparatory to the application of fresh pitch layers and lens blanks. Many of these mounting blocks are provided with pitch injection openings which become more or less filled with plugs of pitch when the lens blanks are being fastened to the blocks, and after each blank has been properly mounted upon a block the pitch hardens and adheres to both the blank and the block.

In order to clean the mounting blocks it has heretofore been common practice to utilize a solution capable of dissolving the pitch, which besides being rather expensive, also required a relatively long time. This solution furthermore became polluted and relatively ineffective after short usage, due to the absorption of the thick pitch layers; and when the blocks were provided with injection opening containing plugs of the pitch, it was necessary to knock these out with special tools. In some cases the excess pitch was also knocked off before the solvent was used, but this procedure aften resulted in damaging the mounting blocks, so that the prior cleaning methods were tedious, slow and costly.

It is therefore an important object of the present invention to provide an improved method of rapidly and effectively removing excess pitch from lens mounting blocks and for prolonging the usefulness of pitch solvent which may be employed for final cleansing of the blocks.

Another important object of this invention is to provide a simplified mode of removing pitch deposits from lens mounting blocks with the aid

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of heat but without danger of drawing the temper or otherwise marring the blocks, and without necessity of otherwise removing the plugs from the pitch injection openings with special equipment.

These and other more specific objects and advantages of the invention will be apparent from the following detailed description from which it will be noted that the gist of the improvement is the provision of a method of confining a multiplicity of used metal lens mounting blocks having concavities coated with pitch, in inverted position upon a perforated deck, and for applying limited heat to the upper surfaces of the confined blocks sufficient only to melt and cause the pitch to drip through the deck but insufficient to injure the finish of the metallic blocks.

A clear conception of the several steps involved in the improved method, and of the construction and operation of a typical unit for exploiting the method, may be had by referring to the drawing accompanying and forming a part of this specification in which like reference characters designate the same or similar parts in the various views.

Fig. 1 is a perspective view of a commercial unit for effecting removal of excess pitch deposits from a group of lens mounting blocks, in accordance with the improved method, showing the tray for holding the blocks only partially loaded and being removed from the heating zone;

Fig. 2 is a somewhat enlarged vertical section through the unit of Fig. 1, taken centrally through the heating zone and showing the heater in operation;

Fig. 3 is a further enlarged bottom view of a typical lens blank mounting block having a pitch injecting opening therethrough and its concavity lined with pitch which projects slightly beyond the block periphery; and

Fig. 4 is a transverse section through an inverted mounting block such as shown in Fig. 3, the section being taken along the line 4—4.

While the invention has been shown and described as having been exploited in an electrically heated unit for removing excess pitch from cylindrical optical lens mounting blocks of a particular type, it is not my intention to unnecessarily restrict the use of the method by virtue of this limited showing; and it is also contemplated that specific descriptive terms used herein be given the broadest possible interpretation consistent with the disclosure.

In accordance wth the improved method of

removing the pitch from lens mounting blocks, and for finally cleaning the blocks preparatory to the reception of subsequent lens blanks, the used pitch lined blocks are first disposed in inverted position upon a perforated support, then the block laden support is confined within a chamber which is heated only sufficiently to melt the pitch and to cause most of the molten pitch to gravitate from the heating zone through the support, and finally the blocks while still resting upon the support are immersed in a pitch solvent solution which dissolves and removes the residual thin coating of pitch from all surfaces and leaves the blocks in perfectly cleansed condition.

A simple type of apparatus for carrying on the excess pitch removal, is illustrated in the drawing, and comprises in general, a table 6 having a large central opening 7 and adapted to be supported upon legs 8; a basket 9 having an annular wall or brim provided with a carrying handle 10 and with a perforated bottom deck 11; an electrically energized heating element 12 suspended from a top cover 13 having an annular rim or wall 14 adapted to cooperate with the brim of the basket 9 to provide a confined heating zone 15 above the deck 11; a lever 16 swingably suspended from the table 6 by a pivot pin 17 and being cooperable with a depending rod 18 secured to the cover 13 in order to lift the heater while a block laden basket 9 is being applied to or removed from the table 6; and means for energizing the heating element 12.

The table 6 may be formed of metal and the opening 7 should be unobstructed and of sufficient size to avoid overlapping the deck 11 when a basket 9 is resting upon the table top beneath the top cover 13, and the table supporting legs 8 should be of sufficient length to permit a large sheet of cardboard 19 to be freely positioned between these legs some distance below the perforated deck 11. The circular baskets 9 of which several duplicates may be provided, should also be formed of durable metal, and the annular brim of each basket should be slightly higher than the height of the mounting blocks 21 and of sufficient diameter to accommodate at least several dozen of these blocks 21. The perforated block supporting deck 11 may be formed of screening or of perforated sheet metal secured to the annular brim.

The electric heating element 12 is of spiral formation and is suspended from the top cover 13 by means of clips 23 as shown in Fig. 2, and the annular rim 14 of the cover 13 should be formed to snugly fit the brim of each basket 9 when the latter are properly positioned upon the table 6. The cover wall or rim 14 should also be of limited height in order to cause the heating element 12 to be located within the zone 15 closely adjacent to but spaced slightly from the inverted blocks 21 resting within the baskets 9, and the cover 13 is provided with several parallel vertical guide pins 24 which are slidable through openings 25 in the table 6 and cooperate with the lifting and lowering rod 18 to maintain the cover in horizontal position or parallel to the table top at all times. The heating element 12 is adapted to be controllably energized from any suitable source of electric current through conductors 26 extending through a ventilated housing 27 secured to the top of the cover 13; and the lever 16 has its medial portion fulcrumed upon the pin 17 which coacts with a depending bracket 28 secured to the table 6, while one end is swingable up and down to raise or lower the cover 13 and its opposite end is provided with a manipulating handle 29.

The cylindrical lens mounting blocks 21 are accurately constructed of steel and are standard, and the base surface 31 of each block is plane and provided with various types of block mounting detents 32, while the opposite surface 33 is of concave spherical zone formation and is connected with the surface 31 by an opening 34. This opening 34 is utilized to inject fluent pitch 35 between the concave surface 33 and each lens blank which is to be ground to shape, as shown in my prior Patent No. 2,465,153, granted March 22, 1949, entitled Apparatus for Blocking Optical Lens Blanks, and when the pitch 35 has been injected it hardens and firmly retains the lens blank in position upon the block 21 while the lens is being ground and finished. When each lens is finally ground and polished, it is removed from its mounting block 21, leaving the surface 33 covered with an adhesive layer of pitch 35 which projects beyond the concavity and also partially fills the opening 34, as illustrated in Fig. 4, and the present improved method and apparatus relate to the removal of this pitch so that the blocks 21 may be used for subsequent lens blank mounting purposes.

During commercial exploitation of the present improved method of cleansing the pitch coated blocks 21 and after the finished lenses have been removed, a plurality of the blocks 21 are first placed in inverted position upon the perforated bottom deck 11 of one of the baskets 9, whereupon the lever 16 should be manipulated as shown in Fig. 1 to lift the cover 13 and the heating element 12 away from the table 6. The block laden basket 9 may then be applied to the top of the table 6 beneath and in central alinement with the elevated cover 13, whereupon the cover should be lowered by gravity to position the parts as shown in Fig. 2 with the rim 14 of the cover 13 snugly engaging the brim of the basket 9. The heating element 12 should thereafter be energized to gradually heat the chamber 15 and the inverted blocks 21 confined therein, sufficient to melt the pitch 35 and to cause the excess molten pitch to flow through the perforations of the deck 11 and to permit the pitch to gravitate upon the cardboard 19 located beneath the table opening 7. This heating should be continued until the bulk of the pitch 35 has been removed from the concave block surfaces 33 and from the openings 34 and only a thin film of pitch remains, but must not be of sufficient intensity to injure the finish of the blocks 21.

When the excess pitch 35 has been thus removed, the heating element 12 and cover 13 may again be elevated by manpulating the lever 16, whereupon the basket 9 can be withdrawn and immersed with the blocks 21 still therein, within a bath of pitch solvent solution to quickly remove the residual thin pitch films and to thoroughly cleanse the blocks 21 and the basket 9 as well. These several cleansing steps may be carried on in rapid succession; and in establishments wherein a great number of lenses are ground, several similar baskets 9 each adapted to hold three or more dozens of inverted blocks 21, may be provided. By properly regulating the heat, scorching of the pitch 35 and resultant smoking and odors can be readily avoided; and since only a thin film of pitch need be dissolved and removed by the solvent solution, the latter will remain potent for a long period of time.

From the foregoing detailed description, it will be apparent that the present invention provides a simple but very effective method of cleaning the lens mounting blocks 21 and for preventing rapid pollution of the costly solvent solution used for final cleansing of the blocks. When the cardboard sheets 19 have accumulated excessive deposits of the pitch 35, they may be discarded, and by enclosing the blocks 21 within a heating zone 15 in close proximity to the heating element 12 most efficient heating results and the excess pitch is quickly removed. The degree of heating may also be regulated with simple controls so as to prevent smoking and odors, and the improved apparatus is simple, compact and readily manipulable to receive the successive blank laden baskets 9 and to rapidly remove the major portion of the pitch deposits.

The use of the baskets 9 also facilitates handling and treatment of large numbers of the blanks 21 without necessity of touching these blanks until they have been finally cleaned and dried, and the basket deck 11 is also cleaned while the blanks 21 are being immersed within and swished through the final solution. The large opening 7 in the table 6 prevents pitch from accumulating upon the table top, while the pins 24 and the lifting rod 18 facilitate proper positioning of the successive baskets 13 upon the table 6. The removal of the excess pitch 35 by heating also consumes far less time than when all of the pitch was dissolved in a solvent solution as with the prior practice, besides prolonging the usefulness of such solvent. The improved method and apparatus have proven highly satisfactory and successful in actual use, and may obviously be used in conjunction with various types of lens mounting blocks 21 whether provided with pitch injection openings 34 or not.

It should be understood that it is not desired to limit this invention to the exact steps of the method or to the precise construction of the apparatus, herein shown and described, because obvious modifications within the scope of the appended claims may occur to persons skilled in the art.

I claim:

1. The method of cleansing pitch laden lens mounting blocks, which comprises, placing the blocks in inverted position upon a perforated deck, gently heating the blocks to melt the excess pitch and to cause the molten pitch to gravitate through the perforations of the deck, and finally immersing the blocks in a pitch solvent to remove the residual films of pitch therefrom.

2. The method of cleansing pitch laden lens mounting blocks, which comprises, placing the blocks in inverted position upon a perforated deck, gently heating the blocks to melt the excess pitch and to cause the molten pitch to gravitate through the perforations of the deck, and finally immersing the blocks and the supporting deck in a pitch solvent solution to remove the residual films of pitch therefrom.

3. The method of cleansing pitch laden lens mounting blocks, which comprises, placing the blocks with their pitch laden surfaces resting upon a perforated deck, covering the deck and heating the covered blocks from above sufficient to melt the pitch and to cause excessive molten pitch to escape through the deck perforations, and finally immersing the blocks in a patch solvent solution to remove residual pitch therefrom.

4. The method of cleansing pitch laden lens mounting blocks, which comprises, placing the blocks with their pitch laden surfaces resting upon a perforated deck, covering the deck and heating the covered block from above sufficient to melt the pitch and to cause excessive molten pitch to escape through the deck perforations, and finally immersing the blocks and their supporting deck in a pitch solvent solution to remove residual pitch film therefrom.

5. The method of cleansing pitch laden lens mounting blocks, which comprises, placing the blocks en masse with their pitch laden concavities exposed directly toward a perforated supporting deck, enclosing the blocks from above and gently heating the same from above to melt the pitch and to cause excessive molten pitch to escape by gravity through the deck perforations, and thereafter exposing the blocks and deck to pitch solvent solution to remove residual pitch therefrom.

6. The method of cleansing pitch laden lens mounting blocks having pitch injection openings therein, which comprises, placing the blocks en masse with their pitch coated surfaces directed toward a perforated supporting deck, enclosing the blocks and gently heating them from above only sufficiently to melt excess pitch from within the injection openings and the pitch mounting surfaces of the blocks and to cause the molten pitch to escape through the deck perforations, and thereafter exposing the blocks to a pitch solvent to remove residual pitch therefrom.

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