Feb. 27, 1945. H. E. BESSIN ET AL 2,370,389

ART OF TAKING IMPRESSIONS OF EYEBALLS

Filed May 6, 1941

Fig. 1

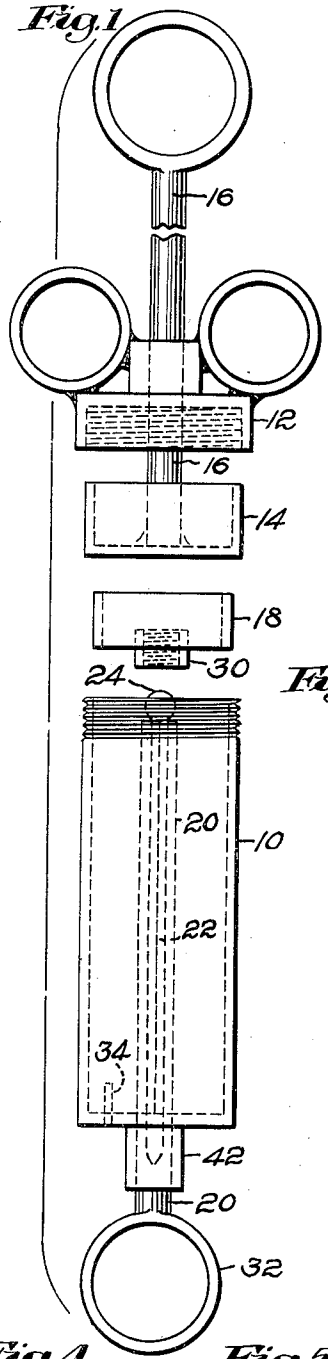


Fig. 2

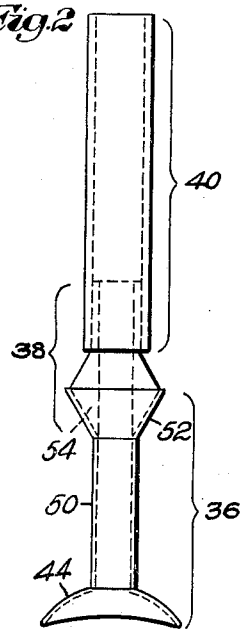


Fig. 3

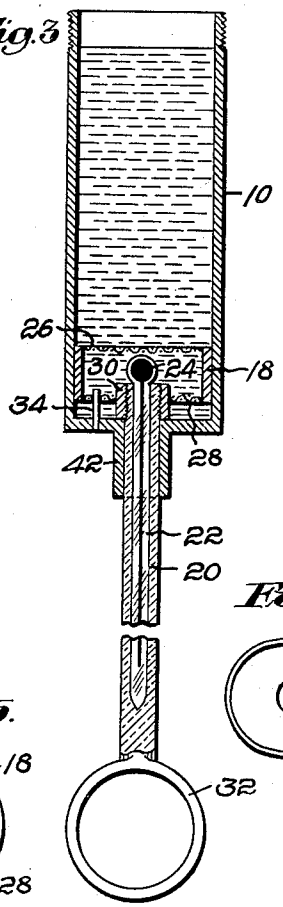


Fig. 6.

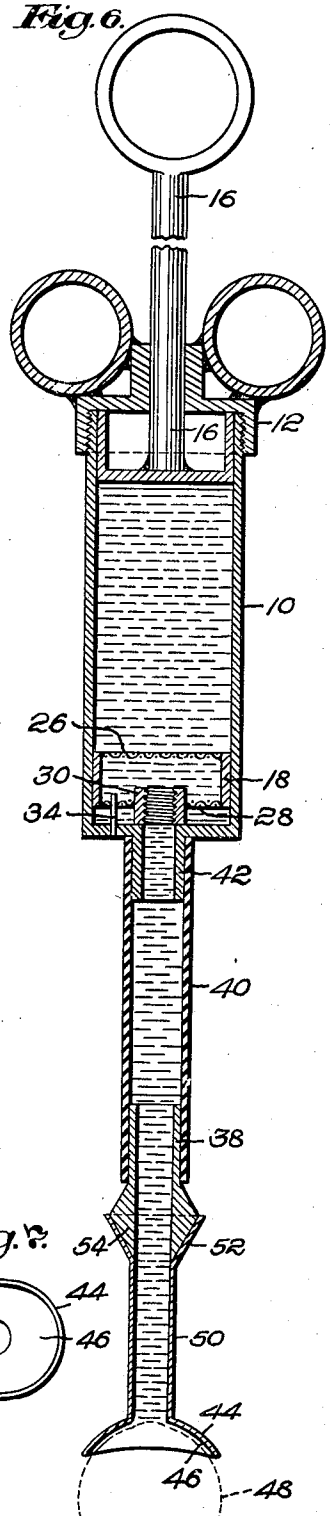


Fig. 4.

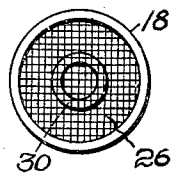


Fig. 5.

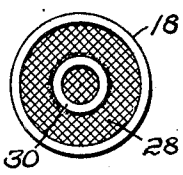
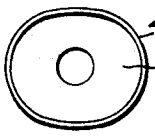


Fig. 7.



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ART OF TAKING IMPRESSIONS OF EYEBALLS

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2 Claims. (Cl. 18—55)

This invention relates in general to the art of taking impressions and more particularly to the taking an impression of an eye-ball by the use of substance which can be rendered fluid by the application of a moderate heat, then rendered homogeneous by gentle agitation called "muddling," then allowed to cool to a temperature somewhat above body temperature, then applied to the eye-ball, and finally allowed to cool and harden at body temperature. The invention aims generally to improve the methods of applying the casting compound to the eye-ball, more easily and conveniently and the resulting impression or cast more perfect, thereby making it possible to produce better positive casts from the negative impressions, and thus to enable contact lenses to be made to fit the eye-balls more accurately.

The invention will best be understood by reference to the following description when taken in connection with the accompanying drawing of a specific apparatus embodying the invention, while its scope will be pointed out more particularly in the appended claims.

In the drawing:

Fig. 1 is an elevation of several constituent parts of the apparatus, namely, the pump cylinder, cylinder-head, pump piston and piston-rod, "muddling" piston and its hollow, transparent piston-rod, and thermometer within the hollow piston-rod;

Fig. 2 is an elevation of the remaining component parts of the apparatus, namely, the part which may be termed the applicator with its casting shell, tubular supply stem, and funnel, the coupling member, and the rubber tube for connecting the coupling member to the pump cylinder outlet;

Fig. 3 is a longitudinal sectional view of the pump cylinder, "muddling" piston, its hollow, transparent piston-rod, and the thermometer within the latter, showing the cylinder charged with the casting compound;

Figs. 4 and 5 are top and bottom plans, respectively, of the "muddling" piston and its screens;

Fig. 6 is a longitudinal, sectional view of the pump, the applicator, the coupling, and the flexible connecting tube assembled and completely charged with casting compound, as they appear when taking an impression of an eye-ball shown in dotted lines; and

Fig. 7 is a bottom plan of the casting shell portion of the applicator.

Referring to the drawing and to the embodiment of the apparatus illustrated therein by way of example, and having reference at first to Fig. 1, there is shown a pump cylinder 10, a cylinder head 12, a pump piston 14 with its piston-rod 16, a "muddling" piston 18, its hollow-transparent piston rod 20, and a thermometer 22 received within the latter and having a bulb 24 to be exposed to the casting compound to indicate the temperature.

The first step is to introduce a sufficient quantity of a casting compound into the pump cylinder 10. The casting compound commonly used in the art is known by the trade-name Negocoll. This substance, when heated to a temperature of 180° F. flows rather freely, though it has a fairly high viscosity. It is said to contain fibers which are so delicate that the compound should not be agitated by stirring because this would break the fibers, and the practice is to break up any lumps by what is known as "muddling" to render it homogeneous while heated to the correct temperature.

The arrangements for observing the temperature and for "muddling" will now be described more in detail, reference now being had to Fig. 2. The "muddling" piston 18 in the present example is in the nature of a ring having two coarse-mesh screens 26 and 28 secured thereto as by soldering and the screen 28 is centrally apertured to receive a hub or nut 30 internally threaded to screw onto the adjacent end of the hollow-transparent piston-rod 20 which is externally threaded for that purpose. The piston-rod may be made of a transparent plastic such as the one known as Lucite. After the pump cylinder has been filled nearly to the top, the "muddling" piston is introduced and held stationary while the piston-rod 20 is a screwed into the nut 30. To facilitate manipulation of the piston-rod, the latter is conveniently provided with an appropriate handle 32 by which the rod and the piston can be moved lengthwise in the cylinder to cause the thorough mixing of the compound by causing the latter to flow through the screens 26 and 28. In the meantime, the compound is subjected to a temperature of about 180° F. as by immersion of the cylinder in hot water maintained at that temperature as by a thermostatic control. The temperature within the cylinder may be observed by the aid of the thermometer 22 with its bulb 24 within the cylinder.

When the compound has been sufficiently heated and rendered homogeneous, the next step is to remove the piston-rod 20 and thermometer 22. The piston 18 should be held against rotation while the piston-rod 20 is rotated in the proper direction to unscrew the rod from the nut

30, and to this end the lower screen 28 is caused to descend and impinge upon a pin 34 upstanding from the lower end of the cylinder 10. The piston-rod can now be unscrewed readily.

The remainder of the apparatus will now be described, reference being had at first to Fig. 2, which shows an applicator 36, a coupling 38, and a flexible tube 40 to connect the coupling to the outlet of the cylinder 10, the latter, to this end, being provided with a nipple 42 (see Fig. 6) for the attachment of the tube. The applicator will now be described in detail, reference being had to Figs. 6 and 7. A casting shell 44 of appropriate size and shape is provided with a cavity or chamber 46 whose spherical surface is formed on a radius somewhat greater than that of the eye-ball 48 shown in dotted lines. The introduction of the casting compound to the cavity 46 is through a tubular stem 50 to be coupled to the coupling member 38 as by providing the applicator with a conical recess 52 to receive a cone 54 on the coupling member. A sufficiently close seal between the two can be maintained by the fingers pressing one into the other. The applicator may be made of any appropriate material such as suitable metals, alloys, plastics, or synthetics.

After the cylinder 10 has been charged, the compound heated and muddled, and the temperature allowed to fall to about 108° F. as shown by the thermometer 22, the latter and the enclosing piston-rod 20 are removed and are replaced by the coupling member 38 and the flexible tube 40.

Preferably, a two-person technique is employed. While one person is performing the hereinbefore described operations, the other person is placing the applicator in position on the eye-ball. This necessitates lifting the eyelids from the eye-ball sufficiently to permit the introduction of the margin of the casting shell 44 behind the eyelids. The applicator is now held in place by one person while the other person places the cone of the coupling member into the conical recess of the applicator, and the second person operates the piston 14 to cause the expulsion of a sufficient amount of the casting compound to form within the casting shell a negative cast of the cornea and the surrounding area of the eye-ball. The compound will cool and harden at body temperature. The applicator can then be removed carrying the cast with it. Afterwards, a positive cast can be made from the negative cast and used for the fitting of a contact lens later to be applied to the eye-ball.

Having thus described our invention, what we claim and desire by Letters Patent to secure is:

1. In the art of taking an impression of an eye-ball, the steps of holding a casting shell having a generally spherical cavity adjacent to the eye-ball and pumping a casting substance into that part of said cavity which is between the eye-ball and said shell.

2. That step in the art of taking an impression of an eye-ball, which is characterized by pumping under pressure above that of the atmosphere a column of casting substance to a generally spherical chamber about a portion of the eye-ball.

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