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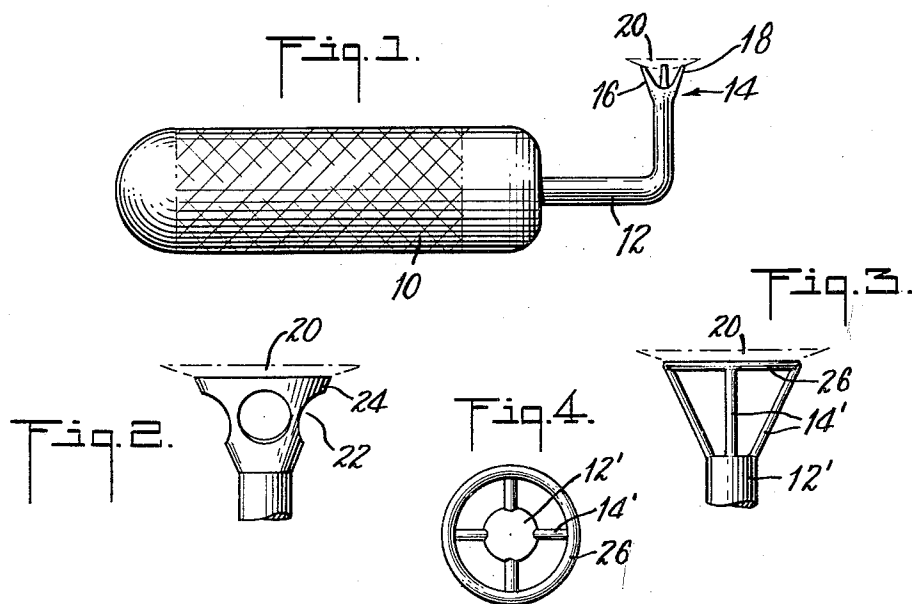
J. D. SPRIGGS

3,177,874

CONTACT LENS APPLICATOR

Filed May 19, 1960

2 Sheets-Sheet 1



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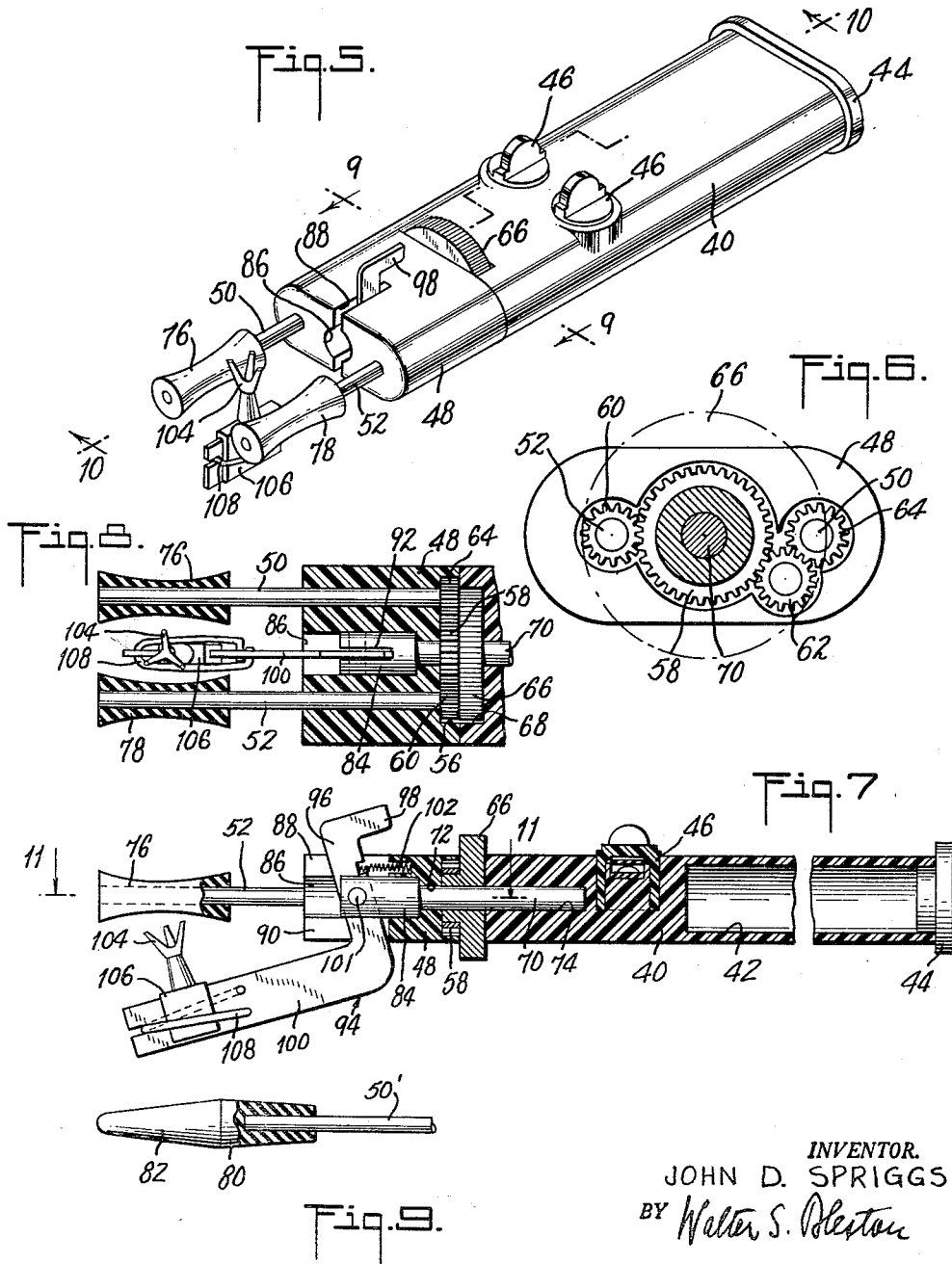
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2 Sheets-Sheet 2



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## CONTACT LENS APPLICATOR

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The present invention relates to means for applying a contact lens to the user's eye.

Devices have been proposed for the mentioned purpose in which the lens is held on the rim of a suction cup and thus placed on the eye. However, with such devices it happens that either the suction is too great, in which case the lens having contacted the eye may again be removed with the suction cup, or that the suction is too weak in which event the user, relying on the suction, may easily drop the lens. Even in such instances in which the lens is properly applied, the stiffness of the suction cup or other lens-supporting instrumentality is apt to injure or at least to irritate the eye by the application of the lens.

The invention aims, therefore, to provide a simple means for supporting the lens during its application wherein the supporting means is so soft and readily flexible that no harm to the eye will occur.

However, it has been found in many instances that the user of a contact lens encountered great difficulties due to the fact that the eye-lids must be spread apart during the application of the contact lens.

Therefore it is another object of the invention to provide an apparatus operative with one hand whereby the lids of the eye can be spread open, and while they are so held, the lens can be applied.

Further objects and details of the invention will be apparent from the description given hereinafter and the accompanying drawing showing embodiments thereof by way of example. In the drawing:

FIG. 1 is a side elevation of a contact lens applicator according to the invention;

FIGS. 2 and 3 are side elevations of two modifications, respectively, on a larger scale;

FIG. 4 is a top plan view of the form of FIG. 3;

FIG. 5 is a perspective view of an apparatus with lid-spreader and lens applicator, the latter being in the applying position;

FIG. 6 is an enlarged section along line 9—9 of FIG. 5;

FIG. 7 is a section along line 10—10 of FIG. 5 with the apparatus in the inoperative position of the lens applicator;

FIG. 8 is a sectional view of the front part of the apparatus of FIG. 5, and

FIG. 9 is a side elevation of a modified part thereof, partly in section.

Referring now to the drawing, FIG. 1 shows the means for applying the lens in its simplest form. This applicator comprises a hand-grip 10 to which a supporting body 12 is secured in any conventional and suitable manner (not shown). The body 12 which is cranked in the illustrated form, is of a soft flexible material such as a soft natural or artificial rubber, whereas the grip may either be integral with the body 12 or may be of a plastic material. The body 12 has a head 14 formed of three upwardly extending prongs 16 which are arranged on a circle and flare somewhat upwardly so that their tips 18 are located on a larger circle the diameter of which, however, is somewhat smaller than a contact lens 20 which may be placed thereon. For applying the lens to the eye, the lens is first dipped into water and then positioned on the prongs 16 to the top of which the lens is held owing to the water surface tension. While the

lids of the user's eye are opened with the fingers of one hand and the head is held in a position so that the eyes can see straight downward, the lens applicator is brought upward by the other hand so as to place the lens into the eye and upon the eye-ball whereupon the lids may be released and the applicator removed.

There exist conventional lens applicators with suction cups for holding the lens. However, such suction cups have not the softness and flexibility necessary to protect the eye against irritation or even injury. Therefore, where a cup form for the head of the applicator is used instead of the prongs 16, the cup wall, according to the invention, is provided with large openings 22 as in the cup shaped head 24 in FIG. 2. The holes exclude any undesirable suction effect and simultaneously render the cup flexible. More preferable, however, is the form of FIGS. 3 and 4 where the head comprises the prongs 14' connected on top by a ring 26. The body piece 12', prongs 14' and ring 26 form one integral piece of soft rubber.

In its preferred form, the lens-support is a movable part of an instrument in which it is combined with a device for spreading open the lids of a user's eye, so that the lens can be readily applied to the eye-ball. Such an instrument is illustrated in FIGS. 5 to 8, FIG. 5 showing the lens-support in the applying position whereas in FIG. 7 the inoperative position is shown. The instrument comprises the grip 40 which may be hollow as at 42 and have a lid 44 to serve also as a container. Additional receptacles 46 may be provided in the grip, one of which may be destined for storing a contact lens. Forward of the grip, a block 48 is arranged in which two shafts 50 and 52 are journaled. A set of gears is located in a recess 56 at the rear of the block 48 and connected to the shafts in such a manner that a drive wheel 58 meshes with a gear 60 on shaft 52 and with an intermediate gear 62 which, in turn, meshes with a gear 64 on shaft 50. In consequence, the shafts 50 and 52 can be simultaneously driven in the opposite direction. Gear 58 is secured by means not shown to a knurled disc 66 which is located in a recess 68 at the front end of the grip 40 and projects with portions of its circumference beyond the contour of the grip. Gear 58 and disc 66 are freely rotatable on a shank 70 which is located in bores 72 and 74 of the block 48 and grip 40, respectively, and holds the two together. Thus, the shafts 50, 52 can be rotated by turning the disc 66. The front ends of the shafts 50 and 52 are covered by rubber sleeves 76 and 78, respectively. These sleeves may be of cylindrical form. However, the illustrated shape in which the longitudinal section, as in FIG. 8, is bordered by two concave lines, is preferred because it is better adapted to the shape of the eye. In certain instances, the modified form of FIG. 9 is selected where the shaft tip 80, of soft rubber, engages the shaft 50' only through a short portion of its length so that the free end 82, which is frusto-conically shaped, can readily bend.

The aforementioned shank 70 has at its front end a head 84 which is located in a recess 86 constituting a widened front portion of the bore 72. An upper and a lower slot 88 and 90 respectively, extend from the recess 86 in the central plane between the shafts 50 and 52 and are continued at 92 through the shank head 84. A Z-shaped lever 94 having a web 96 and two legs 98 and 100 is pivoted at 101 with its web 96 in the slot 92. The upper leg 98 is located above the block 48, and the lower leg 100 extends below the block 48 substantially as far as the ends of the shafts 50, 52. It will be noticed that in FIG. 5 leg 100 is in its raised position whereas in FIG. 7 it is shown lowered. A compression spring 102 may be provided tending to urge the lever 94 in an anti-clockwise

direction although the greater weight of the leg 100 than that of leg 98 has the same tendency. A lens-support 104 which may be of the type of one of the FIGS. 1, 2 or 3 is provided with a slotted foot 106 and is shiftable along the leg 100. It is secured in an adjusted position by a clamp 108 so that it extends upwards towards the plane in which the shafts 50 and 52 are located and in the range of the sleeves 76, 78.

The instrument is to be used in the following manner: With lever 94 in its inoperative position, a wetted contact lens will be placed on the lens-support 104. Thereupon the instrument is so applied to the eye to be provided with the lens that the rubber sleeves 76 and 78 or the tips 80 if such are used of the shafts 50, 52 bear against the upper and lower lids, respectively, of the eye. By one or more than one finger of the user's hand holding the grip 40, e.g., by the thumb and one other finger, the disc 66 will be so turned that the oppositely rotating sleeves spread the eyelids open. When this is attained, at least one finger will hold the disc 66 stationary so that the lids stay open. At that time one other finger will press the lever leg 98 down thereby raising the lens-support to apply the lens to the eye. When the lens is in place, the instrument may be removed so that also the lens-support on leg 100 returns to the inoperative position.

It will be apparent to those skilled in the art that many alterations and modifications of the structure shown and hereinbefore described can be made without departure from the essence and spirit of the invention which for that reason shall not be limited but by the scope of the appended claims.

I claim:

1. An applicator for applying a contact lens to a user's eye comprising: a manually grippable body member; an elongated supporting member extending from said body member; a lens-supporting head disposed at the end of said supporting member; said head being of soft elastic material, being substantially frusto-conical in outline, and flaring outwardly from said supporting member, the outer diameter of said outline of said head being smaller than that of the contact lens, and at least one opening in the wall of said head to avoid any suction at the rear of a supported contact lens; two parallel spaced shafts extending from said body and applicable to the lids, respectively, of a user's eye, said shafts being rotatable simultaneously in opposite directions; manually operable means for rotating said shafts; said lens-supporting head being movable in a path including a location between said shafts to apply a lens supported thereby to the eye the lids of which are spread open by said device; and manually operable means for moving said lens-supporting head.

2. An instrument as in claim 1 in which said shafts have free end portions opposite one another, elastic sleeves covering said free ends so as to be applicable to said lids respectively.

3. An instrument as in claim 1, wherein the longitudinal cross-section of said sleeves is bordered by two opposite concave lines.

4. An instrument as in claim 1, said shafts having free end portions opposite each other, an end piece of a soft elastic material being provided for each shaft end, each end piece being an elongated element having a surface of revolution and coaxially shifted on the co-ordinate shaft so that the shaft enters only a minor portion of said element, the major portion of the latter projecting from said shaft end, the element having a major diameter approximately in registry with the ultimate shaft end and being tapered substantially frusto-conical towards its free end.

5. An instrument for fitting a contact lens to an eye of

a person, comprising a rigid manually grippable body member; two parallel shafts extending from said body member with elastic free front ends applicable to the eyelids of a user but spaced from each other wider than the length of the diameter of a contact lens for spreading the eyelids open; manually operable means disposed at the opposite ends of said shafts for rotating them simultaneously in opposite directions; and a lens support extending from said body member and movable in a path including a location between said shafts to apply the lens on said lens holder to the eye while said eyelids are held open by said shaft ends.

6. An instrument as in claim 5, further comprising a block in which said shafts are journaled between said manually operable means and said free front end portion of said shafts, and a lever pivoted in said block so as to swing in a plane parallel to and between said shafts, said lens support being positioned on said lever, said lever being manually operable to apply a lens on said holder to the eye while said eyelids are held open by said shafts.

7. An instrument as in claim 6, said support being adjustably shiftable along and secured to said lever.

8. An instrument as in claim 6, further comprising a spring between said lever and said block so as to urge said lever away from the lens-applying position.

9. An instrument as in claim 6, said lever being substantially Z-formed and pivoted in the web between the two oppositely directed legs of the Z, said lens-support being positioned on the one of said legs and the other leg being operable by the user's finger.

10. An instrument for applying a contact lens to an eye of a person, comprising a hand-grip and a block in coaxial arrangement; two parallel shafts having elastic free end portions opposite each other and being journaled in said block, a set of gears located in said block and attached to said shafts so as to rotate said shafts in opposite directions and to spread open the lids respectively of an eye to which said shaft ends are applied, a driving disc connected to said gears simultaneously to rotate the same in opposite directions and projecting outward between said grip and said block so as to be operable by fingers of the user's hand, a Z-shaped lever pivoted with the web thereof in said block between said shafts so as to be rockable in a plane parallel to said shafts, an elastic lens support being mounted on one of the opposite legs of said Z-lever and forming a head adapted to receive and carry on the free end of said head a contact lens, said free end of said head being located on a circle of a diameter slightly smaller than that of said lens and also smaller than the spacing of said shafts, the other leg of said lever being actuatable by another finger of the same hand whereby pressure on said other leg will move said support into a position to apply the lens to the eye while the lids are held spread open by said shafts.

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