CLAIMS

1. An apparatus for injection molding of contact lens mold halves for use in the manufacture of contact lenses, the apparatus comprising one or more first tool halves mounted on a first support, and one or more second tool halves releasably mounted on a second support, wherein:

with the second support in an operative orientation, the first and second supports are movable between a closed position in which the first and second tool halves engage one another to provide corresponding mold cavities therebetween, and an open position in which the first and second tool halves are aligned with one another across a part removal gap; and

the second support is movable between the operative orientation, and a reloading orientation in which the second tool halves are located in a tool change area that is out of alignment with the first tool halves.

2. The apparatus according to claim 1 wherein the first support and the second support are movable between said open and closed positions along an upright axis.

3. The apparatus according to claim 1 or 2 further comprising one or more third tool halves releasably mounted on the second support, wherein with the second support in the reloading orientation the first support and the second support are movable between a further closed position in which the first tool halves and the third tool halves engage one another to provide corresponding mold cavities therebetween, and a further open position in which the first tool halves and the third tool halves are aligned with one another across a part removal gap.

4. The apparatus according to claim 3 wherein with the second support in the operative orientation, the third tool halves are located in the tool change area.

5. The apparatus according to claim 3 or 4 further comprising one or more fourth tool halves releasably supported on the second support.

6. The apparatus according to any preceding claim wherein the first support and second support are movable between the open and closed positions by moving them along a molding axis, and the second support is rotatable between the operative and reloading orientations about an axis which is parallel to the molding axis.

7. The apparatus according to any preceding claim wherein the second tool half or each second tool half is configured to form an optical surface of said mold half.

8. The apparatus according to any preceding claim further comprising one or more alternative tool halves which are configured to be releasably mounted on the second support in place of the second tool halves.

9. A part of an apparatus according to any preceding claim, said part comprising the first support, the second support, and a drive mechanism for moving the first support and the second support between the open and closed positions and moving the second support between the operative and reloading orientations.

10. A method of injection molding mold halves for use in the manufacture of contact lenses, the method comprising:

moving a second support to an operative orientation, and then moving a first support and the second support to a closed position such that one or more first tool halves supported on the first support and one or more second tool halves releasably supported on the second support engage one another to provide corresponding mold cavities therebetween;

injecting a molten polymer into the mold cavities, then allowing the molten polymer to solidify in the mold cavities and form mold halves;

moving the first support and the second support to an open position such that the one or more first tool halves and the one or more second tool halves are aligned with one another across a part removal gap;

removing said mold halves through the part removal gap;

moving the second support to a reloading orientation in which the one or more second tool halves are located in a tool change area which is out of alignment with the one or more first tool halves; and

removing the one or more second tool halves from the second support.

11. The method according to claim 10 wherein moving the first support and the second support to the closed position and moving the first support and the second support to the open position each comprises moving the first support and the second support along an upright axis.

12. The method according to claim 10 or 11 wherein the step of moving the second support to the reloading orientation also moves one or more third tool halves, which are also releasably supported by the second support, into alignment with the one or more first tool halves, and the method further comprises:

moving the first support and the second support to a further closed position, with the second support in the reloading orientation, such that the one or more first tool halves and the one or more third tool halves engage one another to provide corresponding mold cavities therebetween;

injecting a molten polymer into the mold cavities, then allowing the molten polymer to solidify in the mold cavities and form additional mold halves;

moving the first support and the second support to a further open position such that the one or more first tool halves and the one or more third tool halves are aligned with one another across a part removal gap; and

removing said additional mold halves through the part removal gap.

13. The method according to claim 12 wherein moving the second support to the operative orientation also moves the one or more third tool halves to the tool change area.

14. The method according to claim 12 or 13 wherein the step of moving the second support to the operative orientation also moves one or more fourth tool halves, which are also releasably supported by the second support, into the tool change area.

15. The method according to any one of claims 10 to 14 wherein:

moving the first support and the second support to the closed position and moving them to the open position each comprises moving the first support and the second support along a molding axis; and

moving the second support to the operative orientation and moving the second support to the reloading orientation each comprises rotating the second support about an axis which is parallel to the molding axis.

16. The method according to any one of claims 10 to 15 wherein the step of allowing the molten polymer to solidify in the mold cavities and form mold halves comprises allowing some of said molten polymer to solidify against optical surfaces provided by said one or more second tool halves so as to form optical surfaces of said mold halves.

17. The method according to any one of claims 10 to claim 16 further comprising the step of replacing the one or more second tool halves removed from the second support with one or more alternative tool halves.