The invention relates to a method and apparatus for producing glass ampoules in particular double ampoules which comprises drawing an elongated thin neck into a glass tube at a distance from the end of the tube corresponding to the length of one ampoule body. The neck is twice the normal length of an ampoule neck and is later divided in the middle. At a distance from the end of the neck equal to the length of a second ampoule body at least one ampoule is melted off from the tube and simultaneously each ampoule bottom is closed. During drawing of the ampoule neck that portion of the double neck where separation is to be effected, is cooled, to form a funnel-shaped end on each single length neck.

5 Claims, 3 Drawing Figures
The invention relates to a method of producing ampoules, particularly double ampoules, which comprises drawing an elongated thin neck into a glass tube at a distance from the end of the tube corresponding to the length of one ampoule body, said neck being twice the normal length of an ampoule neck and being later divided in the middle, and at a distance from the end of the neck equal to the length of a second ampoule body melting off an ampoule or double ampoule from the tube with the simultaneous closing of the ampoule bottoms.

In conventional methods of carrying out the above procedure, the portion of the glass tube between the two ampoule bodies is heated by a burner and then reduced to the desired diameter between chucks which move apart (German Pat. Specification No. 889,970). Double ampoules are thus obtained, and when these are separated the single ampoules have elongated necks with cylindrical ends.

When such ampoules are to be filled, particularly when they are filled on automatic filling machines, difficulties are often experienced and to overcome these it is desirable before filling the ampoules to expand the ends of their necks to make them funnel-shaped.

The formation of such funnel-shaped mouths at the ends of the ampoule necks requires the performance of additional operations which not only adversely affect the cost but also necessitate the provision of an additional working station in the ampoule filling machine.

It is an object of the present invention to avoid this additional expense and to provide a method of imparting the desired funnel shape to the mouths of the ampoule necks without needing additional operations.

According to the invention this is achieved during the drawing of the ampoule neck by cooling that portion of the double neck where separation is to be effected and thus simultaneously forming a funnel-shaped end on each neck.

The proposed method has the advantage of being extremely economical to perform, a circumstance of considerable importance, bearing in mind that ampoules are mass produced articles.

The additional apparatus needed for performing the method is very small. A preferred apparatus according to the invention comprises an upper and a lower rotating chuck of which at least one is movable to and fro for drawing an ampoule neck. There is provided, for forming the double length neck, an assembly consisting of at least two burners of which the first serves for forming one part and the second the other part of the double length neck, and of a blowing nozzle for blowing cold air immediately between the two burners.

In the proposed method, and when using the proposed apparatus, the filling funnels at the ends of the ampoule necks are not produced by expanding the neck ends, as was hitherto the practice, but by preventing the corresponding portion of the double neck from being drawn down during the process of production of the ampoule respectively double ampoule. Hence two filling funnels are formed simultaneously with the production of the double ampoule neck.

The invention will be hereinafter more particularly described by way of example, with reference to an embodiment shown in the accompanying drawing in which:

FIG. 1 is a apparatus in a first operative position for performing the method according to the invention, FIG. 2 is a view of the apparatus in FIG. 1 from above and FIG. 3 is the apparatus in FIG. 1 in a second operative position.

With reference to the drawings a glass tube 11 is held between the jaws 12 of an upper rotating chuck 13 and of a lower rotating chuck 14. The latter chuck 14 is also adapted to be lowered and raised as indicated by an arrow 15. The rotary movement of both chucks is in the direction indicated by an arrow 16. Moreover, both chucks bodily travel along a circular path 17 indicated in FIG. 2 by an arrow 18. In the course of this latter motion they pass different working stations. At the station where the necks of the ampoules are formed a swivel arm 19 is adapted to swing about a hinge 20 at the end of a swing arm 21 attached by a pin 22 to part 23 of a glass working machine. The swivel arm 19 carries rollers 24 which bear against the circumference of the upper chuck 13 with which they are kept in contact by springs not shown in the drawing. Fast with the swivel arm 19 is a rod 25 containing splines 26 engaged by a bush 28 which can rise and fall on the rod without rotating. The bush carries three pipes 29, 30 and 31, of which pipes 29 and 31 are connected to supply pipes 32 and 33 providing a mixture of gas and air, whereas pipe 30 is connected to a supply pipe 34 for cold air. The end of the pipes 29 and 31 facing the glass tube 11 are each fitted with a burner 35 and 36, whereas the end of pipe 30 carries a blower nozzle 37.

In FIG. 1 portions 38 and 39 of the glass tube 11 are heated by the flames of the burners 35 and 36, whereas portion 40 is cooled by the cold air issuing from the blowing nozzle 37. When the tube has been heated to a required temperature the chuck 15 and the bush 28 together with their associated parts jointly descend. The heated portions 38 and 39 of the glass tube are thus elongated so that they assume the shape illustrated in FIG. 3. Since portion 40 of the glass tube cannot be deformed by the cold air issuing from the blowing nozzle 37, the tube here retains its original diameter. At the end of this drawing process which is defined by the bush 28 being intercepted by a stop 41 the necks of two ampoules will have been formed. At a following station which is not shown the glass tube is allowed to slip a predetermined distance downwards in a manner known in the art and the double ampoule is separated by melting it off with the simultaneous formation of the bottom of the upper ampoule, and of the bottom of the following lower ampoule. The further division of the double ampoules into single ampoules can be performed outside the machine.

In the illustrated embodiment the burners 35, 36 and the blowing nozzle 37 participate in the downward movement of the chuck 14 during its descent. As an alternative it would also be possible in a modified form of construction of the proposed apparatus to keep the assembly comprising the burners and the blowing nozzle stationary on the swivel arm 19. In such an arrangement the burners and the blowing nozzle would remain in the position they are shown to occupy in FIG. 1 and the lower chuck 15 would not be lowered until the glass tube was outside the range of the burners and blowing
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3 nozzle. Such a procedure would also lead to the development of the configuration shown in FIG. 2.

I claim:

1. A method of producing ampoules, particularly double ampoules, which comprises drawing an elongated thin neck into a glass tube at a distance from the end of the tube corresponding to the length of one ampoule body, said neck being twice the normal length of an ampoule neck and being later divided in the middle, and, at a distance from the end of the neck equal to the length of a second ampoule body, melting off at least one ampoule from the tube with the simultaneous closing of each ampoule bottom, characterised in that during the drawing of the ampoule neck that portion of the double neck where separation is to be effected is cooled to form a funnel-shaped end on each single length neck.

2. Apparatus for producing double ampoules, comprising an upper and a lower rotating chuck, of which at least one is movable to and fro for drawing an ampoule neck, characterised in that, for forming a double-length neck, an assembly consisting of at least two burners is provided, of which the first serves for forming one part and the second the other part of the double length neck, and in that a blowing nozzle blowing cold air is located intermediately between the two burners.

3. Apparatus according to claim 2, characterised in that the burners and the blowing nozzle are attached to a swivel arm.

4. Apparatus according to claim 2, characterised in that the burners and the blowing nozzle can be lowered and raised jointly with the lower chuck.

5. Apparatus according to claim 3, characterised in that the burners and the blowing nozzle can be lowered and raised jointly with the lower chuck.

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