

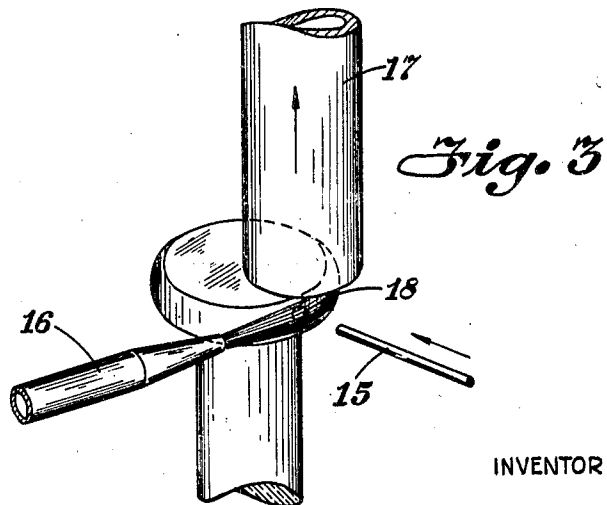
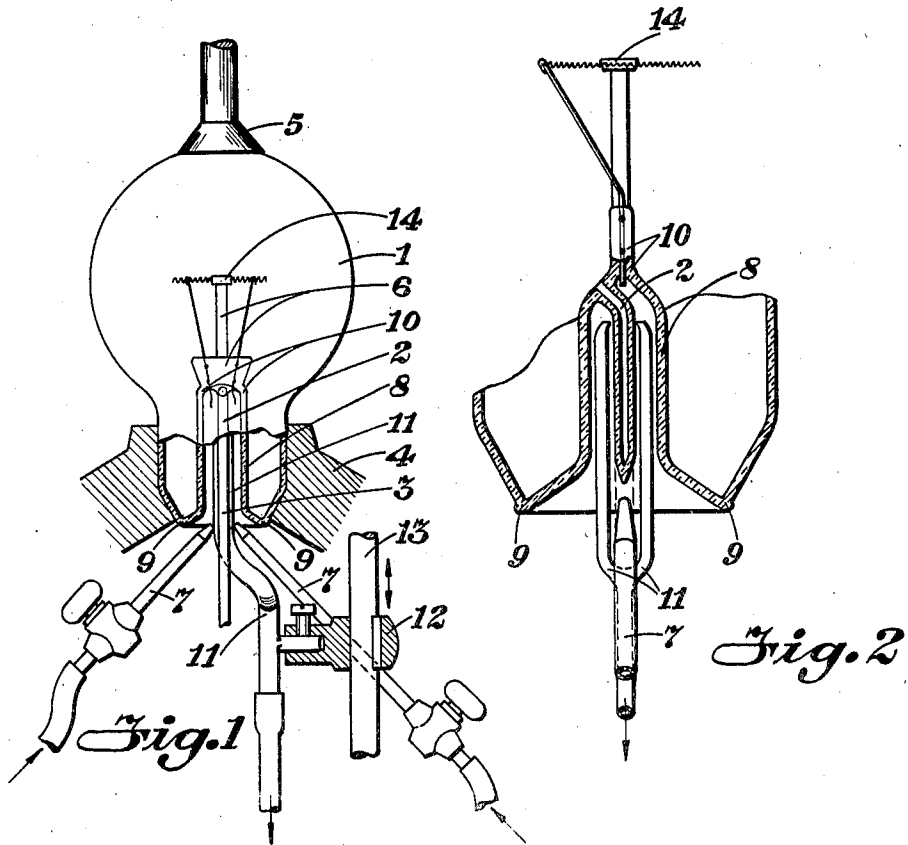
Dec. 18, 1934.

C. A. H. MULDER

1,984,488

METHOD OF AND MEANS FOR THE LOCAL HEATING OF BODIES

Filed Aug. 15, 1932



INVENTOR
CORNELIS ANDRIES HEERO MULDER,
BY *Charles V. Wilson*
ATTORNEY

UNITED STATES PATENT OFFICE

1,984,488

METHOD OF AND MEANS FOR THE LOCAL
HEATING OF BODIESCornelis Andries Heero Mulder, Oosterbeek,
Netherlands, assignor to General Electric Com-
pany, a corporation of New YorkApplication August 15, 1932, Serial No. 628,908
In the Netherlands August 7, 1931

8 Claims. (Cl. 49—78)

The present invention relates to methods of and means for the local heating of bodies.

The object of the invention is to provide a method of and a means for purely local heating or melting without doing any damage to parts adjacent the point that is heated. It is known that difficulties are encountered, especially in bodies made of materials with a melting point that is not too high, such as tin and zinc and in the case of bodies which consist of a material which readily becomes plastic when heated, such as glass, if it is desired to heat such bodies purely locally, for instance, for the purpose of adding other parts or in order to melt off parts of the body. It has been found that the parts adjacent the part it is desired to heat either melt or becomes plastic with the result that generally speaking, said adjacent parts are deformed. Frequently, this is very undesirable and makes the body totally useless. This is found to be especially the case if it is desired to heat or melt within an indentation or a hole in the body.

According to the invention, the hot gases created during the heating are drawn away from those points where the heating is not desired.

The basis of the invention is therefore the recognition of the fact that the surroundings of the point that is heated can be most readily cooled by completely removing the hot gases which are formed during the heating and which strike the parts adjacent that point.

In this instance the created hot gases not only mean the combustion gases, but also the heated air in the vicinity of the point to be heated.

In order to make the heating as local as possible, one or more accurately directed pointed flames are used. The direction of the flames is, in certain cases, influenced by the suction elements for the removal of the hot gases. It is possible to draw off a greater volume of gas than the volume of the combustion gases. The flame is pulled more or less in the direction of the suction device and thus points in a direction away from the parts adjacent the heated part. Around the flame a comparatively cool zone is created in this manner. Even some of the cold air at some distance from the flame is also drawn away.

The method, according to the invention, can be applied in many ways. Especially in the incandescent lamp industry, in the discharge tube industry and in the mercury switch industry, where glass vessels are used which must be heated purely locally and which must be sealed off pure-

ly locally, the method according to the invention is of great importance.

A typical application is the sealing of so-called pump stems of incandescent lamps or discharge tubes. These pump stems as a rule consist of a hollow glass tube which is in connection with the internal space of the lamp; the space of the lamp is exhausted through that tube; these stems frequently are located, at least partly, in an indentation of the glass wall of the lamp or discharge tube. In the manufacture of such devices it is often desirable to seal these pump stems inside the indentation of the glass wall; the part of the pump stems which projects beyond the glass wall must be removed. If for this purpose directed pointed flames are used, then the shrinkage will be very great as the wall in the vicinity of the point that is heated is deformed or cracks. The invention can here be used to advantage. This will be explained more in detail with the aid of the drawing.

A second example of a case where the invention can be utilized to advantage is the joining of bodies to other bodies. In the incandescent lamp and discharge tube industries, it is frequently necessary to fasten metal supporting wires and the like into glass bodies. The place where they are to be fastened is heated after which the metal body is placed into the sealing place which has become plastic.

The method, according to the invention, can also be utilized to advantage in this case in order to prevent a greater part of the body than strictly necessary from becoming plastic as it would then be apt to lose its shape and further in order to prevent wires which have already been placed from coming into contact with the flame during the heating of a subsequent sealing place as the wires would then be oxidized and sag. A third application which deserves mention is the joining of bodies by means of a soldering material. In this case it may also be desired to heat no more of the body than is absolutely necessary.

In the drawing accompanying and forming part of this specification two embodiments of the invention are shown, in which

Fig. 1 is a front elevational view of an apparatus embodying the invention,

Fig. 2 is a detailed view of the heating means turned 90° from the view shown in Fig. 1, and

Fig. 3 is a front elevational view of another embodiment of the invention.

Like numbers denote like parts in all views of the figures.

Referring to Fig. 1 the stem of lamp 1 is shown in cross section. The lamp is supported in a centering holder 4 and/or is under certain circumstances held in place by a vacuum cup 5. The holder and the cup are shown schematically as is the spider 6. The pump stem 2 must be sealed off at 3. For that purpose two torches 7 are directed to that point by means of which sharp pointed flames are obtained. The sealing-off of the pump stem 2 without further precautions would be almost impossible. This arrangement is comparable to a bell, consisting of the lamp 1 with the indentation 8, which is placed over the pointed flames. However, if the flames are such that they burn properly notwithstanding that fact, it is obvious that not only the parts 9 of the wall of the bulb, but also the part 10 of the spider will be greatly deformed due to excessive heating. In order to prevent this, two pipe lines 11 are arranged as shown in Fig. 2, and said lines 11 are kept at a pressure less than atmospheric pressure. The developed hot gases are led away through these lines. The lines are preferably arranged so that they can move with the result that it is possible to place them in the indentation and to remove them therefrom. The line which in this construction is fork-shaped, is fastened to a body 12 which is supported by a bar 13 which can be given an alternating motion. The mechanism necessary for that motion has not been shown on the drawing.

Fig. 2 shows the fork-like construction of the suction line and the relation of the torches 7 thereto.

In Fig. 3, 14 is the so-called button of a lamp spider. The button is also visible in Figs. 1 and 2 where it is indicated by 14. At a periphery of this glass body 14, the metal wires 15 are to be inserted (in this case the supporting wires of the filament of the lamp). One of the places where the wire is to be inserted is indicated by 18. The place 18 is heated by means of the pointed flame from the torch 16, which has approximately a tangential direction. The hot gases and in certain cases even a quantity of cold gases are drawn away through the suction line 17. The direction of the flame can thereby be adjusted in such a way that it is as advantageous as possible.

As already indicated above, so much gas can be drawn away that a zone of comparatively cool gases is created around the flame so that the flame cannot cause any great amount of deformation in the immediate vicinity thereof.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. Method for locally heating bodies comprising the step of drawing off the hot gases created during the heating from those places that are not to be heated and directing the heating means by suction.

2. Method for the local heating of bodies by means of one or more pointed flames, comprising the step of drawing off the hot gases created during the heating from those places that are not to be heated and directing by suction the pointed flames to the part of said body to be heated.

3. An apparatus for the local heating of bodies, comprising a heating device, and suction means to draw away the hot gases created during the heating from those places which are not to be heated, said suction means directing said heating device to the part of said body to be heated.

4. An apparatus for sealing a pump stem of an exhausted vessel comprising at least one gas jet pointed to the sealing place, and suction means to draw off the hot gases away from the places which are not to be heated, said suction means directing the flame from said jet to a part of said pump stem.

5. An apparatus for sealing a pump stem of an exhausted vessel comprising at least one gas jet directed to a point of the pump stem located within an indentation of the wall of the bulb, and suction means to remove the hot gases from the bottom of the indentation and the walls thereof adjacent said stem said suction means directing the flame from said jet to the point of said stem to be heated.

6. An apparatus for sealing a pump stem of an exhausted vessel comprising at least one gas jet directed to a point of the pump stem located within an indentation of the wall of the bulb, and suction means to remove the hot gases from the bottom of the indentation and the walls thereof adjacent said stem and to direct the flame from said jet to the point of said stem to be heated, said means being adapted to be introduced into and removed from said indentation.

7. An apparatus for placing metal bodies in glass bodies comprising means to heat elements for the sealing point and means for the removal of the hot gases created by said heating means said last named means directing said heating means.

8. An apparatus for the joining of bodies by a soldering material comprising a heating means and a suction means for the removal of the hot gases produced by said heating means said suction means directing said heating means.

CORNELIS ANDRIES HEERO MULDER.