UNITED STATES PATENT OFFICE.

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METHOD OF OPENING THE SHADE ENDS OF HAND-BLOWN GLASS ROLLERS.

1,351,710. Specification of Letters Patent. Patented Aug. 31, 1920.

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To all whom it may concern:

Be it known that I, CHARLES F. WARRICK, a citizen of the United States, residing at Morgantown, in the county of Monongalia and State of West Virginia, have invented a new and useful Method of Opening the Shade Ends of Hand-Blown Glass Rollers, of which the following is a specification.

This invention is a method by which the closed end of a hand blown glass cylinder or roller may be opened preparatory to the carrying out of the splitting and flattening operations.

In practising the common method of the hand blowing of window glass, a roller or cylinder is formed, one end of which is attached to the blow pipe and the other end is closed. The blow pipe is removed by "capping off" and the closed end is opened either by manipulations on the part of the blower before the capping off step, or the cylinder is allowed to cool without opening the closed end, and then the glass forming the closed end is removed by means of a hot thread. The last mentioned method is wasteful and is never practised unless the blower is unable to take the time required for the opening of the closed end by manipulation. When the blower opens the closed end by manipulation, after the cylinder has been blown to the desired length, the closed or shade end is held in the furnace and rotated so as to be heated, the cylinder being held at an angle to the furnace opening during rotation, so that the greatest heat is concentrated on a relatively small central area, *i. e.*, an area concentric with the cylinder. During this operation the blower usually keeps the cylinder filled with air and holds his hand over the blow pipe so that the air may not escape but is compelled to expand, with the result that the internal pressure thereby created blows out the concentrated heated area, after which the blower must swing the cylinder in the swing pit until the opening has enlarged to the diameter of the cylinder, and the curved wall of the closed end has moved out parallel with the wall of the cylinder. This method is objectionable because the blower must expose himself to the intense heat of the furnace while heating the end of the cylinder and the physical strain is more or less severe. The object of the present invention is to provide a method by which the closed end of the cylinder may be blown open by the blower without exposing himself to the intense heat of the furnace and the physical strain incident thereto, and by which he is enabled to produce more perfect and uniform results than is possible by the method now in vogue.

In practising the invention, after the blowing of the cylinder has been completed in the usual well known manner, the blower holds the closed end of the cylinder in a position which will permit a very small pointed gas flame to concentrate its heat at the center or the apex of the closed end, for a short time, from fifteen to thirty seconds. By keeping the cylinder full of air and holding his hand over the end of the blow pipe, the blower is able to create a pressure within the cylinder and by then holding the closed end opposite the furnace opening for a few seconds, (an infinitesimal time as compared with the old methods), the expanding gases force open the heated area at the apex, whereupon the blower then swings the cylinder in the usual way to spread the opening.

The advantage of this method is that the cylinder may be permitted to cool to a much greater degree than is possible where the old method is practised, the blower is not exposed to the intense heat of the furnace for as great a period, and by reason of being able to concentrate the gas flame exactly on the apex of the closed end, more uniform results are obtained.

Having thus explained the nature of the invention, and described an operative manner of practising the same, although without attempting to set forth all of the forms in which it may be carried out, or all of the forms of its use what is claimed is:—

1. A method of opening the shade end of hand blown rollers comprising applying heat to a small area at the apex of said closed end and confining the heat to said area, and causing the gases within the roller to expand until said small heated area blows open.

2. A method of opening the shade ends of hand blown rollers comprising applying heat to a small area at the apex of the shade

end and confining the heat to said area, while the roller is filled with air, and then subjecting the entire end to heat until the softened area at the apex blows open.

3. A method of opening the shade ends of hand blown rollers comprising applying a small gas flame to a localized area at the apex of the shade, while the roller is filled with air, and then subjecting the entire shade end to heat until said localized area blows out.

4. A method of opening the shade ends of hand blown rollers comprising applying a small gas flame to a localized area at the apex of the shade for a period of fifteen to thirty seconds, while the roller is filled with air, and then subjecting the entire shade end to heat until said localized area blows out.

In testimony whereof I have hereunto set my hand.

CHARLES F. WARRICK.