be problematic for the separation of canes from a filament. If chips or blemishes do arise at the cleaved surfaces, it may not be possible to successfully draw the cane into a fibre, because cracks may propagate from the flaws. Also, debris may be deposited on and around the cane end. This is a particular risk for fibre structures comprising one or more lumina, since debris may enter the lumina. Debris can cause defects in fibre subsequently drawn from the cane, which may manifest as increased optical loss or mechanical weakness of the fibre. All these issues can require the scrappage of significant lengths of fibre and cane, thus reducing yield and increasing cost.

An additionally issue is potential perturbation of the glass filament if cane separation is carried out in a draw tower as the filament is formed. Perturbation may locally change the diameter of the cane from the desired diameter.

JP 2000063140 describes apparatus for producing an optical fiber preform that heats and draws a large-scale optical fiber preform to form a drawn part, and melting and cutting off the drawn part to a fixed length using a mechanism having a preheating part and a heating part.

US 2004177652 describes a method for manufacturing a glass rod which is a parent material of an optical fiber, comprising adjusting a vertical inclination of a standard rod having a predetermined straightness, and heating and elongating a base material which is a parent material of the glass rod along an axis of the standard rod, the vertical inclination of which is adjusted, to generate the glass rod.

Accordingly, alternative methods of processing glass filament to separate canes from the filament are of interest.

SUMMARY OF THE INVENTION

Aspects and embodiments are set out in the appended claims.

According to a first aspect of certain embodiments described herein, there is provided a method of processing glass filament, comprising: providing a length of glass filament from which a portion is to be separated from the remainder of the filament, the filament having an internal structure comprising one or more longitudinal lumina; directing energy, in the form of one or more laser beams or flames or plasma beams applied to the filament, onto the filament in order to cause a decrease in a width of the filament at a desired location for separation of the portion; and moving the portion away from the remainder of the filament to obtain the portion separated from the remainder of the filament, the separated portion forming a cane able to be drawn into optical fibre.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the invention and to show how the same may be carried into effect reference is now made by way of example to the accompanying drawings in which:

Figure 1 shows a flow chart of a method for processing a glass filament according to an example of the present disclosure;

Figure 2 shows a perspective side view of a glass filament to which methods of the present disclosure may be applied;

Figures 3A, 3B and 3C show transverse cross-sectional views of example filaments such as that of Figure 2;

Figure 4 shows a schematic side view of apparatus for processing a filament according an example of the present disclosure;

Figure 5A shows a schematic representation of an example energy source and beam directing system which may be included in the apparatus of Figure 4;

Figure 5B shows a cross-sectional view of an elongate focussed spot of an energy beam generated by the beam directing system of Figure 5A;

Figures 6A, 6B and 6C show schematic representations of further examples of an energy source and beam directing system which may be included in the apparatus of Figure 4;

Figure 7 shows a schematic side view of alternative apparatus for processing a filament according to an example, at an intermediate point of a processing method performed on a glass filament;

Figure 8 shows a schematic side view of the apparatus of Figure 7 or Figure 4, at a further intermediate point in a processing method that includes the use of crimping jaws;

Figure 9 shows a schematic side view of the apparatus of Figure 7, at an end point of the processing method showing a cane portion separated from the filament;