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- (71) Applicant: **UNIVERSITY OF SOUTHAMPTON**  
[GB/GB]; Highfield, Southampton Hampshire SO17 1BJ (GB).
- (72) Inventors: **SLAVIK, Radan**; c/o University of Southampton, Research & Innovation Services, University of Southampton, Room 2045, Building 28, Highfield Campus, University Road Southampton Hampshire SO17 1BJ (GB). **RICHARDSON, David John**; c/o University of Southampton, Research & Innovation Services, University of Southampton, Room 2045, Building 28, Highfield Campus, University Road Southampton Hampshire

SO17 1BJ (GB). **POLETTI, Francesco**; c/o University of Southampton, Research & Innovation Services, University of Southampton, Room 2045, Building 28, Highfield Campus, University Road Southampton Hampshire SO17 1BJ (GB). **BRADLEY, Thomas David**; c/o University of Southampton, Research & Innovation Services, University of Southampton, Room 2045, Building 28, Highfield Campus, University Road Southampton Hampshire SO17 1BJ (GB). **TARANTA, Austin**; c/o University of Southampton, Research & Innovation Services, University of Southampton, Room 2045, Building 28, Highfield Campus, University Road Southampton Hampshire SO17 1BJ (GB). **NUMKAM-FOKOUA, Eric**; c/o University of Southampton, Research & Innovation Services, University of Southampton, Room 2045, Building 28, Highfield Campus, University Road Southampton Hampshire SO17 1BJ (GB).

(74) Agent: **MCGOWAN, Cathrine**; D Young & Co LLP, 120 Holborn, London EC1N 2DY (GB).

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(54) Title: OPTICAL TIME DOMAIN REFLECTOMETRY FOR HOLLOW CORE OPTICAL FIBRES

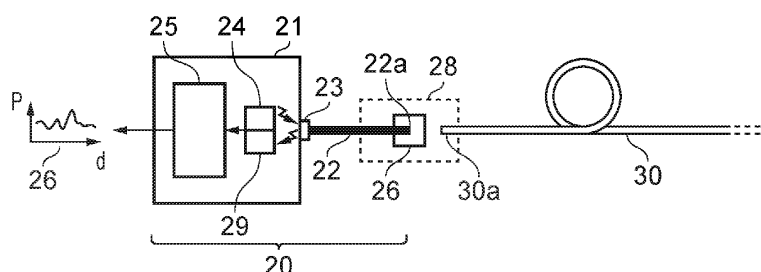


FIG. 11

(57) Abstract: A method of assessing an optical system comprising a hollow core optical fibre comprises providing an optical time domain reflectometry system comprising: an optical source configured to generate optical pulses with wavelength  $\lambda$ ; an optical detector configured to detect light at wavelength  $\lambda$ ; and an input/output fibre comprising a solid core optical fibre optically coupled at a proximal end to receive optical pulses from the optical source and deliver light to the optical detector, and having at its distal end an end facet with an applied treatment configured to suppress back-reflection of light at wavelength  $\lambda$  caused at an interface of glass forming the core of the solid core optical fibre and air at the end facet; aligning the distal end of the input/output fibre with a proximal end of a hollow core optical fibre having gas present in the hollow core, for optical transmission between the input/output fibre and the hollow core optical fibre; operating the optical source to generate optical pulses for propagation along the input/output fibre and into the hollow core fibre; receiving backscattered light produced by Rayleigh scattering of the optical pulses from the gas in the hollow core of the hollow core fibre and detecting the backscattered light with the optical detector to generate a detected signal; and processing the detected signal to create an optical time domain reflectometry profile comprising a distribution of backscattered optical power along a length of the hollow core optical fibre.

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