

DR. NARINDER SINGH KAPANY

FATHER OF FIBER OPTICS



ONE OF THE SEVEN UNSUNG HEROES OF THE 20TH CENTURY

– FORTUNE MAGAZINE (1999)

50+

Research Papers

100+

Patents



1954

Demonstrated high-resolution images could be transmitted via a **bundle of fine glass fibres** and used them to build a flexible **fibrescope**

A Flexible Fibrescope, using Static Scanning

An optical unit has been devised which will convey optical images along a flexible axis. The unit comprises a bundle of fibres of glass, or other transparent material, and it therefore appears appropriate to introduce the term 'fibrescope' to denote it. An obvious use of the unit is to replace the train of lenses employed in conventional endoscopes. The existing instruments of this kind, for example, cystoscopes, gastroscopes and bronchoscopes, etc., consist of a train of copying lenses and intermediate field lenses. They are either rigid or have only limited flexibility. Moreover, the image quality of these systems is poor, since they consist only of positive lenses which give rise to a very large curvature of field. In existing gastroscopes the total number of lenses employed may be as many as fifty, and in consequence the light transmission is poor, due to the total glass path and the number of air-glass surfaces, in spite of blooming. Even more important in this respect, however, is the need to use small relative apertures for such instruments, this being necessary if acceptable

Jan. 16, 1962

N. S. KAPANY
METHOD AND MEANS FOR TRANSMITTING IMAGES THROUGH
A BUNDLE OF TRANSPARENT FIBERS

3,016,785

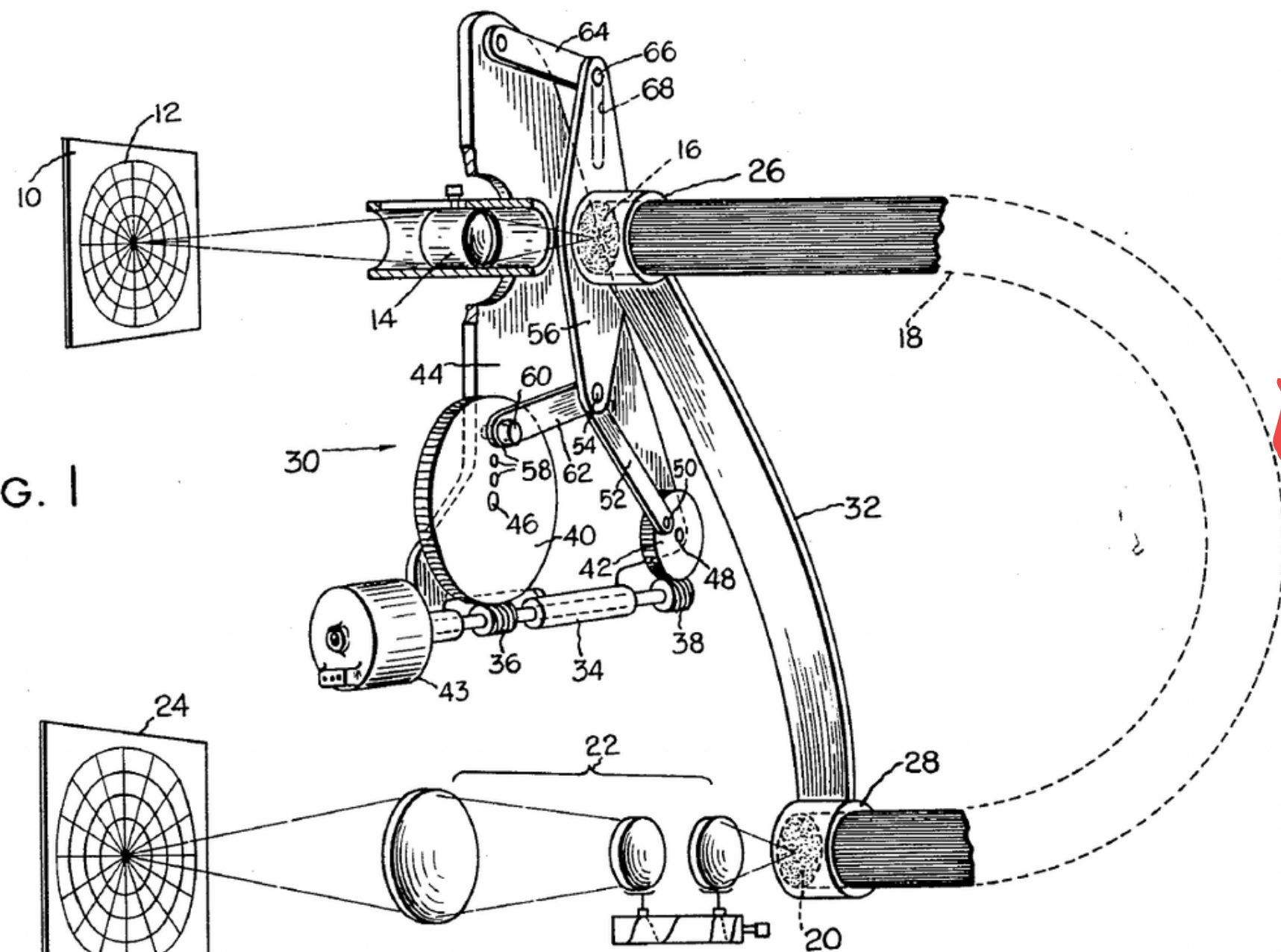
Filed May 20, 1957

3 Sheets-Sheet 1

Exemplary Patent

US3016785A

FIG. 1



Flexible bundle of fibers

INVENTOR,
NARINDER S. KAPANY
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ATTORNEYS

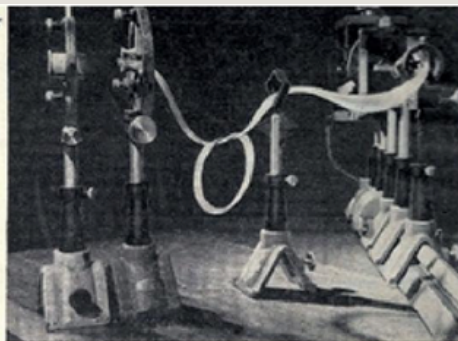
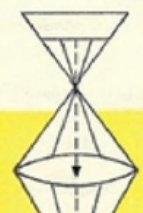
1955

FEATURED IN THE POPULAR MECHANICS MAGAZINE

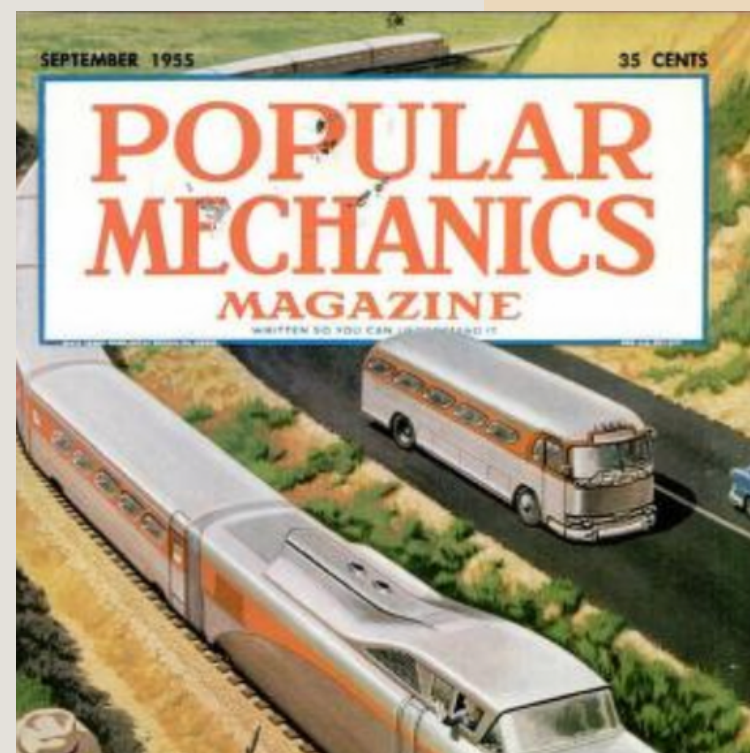
Popular Mechanics - Sept '55

Rope 'Scope

GLASS FIBERS finer than human hair make up the chief part of an optical instrument that can see around corners. The fibers are aligned in a rope bundle. By looking along the axis of the fibers, you can see an image at the other end, no matter how the rope is looped or twisted. Doctors may use it in internal examinations of the human body. Scientists could observe radioactive materials shielded behind lead walls and engineers could use it to investigate concealed parts of complex machinery. Known as the Fibrescope, it was developed by Dr. H. H. Hopkins and a 27-year-old Punjabi, Dr. Narinder Singh Kapany, at the Imperial College of Science in London. The simple instrument may replace expensive optical systems which are bulky and inflexible.



Even when a loop has been tied in the fiber, image at one end can be seen through a lens placed at the other end. Below, Dr. Narinder Singh Kapany adjusts the machine which aligns the glass fibers. Kapany, a 27-year-old Punjabi, is co-developer of the Fibrescope.



Coined the term: **Fiber Optics**

1960



FIBER OPTICS

If light is directed into one end of a glass fiber, it will emerge at the other end. Bundles of such fibers can be used to conduct images over a tortuous path and to transform them in various ways.

by Narinder S. Kapany

2021

Received India's second
highest civilian award the
Padma Vibhushan
posthumously

