



New connection on: : 02-03-2018 : 20:50:31 - Last disconnection on: : 02-03-2018 : 20:50:31

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

Welcome to EPOQUE Rebuild under the Production Environment

[EPODOC: SS 33] lens and polariz+

Results in EPODOC **18.860**

[SS 34] 33 and wire

Results in EPODOC **193**

[SS 35] 34 and polymer+

Results in EPODOC **0**

[SS 36] 34 and (pattern or ridge or hollow or protrusion or groove or valley or microstruct+)

Results in EPODOC **11**

[SS 37] ..li



1/11 © EPODOC / EPO

PN - [WO2017151291](#) A1 20170908

PR - US201662303969P
20160304; US201662401451P
20160929

AP - WO2017US17319 20170210

DT - *; Rep

CT - |KR| ISR (A1)
[US2004169924](#) A1 20040902
[XY] (FLAGELLO DONIS [US], et al)
[X] 1-6, 12-15
* See paragraphs [0014], [0030],
[0062]-[0065], [0071], [0077]
-[0084]; and figures 1, 4, 8-9. *
[Y] 7-11;
[US2013153534](#) A1 20130620
[Y] (RESNICK DOUGLAS J [US], et
al)
[Y] 7-11
* See paragraph [0038]; claim 1;
and figure 6A. *;
[EP1684099](#) A2 20060726 [A] (LG
ELECTRONICS INC [KR])
[A] 1-15
* See figures 1-4. *;
[US2007165307](#) A1 20070719
[A] (PERKINS RAYMOND T [US])
[A] 1-15
* See figures 1a-2, 9a. *;
[US2008094547](#) A1 20080424
[A] (SUGITA TATSUYA [JP], et al)
[A] 1-15
* See figures 1-3. *

CCI - [G02B1/11](#) ; [G02B5/3058](#)

PA - APPLIED MATERIALS INC [US]

TI - **WIRE GRID POLARIZER**
MANUFACTURING METHOD

AB - The present disclosure generally
relates to systems and methods
for manufacturing **wire**
grid **polarizers** for LCDs using
interference lithography, which
are also useful for generating
large-area grating patterns. In
one embodiment, a method
includes depositing a bottom
anti-reflective coating layer over
an aluminum coated flat panel

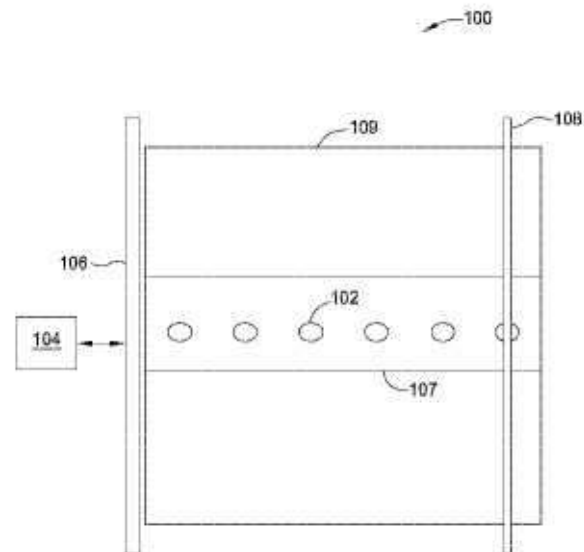


FIG. 1

display substrate, depositing a photoresist layer over the bottom anti-reflective coating layer, and exposing the photoresist layer with an image from a phase grating mask. The exposure with the phase grating mask is done by imaging the ± 1 diffraction orders from the phase grating mask onto the substrate using a half Dyson optical system. A plurality of half Dyson systems are generally used in parallel to **pattern** fine geometry lines and spaces of a **wire grid polarizer** for a large area substrate. Each half Dyson system includes a primary mirror, a positive **lens** and a reticle.

2/11 © EPODOC / EPO

- PN - [KR20100133130](#) A 20101221
- PNFP - KR101041678B B1 20110614
- PR - KR20090051853 20090611
- AP - KR20090051853 20090611
- DT - I
- CT - || STSE (B1)
[JP2007171802](#) A 20070705 [] (SEIKO EPSON CORP);
[KR20080062471](#) A 20080703 [] (CHEIL IND INC [KR])
- PA - (A)
TORAY ADVANCED MAT KOREA INC [KR]
- TI - (A B1)
HIGH LUMINANCE MULTIFUNCTIONAL SHEET
- AB - (A)
PURPOSE: A high luminance multifunctional sheet is provided to maximize light concentration efficiency through recursive reflection with a reflection layer.
CONSTITUTION: A light emitting unit is comprised of a plurality of lenses which are arranged on a transparent member(1) while being adjacent to each other. A light incidence unit(3) has a **protrusion** at opposite position to the contact area of the transparent member. A **wire grid polarizer** is formed between a reflecting layer and the **protrusion**. The bottom of the **lens** has a triangular cross section of a prism shape. The center of the **lens** excluding the bottom of the **lens** includes a spherical surface or an ellipse shape.

3/11 © EPODOC / EPO

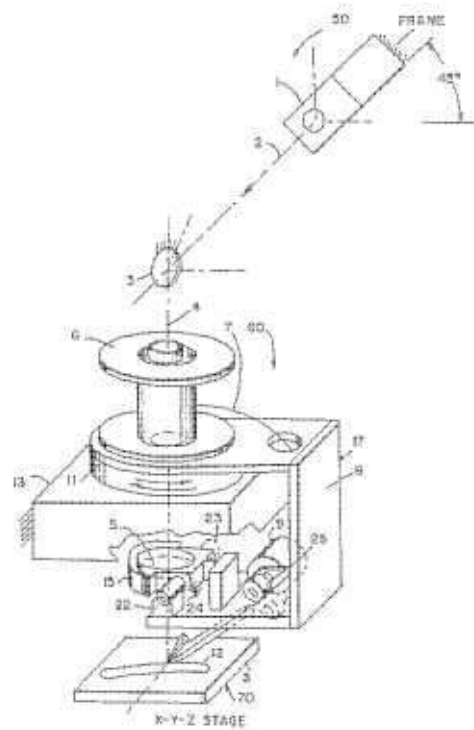
PN - [US5578227](#) A 19961126

PR - US19930113241
19930830; WO1996US19744
19961122

AP - US19930113241 19930830

DT - *; Rep

CT - || STSE (A)
[US1533300](#) A 19250414 [] (RALPH BAKER);
[US3156968](#) A 19641117 [] (WHITE JR WILLIAM D);
[US3558846](#) A 19710126 [] (UJIIE AKIRA);
[US3737616](#) A 19730605 [] (UJIIE A);
[US3821840](#) A 19740702 [] (KERSHAW J);
[US3952180](#) A 19760420 [] (GNANAMUTHU DANIELS);
[US4323756](#) A 19820406 [] (BROWN CLYDE O, et al);
[US4575330](#) A 19860311 [] (HULL CHARLES W [US]);
[US4743733](#) A 19880510 [] (MEHTA PAUL P [US], et al);
[US4803334](#) A 19890207 [] (BURKE MICHAEL A [US], et al);
[US4841617](#) A 19890627 [] (SCHMIDT MARTIN [DE], et al);
[US4857693](#) A 19890815 [] (RUMP JEROME R [US]);
[US4863538](#) A 19890905 [] (DECKARD CARL R [US]);
[US4931125](#) A 19900605 [] (VOLKMANN CURTIS L [US], et al);
[US4947463](#) A 19900807 [] (MATSUDA JUN [JP], et al);
[US5038014](#) A 19910806 [] (PRATT VANON D [US], et al);
[US5121329](#) A 19920609 [] (CRUMP S SCOTT [US]);
[US5134569](#) A 19920728 [] (MASTERS WILLIAM E [US]);
[US5147587](#) A 19920915 [] (MARCUS HARRIS L [US], et al);
[US5208431](#) A 19930504 [] (UCHIYAMA FUTOSHI [JP], et al);



[US5233150](#) A 19930803 [
] (SCHNEEBELI FRITZ [CH], et al);
[US5266139](#) A 19931130 [
] (YOKOTA MICHAEL J [US], et al);
[US5303141](#) A 19940412 [
] (BATCHELDER JOHN S [US], et al);
[CA678500](#) A 19640121 [
] (CONTINENTAL MACHINES);
[FR2583333](#) A1 19861219 [
] (CILAS ALCATEL [FR]);
[DE3905684](#) A1 19900830 [
] (DRAUGELATES ULRICH PROF DR
 ING [DE]);
[JPH0299286](#) A 19900411 [
] (MAZDA MOTOR);
[JPH04288974](#) A 19921014 [
] (NIPPON TELEGRAPH &
 TELEPHONE);
[WO8806564](#) A1 19880907 [
] (THOMSON CSF [FR])

CTNP - || STSE (A)
 [] -
 Laser Solves Spotwelding
 Problems by Schaffer in pp. 337
 340 of Source Book on Electron
 Beam and Laser Welding, Mar.
 1983.

CCI - [B23K26/32](#) ; [B23K26/324](#) ;
[B23K26/34](#) ; [B29C64/141](#)

CUI - [B33Y10/00](#) ; [B33Y30/00](#) ;
[B33Y50/02](#)

CCA - [B29C2791/005](#) ; [B23K2203/50](#)

TI - Rapid prototyping system

AB - A model making method and
 apparatus projects a
 linearly **polarized** laser beam
 from a laser source onto a
 mirror for circularly **polarizing**
 the beam and directing the
 circularly **polarized** beam
 vertically toward a rectilinearly
 movable stage for fusing a
 rectangular **wire** to a substrate
 or a previously fused **wire** layer
 on the stage. The
 circularly **polarized** beam
 projects through a center of a
 spool and a rotary stage and a

support for the rotary stage and a rotary arm which is mounted on the rotary stage. The rotary arm supports a stepper feeder which draws the **wire** from the spool and pushes the **wire** through a nozzle, which radiuses the **wire** so that it lies flat and releases the **wire** near a focused spot of the circularly **polarized** laser beam. The rotating arm carries a **lens** mount on a pivot so that the **lens** which focuses the beam may traverse the **wire** for cutting the **wire**. Movement of the rectilinearly movable stage in a X-Y direction is controlled by a computer and stepper motors to follow a predetermined **pattern** of a cross-section of the model. The rotary arm turns on the rotary stage to release the **wire** tangentially to curvatures in the model outline. After each complete layer, the stage is stepped downward one **wire** thickness and the next layer is formed. The nozzle includes a gas jet passage for flooding the **wire** with inert gas as it is fused.

4/11 © EPODOC / EPO

PN - [JPS62195688](#) A 19870828
 PR - JP19850209947 19850925
 AP - JP19850209947 19850925
 DT - I
 FI - B41J2/47&101D; B41J3/00&D; G03G15/04
 FT - 2C062/FA04; 2C062/FA17; 2H076/AB05; 2H076/AB08; 2H076/AB11; 2H076/AB21
 PA - HITACHI LTD
 TI - OPTICAL INFORMATION GENERATOR
 AB - PURPOSE:To generate a large capacity of light information by using a small- sized optical system by conducting light to a photoconductive layer of an electrooptic crystal press-welded with a substrate constituting electrodes and subjecting the luminous flux passing said layer to spatial phase modulation. CONSTITUTION:Laser light 7 **polarized** in parallel in the Z direction is conducted to the photoconductive layer 9 by the

diffusion of Ti on the surface of the electrooptic crystal 8 (for example, LiNbO₃ of Y-cut). The substrate which is disposed with plural pieces of electrode wires 10 in the Z direction as the arranging direction and is formed with a **pattern** by 2 pieces each is press-welded to the surface of the crystal 8. The luminous flux passing between the wires 10 is subjected to the spatical phase modulation by the wires 10. Part of the right distribution expanded by the diffraction of the phase-modulated luminous flux is shut off by an aperture by a slit 11 disposed on the focal plane of a **lens** 12 and the light past the aperture is imaged on the screen 6, by which the light information with the plural times the min. inter-electrode **wire** space as a min. unit is generated.

5/11 © EPODOC / EPO

PN - [JPH04341931](#) A 19921127
 PR - JP19910113569 19910518
 AP - JP19910113569 19910518
 DT - I
 FI - G11B7/08&A; G11B7/125; G11B7/125&A; G11B7/125&D
 FT - 5D117/AA00; 5D117/HH01; 5D117/KK01; 5D119/AA38; 5D119/AA43; 5D119/FA05; 5D119/FA35; 5D119/FA37; 5D119/NA04; 5D789/AA38; 5D789/AA43; 5D789/FA05; 5D789/FA35; 5D789/FA37; 5D789/NA04
 PA - FUJI ELECTRIC CO LTD
 TI - METHOD AND DEVICE FOR POSITIONING LASER DIODE FOR OPTICAL HEAD
 AB - PURPOSE:To correct the angular deviation of linearly **polarized** light in a major axis direction by moving straight a retaining plate in a tangential direction in relation to the radius of rotation of a positioning **groove**, and rotating a laser diode by a very small angle. CONSTITUTION:When a lead **wire** drawn out of the lead **wire** hole of the retaining plate 15 is connected to a control circuit, and the laser diode 1 is driven, the emitted linearly **polarized** light is converted into a parallel laser beam by a collimate **lens**. If the retaining plate 15 is fixed to a fitting plate 2 at a position where the major axis direction of the laser beam coincides with a prescribed direction after moving slightly the retaining plate 15 to the longitudinal direction of a slit 17 and rotating the diode 1 by the very small angle while monitoring this distribution of the intensity of light by a constant power diagram, etc., the angular deviation of the laser beam in the major axis direction can be easily and precisely corrected.

6/11 © EPODOC / EPO

PN - [GB868219](#) A 19610517

PR - FRX868219 19571129

AP - GB19580037898 19581125

DT - *

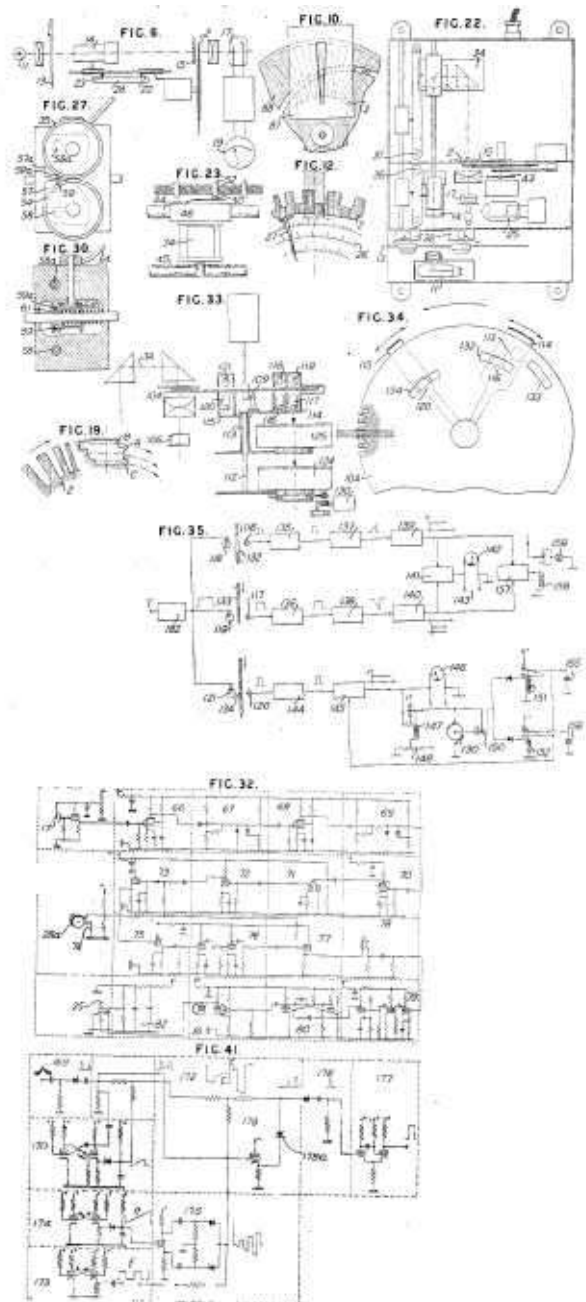
CCI - [G01B11/08](#)

IDT - 42B17P7

PA - OSCAR HENRI INGBER

TI - Device for measuring the width or diameter of fixed or movable tapes, wires, tubes, bars and the like

AB - 868,219. Photo-electric measurement of dimensions. INGBER, O. H. Nov. 25, 1958 [Nov. 29, 1957; May 5, 1958], No. 37898/58. Class 40(3) [Also in Groups XIX, XX, XXX, XXXV and XXXVII] The transverse dimension of a movable **wire**, cable, tube, tape, &c. is measured photoelectrically by apparatus comprising a source of luminous flux, at least one diaphragm between the source and photo-cell, a surface having successive zones of different transparency and an optical system forming an image of the object to be measured on the diaphragm. Light from a source 11 (Fig. 6) passes around the object 13 and an image is formed by an optical system 14 on the diaphragm 15. The output of the photocell 17 will depend on how much light is obscured by the object and is displayed on a meter 19. A toothed "modulator" disc 2 is interposed between the diaphragm and the photo-cell and normally the width of the image is equal to the pitch of the teeth so that the photo-cell output does not vary as the disc rotates. If the dimension of the object changes, the image will no longer occupy this space on the



modulator and a variation in photo-cell output will be obtained. The position of the lens 14 and/or the disc 2 is adjusted until the photo-cell output is constant once more, and the dimension is indicated by the distance between the pointers on the scale 24. The modulator can have a single aperture only, in which case the fluctuations are produced by reflecting the light beam from an oscillating mirror or by illuminating the object from a flying-spot scanner. In another modification (Fig. 10) the teeth are replaced by long radial slots which co-operate with a stationary disc 88 having a spiral aperture and another stationary disc 87 with a single radial slot. The angular position of the disc 88 is then adjusted until the width of the slot visible through the disc 87 is equal to half the width of the image. In another form (Fig. 12) the modulator teeth are of gradually increasing width so that the photo-cell output will be zero only once per revolution of the disc. By means of a stroboscopic lamp energized by the photo-cell output (see below) the particular tooth whose width equals half the image width is illuminated and can be indicated by a pointer 27 and movable scale 26; the scale can be stationary and the pointer movable. When the edges of the diaphragm are crossed by the edges of the slots in the disc an "interference" signal is generated, and this may be reduced by suitable choice of shape and dimensions of the diaphragm aperture. This aperture may be equal to a multiple of the pitch of the disc,

or may consist of two staggered portions of equal or unequal widths (Figs. 14-17, not shown), whereby two separate "interference" outputs are obtained which cancel one another. If the modulator teeth are of variable width (Fig. 19) it is necessary to have the diaphragm aperture in three portions of which one (A) is twice the depth of the others (B, C), the three being displaced relative to one another by an amount equal to an odd multiple of the mean width of the slots. The algebraic sum of the three interference signals generated is then much less than any one alone (Fig. 20, not shown). Alternatively the edges of the diaphragm may be inclined to those of the modulator, or their transparency may change gradually instead of abruptly; the low-frequency components of the output can then be eliminated electrically. Further, there may be injected an equal and opposite signal derived from a rotating magnetic or photographic track carried by the disc, or the beam may be compensated by another derived from a similar diaphragm displaced angularly. Such compensation is unnecessary if the whole of the luminous flux passes through the modulator disc. The modulator can be a cylinder instead of a disc. Machine construction (Fig. 22). Light from a source 11 passes round the object 13 and is focused by a **lens**-system 14 and prism-system 34 on to the diaphragm 15, behind which is the modulator disc 2 (of the type shown in Fig. 19) and photo-cell

17. A stroboscopic lamp 25 illuminates the scale(s) on the modulator disc viewed in conjunction with a reference mark 43. Knobs 36, 37 control the positions of the lens-system 14 and prism-system 34 to vary the size of the image. The prism-system (Fig. 23) is mounted on a block 46 which slides on a rail 44 and has rollers engaging another rail 45. A spring clip 50 engages a lock nut 52 to maintain the system in a given position. A similar arrangement is provided for the **lens**-system (Fig. 25, not shown). The **lens** and prism systems can thus be altered by predetermined amounts, and the scale viewed in conjunction with the modulator disc can be changed simultaneously. An auxiliary scale carries marks to indicate percentage deviation from a standard or from the initial value of the dimension of the object, an adjustable pointer being set accordingly before measurement starts. Indication can be effected by a dark line on a clear background or vice versa, or by the separation of two contrasting areas. The scale may be a flat disc or a drum, in which case the mark can be straight, curved or helical. The indication can be traced graphically and reproduced photographically by using a photosensitive layer. The **wire** or tape is guided by two devices 32 each comprising a plain roller 35 and a grooved roller 54 (Fig. 27) to which are attached segments 57, 57a pivoted at 58, 58a and secured by pins 59, 59a. These pins (Fig. 30) engage a spring-loaded member 61 and urge the rollers

into contact with one another. The rollers are disengaged by a lever 64 and cam 64b when the **wire** &c. is to be inserted or removed. Flexible pads or rollers (not shown) minimise vibration of the **wire** &c. If the latter travels through water at any stage, the effect of droplets on its surface can be avoided by passing it through a drying zone or by carrying out the measurement under water. Alternatively, a circuit can be included to block the photo-cell output when this changes abruptly. For objects such as tapes whose cross-section is not circular, the apparatus can be duplicated to measure the dimension in a different direction, or the object can be turned periodically. Alternatively a plurality of light beams from the same or different sources can be switched (mechanically or with a **polarizer**) to illuminate the object successively from different directions. Circuitry (Fig. 32). The photo-cell 17 receives light from a modulator of the type of Fig. 19, and its output is amplified at 66, 68 and 70, and passed through two symmetrical choppers 67, 69. A demodulator 71 removes most but not all of the A.C. component, and the residual signal is inverted at 72 and amplified at 73. A cam 28a is driven from the modulator shaft and by contacts 74 biases off valve 73 once per revolution for the period when the width of the modulator teeth visible changes abruptly. The remaining signal is demodulated at 75, amplified at 76 and again biased at 77 to complete the suppression of the interference

signal. The resulting short pulse is again demodulated at 78, amplified at 79 and used to trigger a monostable multivibrator 80. The output of the latter is chopped at 81, differentiated at 82 and fed to the stroboscopic lamp 25, which thus flashes whenever the output of the photo-cell is a minimum, i. e. when the width of the image is equal to the instantaneous pitch of the modulator teeth. The number corresponding to the measured dimension will then appear behind the pointer 43 through the reading gate (Fig. 22). Instead of a stroboscopic indication, the lamp can be energized from a bi-stable multivibrator over a period extending from the instant of minimum photo-cell current either backwards to the beginning of the cycle or forwards to the end of the cycle. The mean current supplied to the lamp, or to an auxiliary photo-cell illuminated thereby, is then a measure of the dimension and can be read on a meter or transmitted to a remote point. Remote indication can also be effected by feeding the lamp with alternating or pulsating current which is started or stopped when the photo-cell output is a minimum, and counting the pulsations. Alternatively, a remote indicating scale and lamp can be energized in synchronism with the local ones. Remote operation of the optical system and rangechanging can also be effected. The mean value of rapidly-varying readings can be obtained by allowing a phosphorescent screen to be illuminated with ultra-violet

rays from the flashing lamp.

Another method of measurement is to generate a linearly-varying voltage synchronized with the modulator and to determine its value when the photo-cell output is a minimum. This method is suitable when the modulator has only one aperture (see above) and the voltage can be the sweep voltage of the cathode-ray tube used as flying-spot scanner, or can be generated from the oscillating mirror by blocking a light beam falling on an auxiliary photo-cell, moving a plate of a capacitor forming part of a potential divider, or moving a coil in the field of another coil. The voltage representing the dimension is obtained on an integrating capacitor.

Alternatively, the number of pulses in the photo-cell output between the start of the cycle and the moment when the multivibrator is synchronized can be counted. It is stated that this method is less sensitive to vibration of the object being measured.. Determining deviation from standard, and maximum and minimum values.

In Fig. 33 the beam from the object passes through the modulator disc 104 to the photo-cell 106, and contacts 109 suppress the signals when the pitch of the disc changes abruptly, as before. Coaxial with the modulator disc is a shaft 112 inside a further **hollow** shaft 113, carrying arms 114, 115 respectively (see also Fig. 34). The modulator disc carries three arcuate slots 132, 133, 134 at different distances from its centre,

7/11 © EPODOC / EPO

PN - [GB1362340](#) A 19740807

PR - CH19710010555 19710717

AP - GB19720033020 19720714

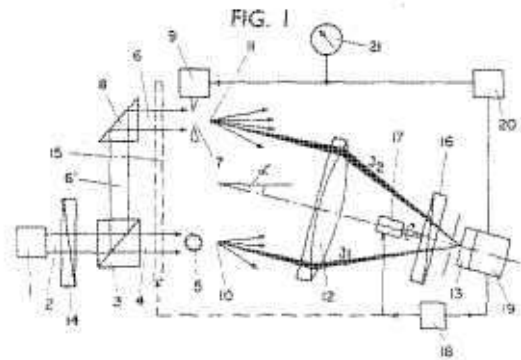
DT - **

CCI - [G01B11/105](#) ; [G01B11/00](#)

PA - BBC BROWN BOVERI & CIE

TI - METHOD OF MEASURING SMALL OBJECTS

AB - 1362340 Holograms; spacial filtering BBC BROWN BOVERI & CO Ltd 14 July 1972 [17 July 1971] 33020/72 Heading G2J [Also in Division G1] The dimensions of a test object and a reference object are matched by producing Fraunhofer diffraction patterns from each object and adjusting the real or apparent size of the reference object until the diffraction patterns are congruent. As shown, Fig.1 light from a laser 1 is split into two parallel beams 4 and 6 which respectively illuminate the test object 5, which is a **wire**, and the reference object 7, which is a slit of adjustable width. A **lens** 12 produces the Fraunhofer diffraction patterns of the two objects and a photo-multiplier or photo-diode 13 measures the intensity of the radiation at a point displaced from the centre of the **pattern**. The beams incident on the detector 13 are alternately switched to produce an alternating signal whose amplitude is proportional to the difference in intensity of the incident parts of the diffraction patterns. The signal is applied to a phase sensitive detector 19 connected to a servo unit 20 which provides a control voltage to adjust the width of the slit 7 by means of a Piezo-electric

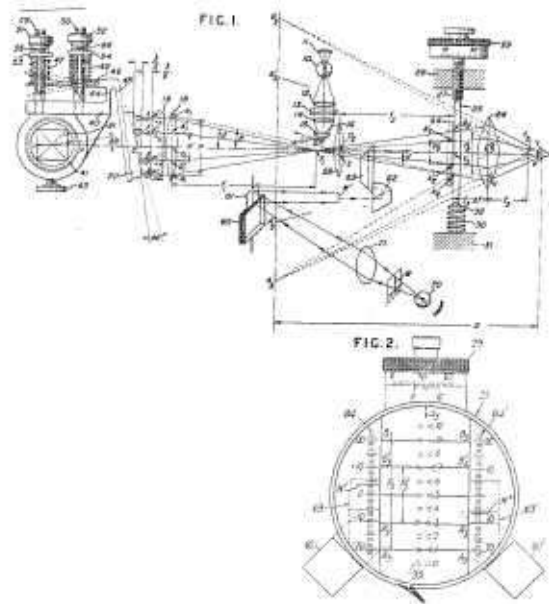


transducer 9 until the intensities of the detected portions of the diffraction patterns are equal, i. e. the patterns are congruent. With circular test objects the reference object may comprise a fixed circular aperture and a **lens** may be used to produce a real image the size of which can be varied by adjusting the longitudinal position of the **lens** by Piezo-electric transducer Fig.4 (not shown). The intensities of the diffraction patterns can be measured at a second off centre point to permit adjustments of the relative intensities to be made. The reference object may be complementary to the test object as described above or may be similar, the diffraction patterns being the same in both cases. The beam switching can be achieved (a) by using a beam splitter 3 which orthogonally polarises the emergent rays and a rotating polariser 16 (or 15), a linear **polarizer** 14 being inserted between the laser 1 and the splitter 3 to adjust the relative intensities of the beams; (b) by using a rotating shutter at position 15 or 16; (c) by using an orthogonally **polarizing** beam splitter 3 and inserting a Pockels cell followed by a **polarizer** in each of the beams; (d) by using a gas laser subject to Zeeman splitting, so that the plane of **polarization** rotates with the magnetic field, and an orthogonally **polarizing** beam splitter 3. In an arrangement to reduce noise, rotating **polarizers** directed orthogonally are inserted into the two beams and an orthogonally **polarizing** beam splitter is placed in front of two photo-detectors which therefore

receive anti-phase signals which can be subtracted to eliminate common mode noise. Electro-optical modulators may replace the rotating **polarizers**. Other light sources such as laser diodes, luminescent diodes and lamps of limited spectral distribution may be used together with narrow slits to provide spacial coherency and filters to provide a narrow spectral width as necessary.

8/11 © EPODOC / EPO

- PN - [GB911366](#) A 19621128
- PR - US19570690269 19571015
- AP - GB19580032750 19581014
- DT - **
- CCI - [G01N21/21](#) ; [G01B11/26](#) ; [G01C1/02](#)
- PA - DAYSTROM INC
- TI - Improvements in or relating to apparatus for measuring minute angular deflections
- AB - 911,366. Interferometers; polarimeters. DAYSTROM Inc. Oct. 14, 1958 [Oct. 15, 1957], No. 32750/58. Class 97 (1). In order to measure small angular rotations of, for example, a **polarizer** 21 in a polarimeter, the rotatable sleeve 41 carrying the **polarizer** is clamped at 43 to a frame 40, having integral therewith an arm 45. This arm carries a plane parallel transparent plate 20 (for example of black glass) spaced from a transparent plate 19. The adjacent surfaces of these plates have semireflecting coatings thereon and are illuminated by a light beam from a slit 15, this light beam being collimated by a **lens** 18. As a result an interference **pattern** is formed in



the plate 19 and an enlarged image thereof is produced by a telescope system 23, 24. In the focal plan of the **lens** 23 is disposed a reticle 25, having index markings 35 thereon, and being adjustable by a micrometric screw 29, so as to bring a marking 35 into coincidence with one of the observed fringes. By counting the number of fringes between any two index markings 35, the angle between plates 19 and 20, and hence the angular rotation of the **polarizer** 21, can be determined by the formula given in the Specification. On each side of the reticle 25 is disposed a further scale on which appears an image of a **wire** W reflected into a field of view by galvanometer 61 and prisms 62, 63. An initial adjustment of the fringe spacing is effected by operation of nuts 51, 52 on threaded members which pass through clearance holes in an arm 46 and are fixed in the frame 40, coil springs being provided between the nuts and arm 46. The arm is connected by arm 44 to the frame 40 and is also connected to the arm 45 so that deformation of arm 46 by rotation of the nuts results in alteration of the relative inclination of plates 19, 20. Specification 911,365 is referred to.

PN - [GB1275024](#) A 19720524
PR - US19700012789 19700219
AP - GB19710020971 19710419
DT - **
CCI - [H01S3/101](#) ; [G02F1/0333](#)
PA - IBM [US]
TI - LASER SYSTEM
AB - 1275024 Lasers INTERNATIONAL BUSINESS MACHINES CORP 19 April 1971 [19 Feb 1970] 20971/71 Heading H1C A laser cavity contains a fly's eye **lens** and an electro-optic system for transverse mode selection. In Fig. 2, the resonator comprises reflectors 15<SP>1</SP> and 32<SP>1</SP>, and contains lenses 16<SP>1</SP>, 30<SP>1</SP>, and the fly's eye **lens** 100<SP>1</SP>. The latter is an array of small converging lenses which may be stamped from a single glass or plastics sheet. The lenses 16<SP>1</SP>, 30<SP>1</SP> and 100<SP>1</SP> are positioned so that discrete modes such as 20<SP>1</SP> may be resonated. The active medium produces linearly **polarized** light due to its Brewster angle ends, and this in combination with a further **polarizer** 28<SP>1</SP> and an electro-optic KDP sheet 34<SP>1</SP> normally prevents resonator action. When a local field is produced in the KDP sheet by an electron beam 55<SP>1</SP> one of the transverse modes such as 20<SP>1</SP> is resonated because it is no longer attenuated by the **polarizing** system. Any one of a number of transverse modes corresponding to the lenslets of the fly's eye **lens** may thus be selected. In

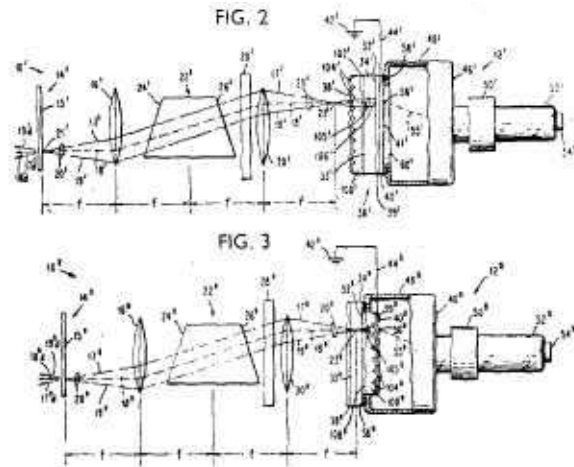
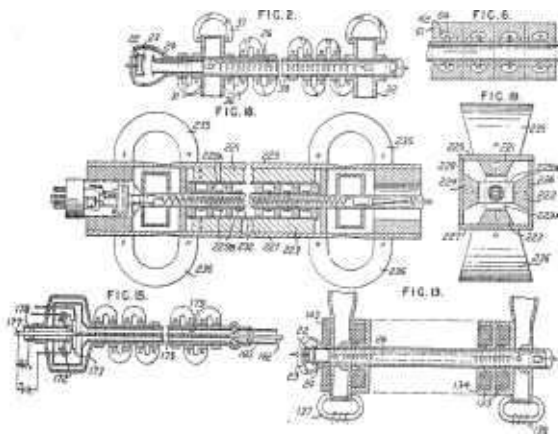


Fig. 3, the fly's eye **lens** is the other side of the KDP layer, and has its surface nearest the electron beam gun reflective to light; its action is as before. Suitable active media are an argon ion laser, a Nd doped YAG, or a **hollow** cathode ionized mercury laser. The latter comprises a glass tube containing a **hollow** cathode with a tantalum anode **wire** at each end. The Brewster windows may be replaced by a separate **polarizer**. The fly's eye **lens** avoids the need for focusing the resonated beam on to the KDP, and surface irregularities in the KDP are not important. It is stated that other mode selection devices such as the Kerr-Babinet scanlaser may also use the fly's eye **lens** in like manner.

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- PN - [GB757369](#) A 19560919
- PR - US19530351984 19530429
- AP - GB19540012311 19540428
- DT - **
- CCI - [H01J23/0873](#)
- PA - WESTERN ELECTRIC CO
- TI - Improvements in or relating to electron beam focusing systems
- AB - 757,369. Electron-beam apparatus. WESTERN ELECTRIC CO., Inc. April 28, 1954 [April 29, 1953 ; April 29, 1953 ; April 29, 1953; April 29, 1953], No. 12311/54. Class 39 (1). [Also in Group XXXV] An electron beam interacting with a wave transmission circuit is focused by a periodically varying magnetic field such that the longitudinal magnetic field in successive regions along the



beam reverses in direction. It is shown mathematically that a beam of oscillating crosssection is produced which will remain stable within limits provided the r.m.s. value of the longitudinal field is of the same order as the uniform field which would produce Brillouin focusing; diagrams are given of the stable and unstable regions of the Mathieu functions involved. The resultant concentration of the field gives a reduction of total stored energy and thus of magnet weight over the uniform field method. Permanent magnets or electromagnets may be employed. In a travelling- wave tube, the helix 26, Fig. 2, is surrounded by a number of pole-pieces 38 of any high permeability material, including ferrites, connected by alternately opposed horse-shoe magnets 36. The input and output waveguides 31, 32 have their opposed walls formed as polepieces bridged by magnets 37. A further **lens** surrounds the anode 24 of the electron gun 22, 23, 24. The pole-pieces may be discs joined by bar magnets or may themselves form components of a corrugated delay line. A number of axially **polarized** disc magnets may be spaced along the outside of the envelope. In another form the magnets 61, Fig. 6, are cylinders with an internal toroidal cavity 62 containing a few turns of **wire** 64 for initial magnetization. A succession of solenoids 133, Fig. 13, may co-operate with armatures 134 to produce the desired field when oppositely connected. The input and output waveguides may be similarly shaped and energized

by electromagnets 137, 138; and an initial focusing coil 143 is provided. The analysis shown to apply to cases where a **hollow** beam passes between the inner and outer conductors of a coaxial line, Fig. 14 (not shown), or outside (Fig. 15), or inside, Fig. 16 (not shown), a delay line, provided that in each case a radial electrostatic field is set up to simulate the space charge field of a solid beam. This may be done by applying a potential difference between the conductors of the coaxial line or by providing a separate field conductor such as 179, Fig. 15, which here is outside the line 175 but may be a rod inside it. A converging **hollow** beam is produced by annular cathode 172 and gun system 173. This arrangement permits direct axial input and output by lines 177, 178 and 182, 183, respectively. The line 175 is a grooved rod with impedance matching spacing of the grooves at the ends. An imbricated pole arrangement for producing the successive opposed fields by means of only four long magnets 221 ... 224, Figs. 18, 19, comprises a number of pole-pieces 229A, 229B, alternately bridging magnets 221, 223 and 222, 224. The field lines spread from a given pole-piece in opposite directions to the adjacent pole-pieces and back through a return circuit provided by rectangular casing 225 ... 228. Horseshoe magnets 235, 236 provide initial and final fields. A thin-walled magnetic cylinder 232 serves to smooth out the quadrupole components of the field. In a modification, Fig. 21

(not shown), only one diametral pair of magnets, such as 221, 223, is provided and the pole-pieces are connected alternately to these. The pole-pieces may form components of an interdigitated delay line. Specifications 669,474 and 726,823 are referred to.

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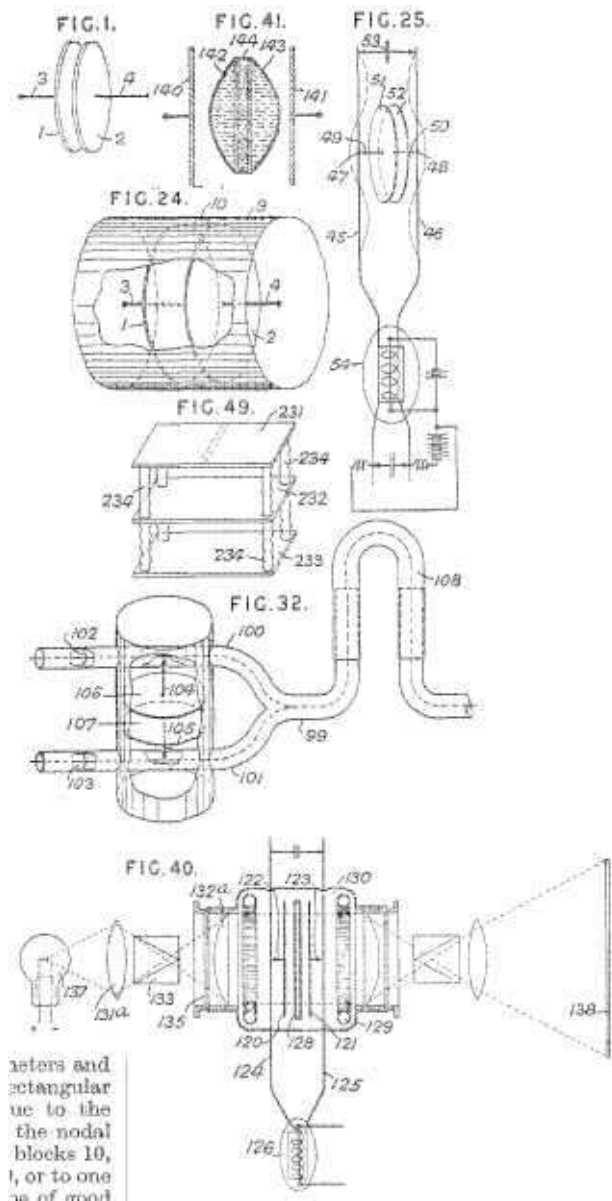
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PA - TERNION AG

TI - Improvements in devices for generating electromagnetic fields oscillating with quasi-optical frequencies

AB - <PICT:0417564/III/1>
Electromagnetic fields of quasi-optical frequencies are generated in the space between two oppositely-placed electrodes which are excited at one or more of their natural frequencies by an external high-frequency source. The electrodes are the seat of electromagnetic waves, after the manner of Lecher wires, but in two dimensions instead of one. The apparatus is applied for various purposes, including the chemical, physical, and biological processes referred to in Specification 417,501. The distribution of electric stress in the dielectric may be made visible by a **polarized-light** projection system. Fig. 1 shows a resonator comprising parallel circular plates 1, 2 excited by high-frequency voltages applied by the conductors 3, 4. The plates may be of square or



rectangular form, and may be inclined to each other. One or both may be concave or convex on its inner surface. Current and voltage waves are propagated along the plates in the same manner as along Lecher wires. With circular plates excited at their centres and with their rims free, the fundamental <PICT: 0417564/III/2> <PICT: 0417564/III/3> <PICT: 0417564/III/4> <PICT: 0417564/III/5> oscillation gives a voltage peak and a current node at the rim. If the rims are short-circuited by added capacity, as for instance by inserting the resonator in a metal cylinder 9, Fig. 24, the voltage peak and current node are at the centre. The plates also resonate at higher frequencies, with nodal diameters and nodal concentric circles. With rectangular plates, nodal lines parallel or oblique to the edges are created. The positions of the nodal lines may be predetermined by metal blocks 10, Fig. 24, fixed to the external cylinder 9, or to one of the plates 1, 2. The plates may be of good conducting metal, or of poorly-conductive metal with or without a coating of good conductivity; or the plates may be in the form of containers filled with an electrolyte. The plates may be light-permeable, consisting of glass with a very thin coating of precious metal on their inner or outer faces. One or both plates may also be in the form of **wire** grids stretched across rings of insulating material and electro-plated with copper or silver to provide good conductivity where the wires cross. The resonator

plates are excited by separate generators of damped or undamped waves. Fig. 25 shows a valve generator 54 with Lecher-**wire** output circuit 45, 46 tuned by a condenser bridge 53, and with the resonator 51, 52 loosely coupled thereto by two air gaps between small spheres 47--50. The coupling condensers may take the form of a ball and ring, or of small parallel plates at adjustable distance. The couplings may be slidable along the wires 45, 46, and along the resonator plates. The Lecher wires may be in the form of a **wire** and concentric tube, and they may be provided with knot extremities for coupling to the edge of the resonator plates. By inserting the Lecher wires between the resonator plates, an inductive coupling may be provided. In Fig. 32, the concentric-tube Lecher system 99 is adjusted in length by a trombone slide 108 and is tuned by reflection bridges 102, 103 placed in the divided branches 100, 100. The coupling conductors 104, 105 of the resonator 106, 107 project into the interior of the conduits. When liquid to be treated is contained in a glass envelope 128, Fig. 40, placed between the plates 120, 121 of the resonator, the dielectric is composed of layers of air glass and liquid. The Specification discusses the effect of the composite dielectric on the natural frequencies and the damping of the resonator. The distribution of electric stress in the liquid may be rendered visible by the apparatus of Fig. 40. The resonator plates are coupled by rods 122, 123 to

Lecher wires 124, 125 fed by a valve generator 126. Temperature may be regulated by heating-coils 129 within the casing 130. Light from a source 137 which may be a mercury vapour lamp is projected through **lens** 131<a>, **polarizing-prism** 133, mica plates 135 and **lens** 132<a>, and after passage through the treated liquid 128 emerges through similar devices to the screen 138, giving thereon a picture of the field distribution within the resonator. If the exciting oscillation is modulated, a complex varying **pattern** is produced. Glass or liquid lenses 142, 143, Fig. 41, may be arranged between the container 144 for the liquid under treatment and the resonator plates 140, 141. If convex as shown the lenses tend to equalize the field over the whole area whilst concave lenses concentrate the field in the centre. The lenses may be attached to the container 144 or the plates 140, 141. The resonator may be housed in a double-walled cylindrical casing with external knobs and dials for screw adjustment of the plate gap. Heating coils and coils for spraying cooling liquids into the casing are provided. Lecher wires of the concentric type are led through the container walls to excite the resonator, and high tension may be applied through chokes. The resonator plates may take the form of shelves 231--233, Fig. 49, separated by insulating posts 234, the material to be treated, for example foodstuffs, being placed upon the shelves. Energy may be

led to the shelves by Lecher **wire**
systems terminating in knobs
adjacent to the edges of the
shelves.

[SS 37]