



US006285500B1

(12) **United States Patent**  
**Ranalli et al.**

(10) **Patent No.:** **US 6,285,500 B1**  
(45) **Date of Patent:** **Sep. 4, 2001**

(54) **WAVELENGTH SELECTIVE SWITCH**

(75) Inventors: **Eliseo R. Ranalli**, Irvine; **Bradley A. Scott**, Huntington Beach, both of CA (US)

(73) Assignee: **Corning Incorporated**, Corning, NY (US)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/450,142**

(22) Filed: **Nov. 29, 1999**

**Related U.S. Application Data**

(60) Provisional application No. 60/141,556, filed on Jun. 29, 1999.

(51) **Int. Cl.**<sup>7</sup> ..... **G02B 5/30**

(52) **U.S. Cl.** ..... **359/497**; 359/127; 359/494; 359/499; 385/11

(58) **Field of Search** ..... 359/124, 127, 359/128, 130, 246, 494, 495, 497, 499; 385/11

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

4,783,851 \* 11/1988 Inou et al. .... 359/495

4,917,452	4/1990	Liebowitz .
5,377,026	12/1994	Liu et al. .
5,414,540	5/1995	Patel et al. .
5,606,439	2/1997	Wu .
5,694,233	12/1997	Wu et al. .
5,724,165	3/1998	Wu .
5,867,291	2/1999	Liu et al. .

**FOREIGN PATENT DOCUMENTS**

WO9833289	7/1998	(WO) .
WO9835251	8/1998	(WO) .

\* cited by examiner

*Primary Examiner*—Darren Schuberg

(74) *Attorney, Agent, or Firm*—Daniel P. Malley

(57) **ABSTRACT**

A reconfigurable bi-directional wavelength selective switch is disclosed. It has an optical system that is symmetric about a polarization modulator. The symmetric optical system consists of an input birefringent optical system and output birefringent optical system disposed around polarization modulator. The optical system delivers the wavelength channels that are to be switched as a superimposed wavelength channel incident the polarization modulator. As a result, crosstalk is reduced below -35 dB and greater optical performance is achieved.

**35 Claims, 9 Drawing Sheets**

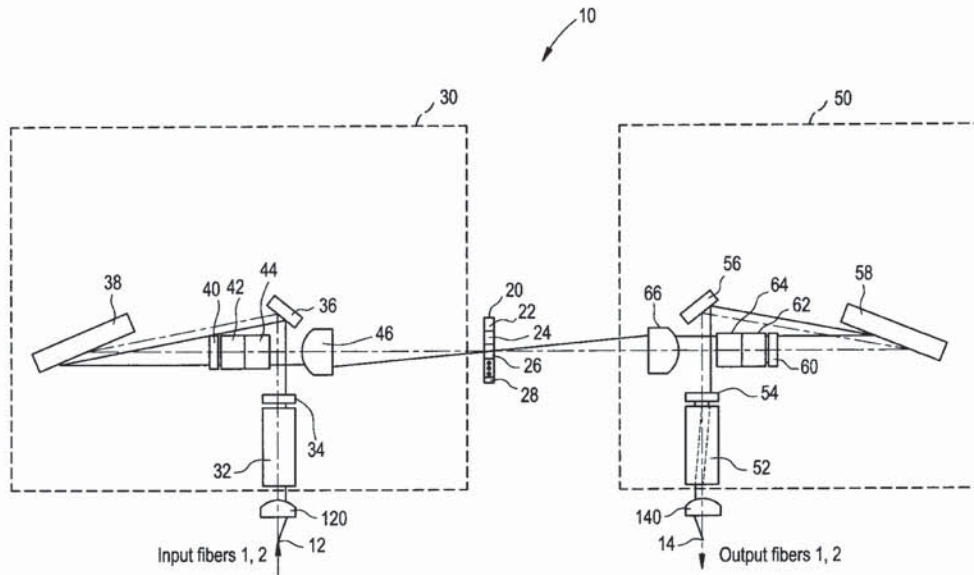


FIG. 1

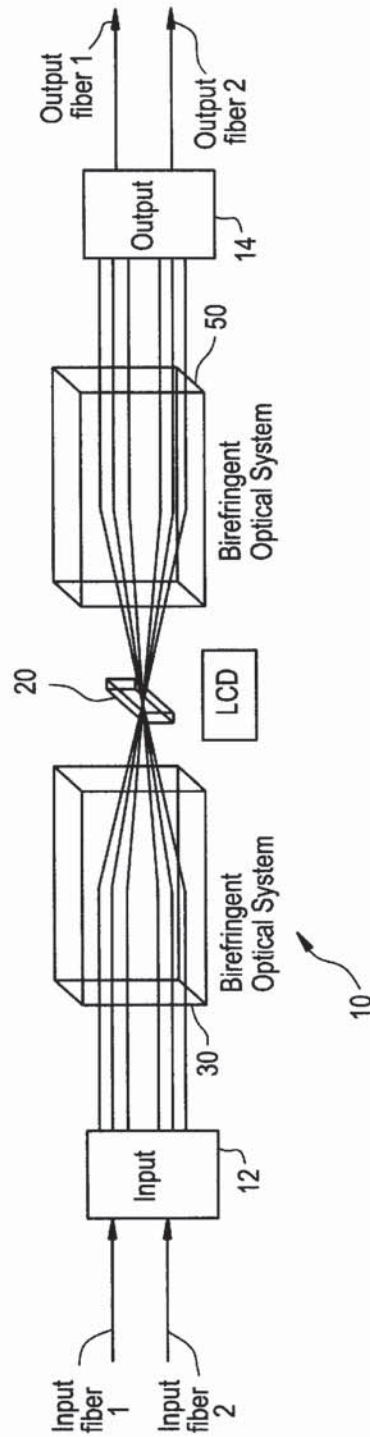


FIG. 2

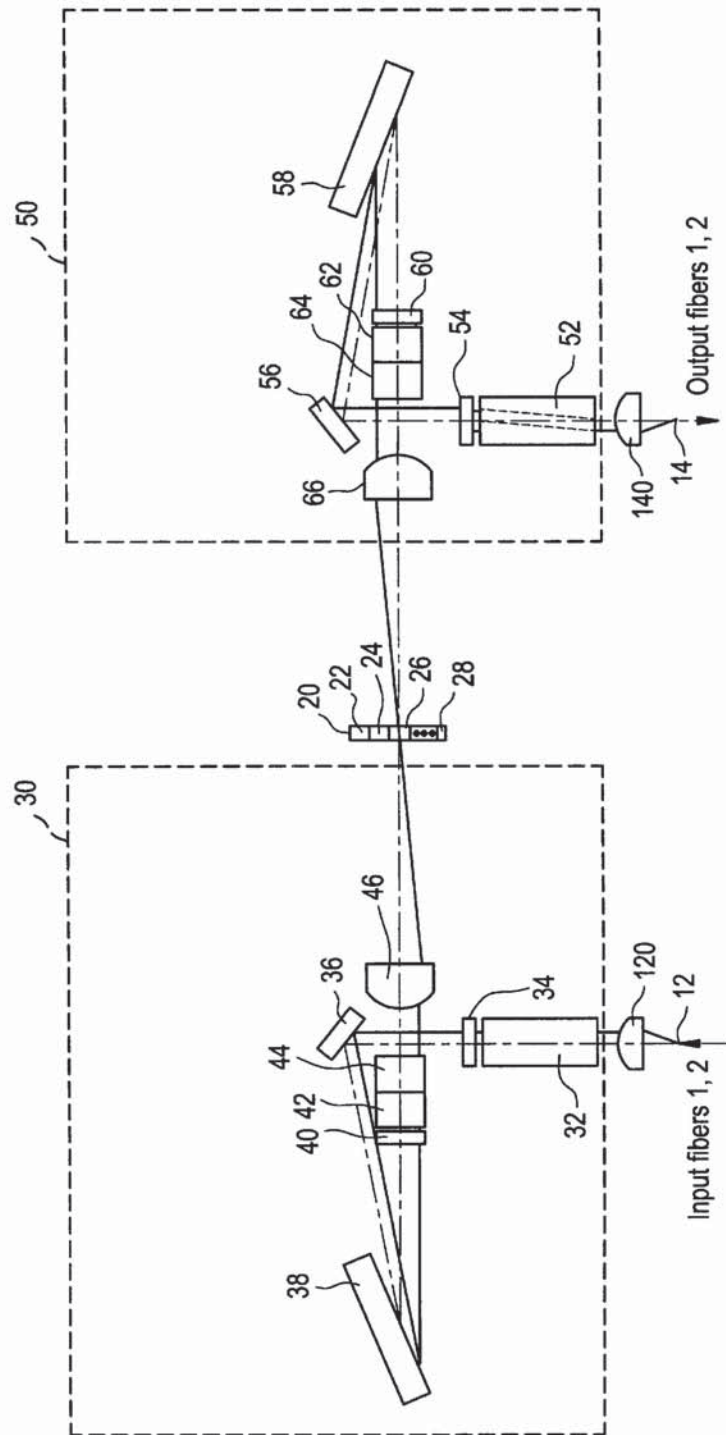


FIG. 3

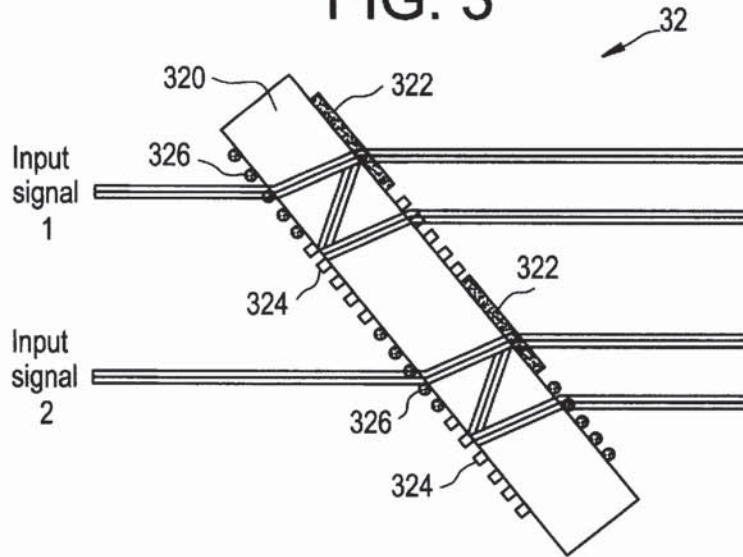


FIG. 4

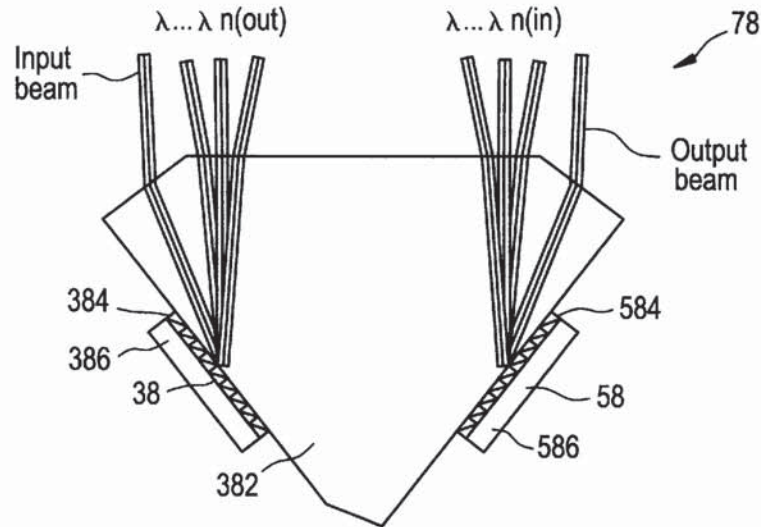
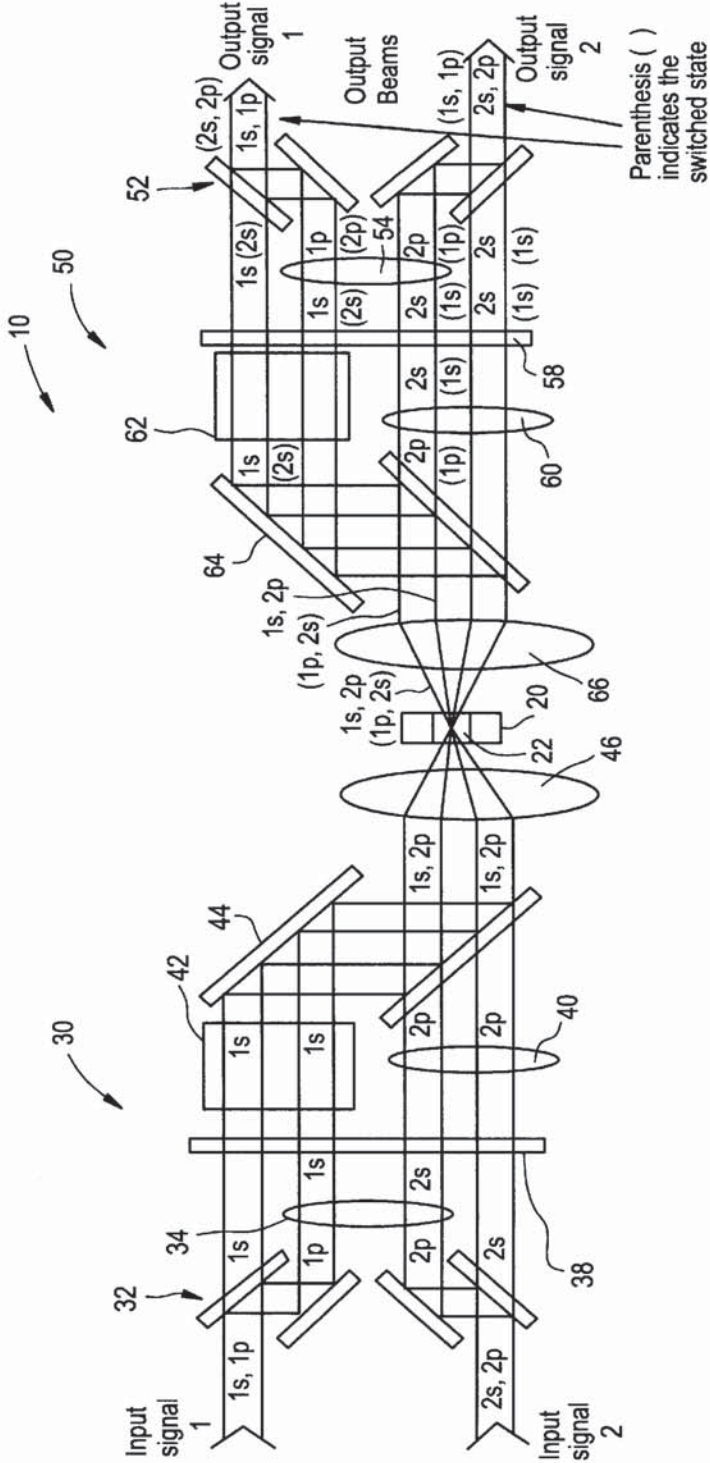


FIG. 5



# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.