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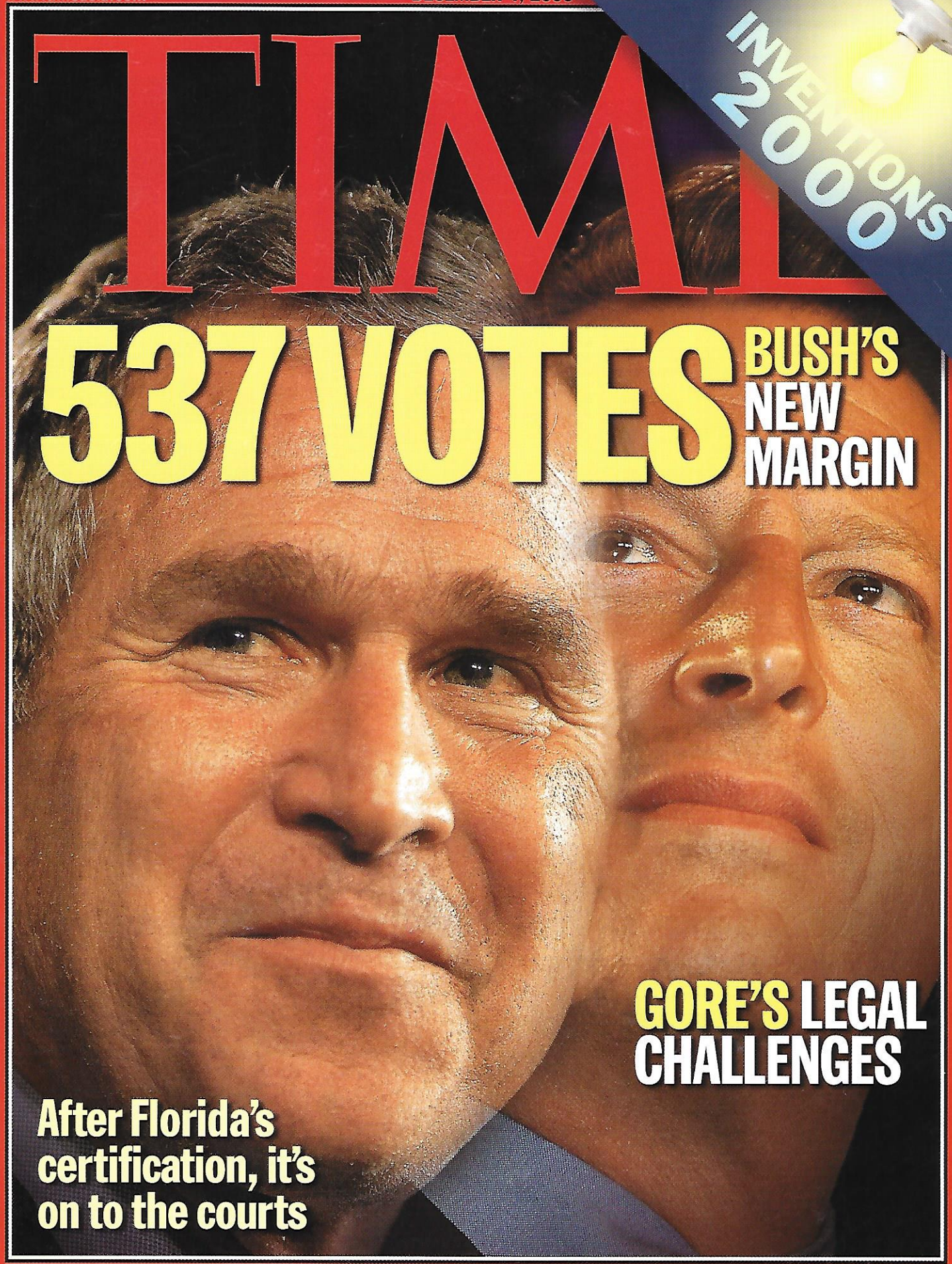
TIME

INVENTIONS 2000



537 VOTES

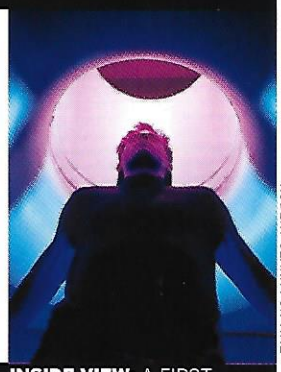
BUSH'S NEW MARGIN

GORE'S LEGAL CHALLENGES

After Florida's certification, it's on to the courts

INVENTIONS OF THE YEAR

WHAT'S NEW



ROBERT CLARK FOR TIME

INSIDE VIEW: A FIRST

THE PROCESS OF INVENTION IS AN ENDLESS CHURN OF ACTIVity that has little respect for the calendar. But in an effort to celebrate what has become a binge of industrial and scientific creativity around the world, the editors of TIME have locked the creative achievements of the year 2000 into freeze-frame and selected three Inventions of the Year. They are from the areas of **CONSUMER TECHNOLOGY, MEDICAL SCIENCE** and **BASIC INDUSTRY.**

We define an invention as something new, created by human ingenuity. It is not a discovery of a natural phenomenon that already exists. It is not merely a product of convergence, technology's latest buzz word used to describe the combining of existing technologies. Yet as our first two choices illustrate, the art of making two or more technologies work together often requires a new invention—even if it is just a complex line of computer code.

The course of invention, from concept to commercial use, almost always runs over many years, so we limited our list of candidates to products that have become available to their ultimate users during the calendar year 2000. Many of these were granted patents several or more years ago. Some fascinating products that are already demonstrably successful nonetheless missed the cut because they won't reach consumers until early 2001. It was of course difficult and somewhat arbitrary to select just three inventions out of dozens of impressive products, devices and ideas we surveyed throughout the year. Many more astonishing innovations are in the pipeline, and others are just a few steps short of making their debut.

Which is all the more reason for us to do this again next year.

—By Barrett Seaman

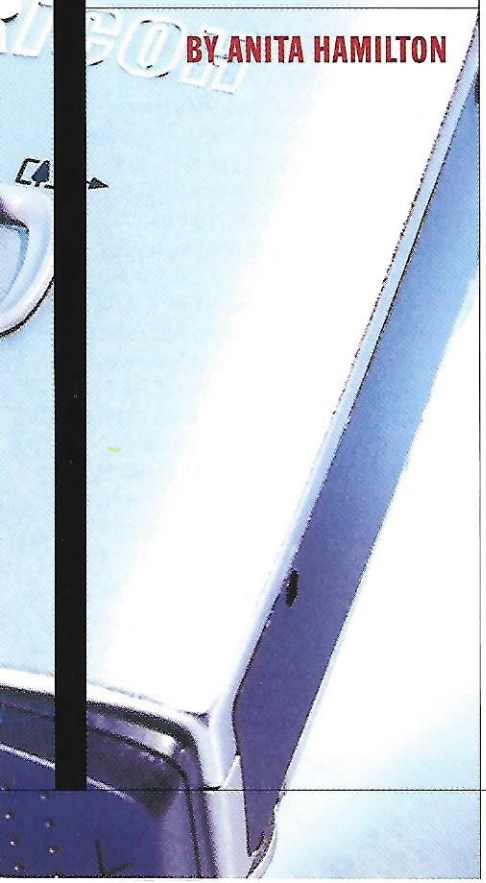
WINDOW ON THE WORLD

No, you're not dreaming. RDC-i700 surfs the Web and lets you scribble notes onscreen with the included stylus

take a picture that can fly

Ricoh's new digital camera delivers much more than pretty pictures. It ushers in a whole new era of wireless imaging by letting you post photos to the Web—then send them as e-mail to your friends

BY ANITA HAMILTON



SOME PEOPLE GET REVELATIONS in the shower. Others solve puzzles in their dreams. Yousuke Yamada, a lead engineer for the Japanese office-equipment and camera maker Ricoh Co. Ltd., gets his best ideas on Tokyo commuter trains. "I cannot create an idea at my desk," he says. "I like to walk around a crowded train, where nobody disturbs me."

Over the past three years, while his fellow commuters jostled for space or scanned the morning paper, Yamada, 55, devoted his four-hour daily commute to a higher cause—dreaming up the next great consumer gadget. In 1997 Ricoh president Masamitsu Sakurai commissioned Yamada to create a device that would help catapult his company, which had built its fortunes on heavy office machines, into the forefront of digital technology. The trouble was, Sakurai didn't really know what he wanted. "The idea was to develop a product that uses all our senses," says Yamada. "There was no paper, no specifications. Just his wish, his hope."

After reviewing the most promising new technologies—and meditating endlessly on the train—Yamada felt he was prepared to design a digital camera like no other. The fruit of his cogitations is about the size of a videocassette and weighs in at just over a pound. But the genius of the RDC-i700 camera is revealed as its top flips up to display a bright, 3.5-in. touch-sensitive screen—a window on the World Wide Web that surfs the Internet, records voice memos, accepts scribbled notes and drawings in 16 different colors and receives and sends e-mail.

In many respects, such features are not new this year. What makes the i700 an invention is its wireless Web-publishing capabilities. Ricoh engineers wrote custom software that resides inside the camera and allows users to correlate images with specific Web pages, then transmit them to a live website of their choice. Not only can you send photos from the road, you can also automatically display them exactly where you want them to appear on your website.

"We created the first camera that allows HTML coding, which can be sent to a Web page and instantly published," says the camera's U.S. marketing manager, Jeff Lengyel. After the photographer takes pictures, which can be shot at a resolution of 3.34 megapixels or less, she selects the snaps she wants to upload to her personal website. Users in Japan—where the product was released in September at about $1,500—can transmit images with a tiny wireless modem that slides into a slot on the camera. Ricoh expects similar wireless cards to be available in time for the i700's U.S. release early next year.

PICTURE PERFECT

IN OUR OWN TESTS, *TIME'S* EDITORS WERE able to upload a low-resolution image to a website in about a minute simply by selecting the desired image onscreen, then hitting a few more buttons to send it through the ether. Skeptical at first about browsing the Web on a screen the size of a drink coaster, we were pleasantly surprised at how easy it was both to enter Web addresses and write e-mail with the slim gray plastic stylus included with the camera.

"The RDC-i700 is an innovative device," notes Christopher Chute, analyst at the high-tech market-research firm International Data Corp. "For the first time, a camera manufacturer has attempted to offer an all-in-one solution for digital-image capture, transmission and display and storage." Such an invention opens up all sorts of possibilities. Cross-country travelers could wirelessly update their home pages on the road with pictures from their trip. Guests at a family reunion or wedding could post images online just minutes after snapping them, so everyone who couldn't attend could see the action as it unfolded. Relocating couples could split their house- or apartment-hunting chores and keep each other up to date on their efforts: find something you like, snap a few pictures and let your spouse log on at the office or at home to see what you've discovered.

Because of the i700's relatively high price (competing digital cameras with the same resolution sell for as little as $800), Ricoh expects its first U.S. customers to be business users, such as real estate agents making Web pages for new listings or news organizations posting photos of fast-breaking stories from the field. In Japan, the government-contracted information service Hokuriku Kensetsu Kosaikai uses the cameras to collect pictures from scenes of natural disasters to help repair workers and rescue teams prepare for the task ahead of them. "We used to use a PC, but not all the workers at a disaster scene are familiar with computers," says the service's manager, Hirokazu Kimura. "[The i700] is very useful for us."

By 2004, over 80 million people will be sending wireless images on the go

INVENTIONS

LEADER OF THE PACK

WHILE RICOH WAS FIRST TO MARKET with a Web-enabled digital camera, the competition is coming on strong. Two California software companies, FlashPoint and ActiveShare, are working to make Web-coding capabilities standard features on the internal operating systems of digital cameras. The companies have begun testing wireless solutions with insurance companies and Web auction houses. By next year, Internet-ready SprintPCS phones will be able to hook up to a Kodak DC290 digital camera and send pictures to a Sprint website. Polaroid is developing a $350 digital camera with a built-in modem for release next spring. The first version will require a regular phone-line connection, but future versions could be wireless.

Research firm InfoTrends in Boston estimates that more than 80 million people worldwide will be transmitting digital images on the go by 2004. While some will do this using cameras like the i700, others will use cell phones with built-in lenses or handheld PCs with camera attachments. Low-cost camera sensors can be added to a cell phone for as little as $30. In Japan, a cell phone released by J-Phone this fall includes a built-in digital camera that lets users snap low-resolution photos of themselves, then e-mail them to friends. In the U.S., people can buy for under $100 add-on camera cards that insert into PocketPC, Palm and Handspring handheld PCs.

Like any other emerging technology, mobile digital imaging has its skeptics. For one thing, picture files are much larger than the data and voice streams that existing wireless networks were designed to handle. "The ability to send that much data over wireless lines is up in the air," notes consumer electronics analyst Jay Srivatsa of Gartner Group Dataquest. Higher-speed networks, such as the 128-kbps Ricochet from Metricom now being tested and the 384K TDMA network due out next summer, could help resolve some of these issues.

Even more promising is the so-called Bluetooth technology (named after a 10th century Viking king), which uses short-range radio waves to enable any two devices to transmit data up to 328 ft. Expected to take off next year, Bluetooth will allow users of any digital camera to send images to their cell phones. The phones can then beam the files to a website. This will eliminate the need for a pricey wireless modem card (currently about $400), making the cameras much more economical.

The i700 has room for other enhancements. "Things need to be simplified," says InfoTrends analyst Michelle Lampmann. "There needs to be an invisible solution where it's just snap and share, like setting a VCR." For example, a standard operating system, like the Palm OS, could make the i700 a real alternative to Net-enabled smart phones or handhelds.

"This is first-generation technology," says Vincent Palmieri, Ricoh's U.S. director of electronic commerce. Currently the i700's address book lets people store up to 50 e-mail addresses, but future versions may include a full-featured address book for phone numbers and addresses, he says. The camera's 8MB of internal storage could be beefed up to make room for more productivity applications and games. The i700's PC Card and CompactFlash slots on the side of the unit leave plenty of room for add-ons and software upgrades.

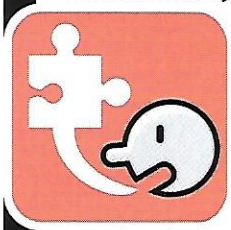
Someday consumers may be able to custom-select the features they want in their personal wireless device. Whether or not the i700 becomes a popular favorite like cell phones and handheld PCs, its release makes clear for the first time that the ability to send and receive images is an integral part of that future. —***With reporting by Tim Larimer/Tokyo***

COMING UP NEXT

ILLUSTRATION FOR TIME BY CHRISTOPH NIEMANN

VOICE RECOGNITION

Talking to a computer is always easier than typing, which is why engineers have been working with such fervor on voice-recognition technology. They've made great progress. The accuracy rates of dictation programs from industry leaders—Lernout & Hauspie, Dragon Systems, Microsoft and IBM—have been improving around 10% a year for a decade now. During the next year, voice software geared to their specialized vocabularies is expected to gain a foothold in the medical and legal professions. Popular search sites like AskJeeves and TellMe Network hope to become "voice portals," letting users seek information by speaking simple phrases into the phone.



That's just the start. The next few years will begin the era of "pervasive computing," when the focus of digital software will migrate from desktop PCs linked to the Internet by phone wire to a plethora of newfangled, Web-ready products ranging from TVs and cell phones to dashboards and Palm Pilots. "You'll have the Internet in your pocket, anytime, anywhere," says Kai-Fu Lee, Microsoft's v.p. of user-interface platforms, of tomorrow's wireless and handheld devices. Most of them will be too small to have a keyboard. "The only way you're ever going to get lots of data into small devices," says Dragon Systems founder Janet Baker, "is by talking to them."

Eventually they'll even understand you. The 10-year horizon promises the birth of both natural-language software that "understands" many complex sentences, and broadband data speeds that make online video ubiquitous. The average software product in 2010 could well have a face, a voice, ears and something resembling a brain, which suggests that our next great challenge will be figuring out what we really want to say. —*By Michael Krantz*