Image Input Using an Oversize High-Precision Vertical Scanner, and a Variety of Output Applications for the Resulting Data

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Abstract

What could be done with a gigantic scanner? Could three-dimensional objects be scanned without being placed on a scanning bed? Wouldn't it be fun to output the resulting data? Ideas like these led to the development of an oversize high-precision vertical scanner with a total scanning area 900 mm wide by 1980 mm tall, and 430 million image capture pixels. This scanner has already been used to digitize objects for use in carpet samples, as well as to scan in Buddhist statues (to enable the carving of accurate reproductions). Human beings have been scanned in by it and turned into life-size posters. Designers have used it to scan clothing and accessories, and create posters for stores. Artists have used the scanner to create digital works of art and exhibit them on the spot. When this oversize high-precision scanner, which has remarkable focal depth, is paired with a large-format printer, everything from large city maps and wiring diagrams to folding screens, hanging scrolls, Buddhist statues, and even human beings can be scanned at actual size and copied. This scanner easily performs tasks that are difficult to achieve with digital cameras, and signals the birth of a new kind of large-format on-demand printing.

Oversize High-Precision Particle Scanning and Output

Screen's oversize high-precision vertical scanner/copier includes a large-format scanner designed for scanning large objects, a desktop computer, and a large-format inkjet printer. Unlike a typical large-format copier, this scanner/copier is designed especially for the scanning of three-dimensional objects.

Most scanners, including those in typical large-format copiers, are used to scan paper. In flatbed scanners of this type, the glass surface of the scanner is illuminated from below while multiple CCD light receptor sections, which are designed to cover the widest area possible, are focused on the glass surface. To successfully scan three-dimensional objects, however, requires limiting CCD receptors to a single scanning section. What's more, since three-dimensional objects have depth, standard scanner illumination is not sufficient to light the entire object. Using auxiliary illumination to light the object being scanned is the best way to assure good results.
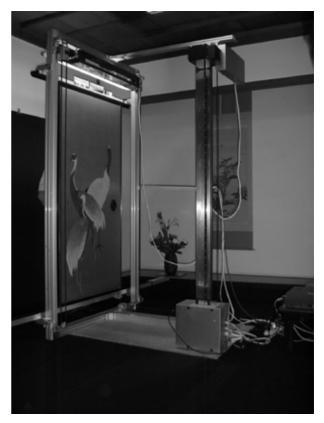

Figure 1. Oversize high-precision vertical scanner/copier.

Another important difference is that a scanner, unlike a camera, digitizes objects line by line. This means that while scanning a person, for example, the feet are not visible as the head is being scanned. Capturing photos like those taken by cameras would require the subject to be completely still during the entire scanning process – even if the subject being scanned is a person. This leads to problems similar to those involved in taking photographs with old-fashioned cameras, whose long exposures required the subject to stand completely still for a fairly long time. On the other hand, this scanning pattern also means that a section of the object being scanned can be rescanned after the first scanning pass, if desired. Human subjects can also intentionally choose to move as scanning is taking place, to create unusual effects. This has enabled

designers and event planners to create new kinds of visuals that can't be created using traditional or digital cameras.

Applications of the High-Precision Vertical Scanner

Screen's high-precision vertical scanner is suitable for a variety of applications, such as capturing whole-body images of people, scanning large and delicate objects, and creating posters for in-store display.

Human Subjects

Scanning people has become a popular use for the oversize high-precision vertical scanner/copier. People interested in being scanned simply fill out a form providing information on themselves and the desired output format (text to be included, and so on). After they are scanned, and before the scan is output, they can check the scan results. Once they have OK'd the scan results, the scan is output. The subject can then either take the output home or have it shipped to them. Vertical scanning of a person takes about 45 seconds; horizontal scanning takes about twice as long.

Figure 2. Human subjects

In-Store Posters

Another use of the oversize high-precision vertical scanner/copier is the scanning of products in stores, for use in the rapid production of in-store posters. Since the oversize high-precision vertical scanner/copier provides

much higher resolution than a digital camera, it reproduces even fine details, such as the texture of clothing. It also ensures more consistent lighting than is usually possible with cameras. These factors help speed and improve the image capture process.

As a result of these advantages, the high-precision vertical scanner is now being used in the clothing industry to capture images of clothing and accessories that are then used to create in-store posters.

Digital Archiving

The oversize high-precision vertical scanner/copier can also be used to digitally archive large, delicate objects, such as statues and scrolls. This has proved extremely useful in preserving an accurate record of some of Japan's most important cultural treasures. These include many large objects that are actually incorporated into buildings, such as paper sliding doors, as well as furniture, such as folding screens. The oversize high-precision vertical scanner/copier is perfect for digitizing objects like these. Its high-quality, precise scanning accurately captures difficult to digitize features, such as gold leaf, and the superior output of the copier portion recreates these objects at a quality that rivals that of on-demand printing.

Conclusion

Screen's oversize high-precision vertical scanner/copier is a versatile tool that offers fast, high-quality scanning and output of three-dimensional objects. It provides more precise imaging than a digital camera, and its output is faster and less expensive than using high-quality conventional camera data for on-demand printing. Whether the goal is a fun event that allows people to get a personalized poster of themselves, the production of POP advertising, or the preservation of cultural treasures, Screen's high-precision vertical scanner/copier is the ideal tool for fast, accurate, large-format image capture and output.

Biography

Masahiko Sakurazawa graduated from Chiba University's Department of Image Science Technology in 1982. He has spent much of his employment at Dainippon Screen publicizing new products such as front-end systems, DTP input/output devices, and Computer To Plate (CTP) equipment as part of the Sales Promotion Section. He is currently working on promoting the sale of digital printing devices, in his role as the General Manager of the Digital Printing Department.