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U.S. Patent & Trademark Office Registration Number 38449



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**BioBanking Biometric Insert**

Inventor: Chad Watson, 5800 Industrial Blvd, Omaha, NE, 68135

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Int. Cl. ………………. C38J 44/14

U.S. Cl. ……………… 83/169.5;83/170.1

Field of Search ………. 83/167, 168, 169.1, 169.2,

83/170.1, 83/169.5

**References Cited**

US Patent Documents

4,185,318 1/1997 Xiu . .………… 83/171

6,143,270 12/2002 Long ………… 83/171

7,083,614 7/2005 Koeppel ………. 83/167

Foreign Patent Documents

None Noted

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**Abstract**

The BioBanking Insert is a radio frequency device that is installed in the finger of a human to enable financial transactions in a more secure manner. The device is encoded with account identification information and the fingerprint of the individual is used as the authentications mechanism. All processing and power are included in the device.

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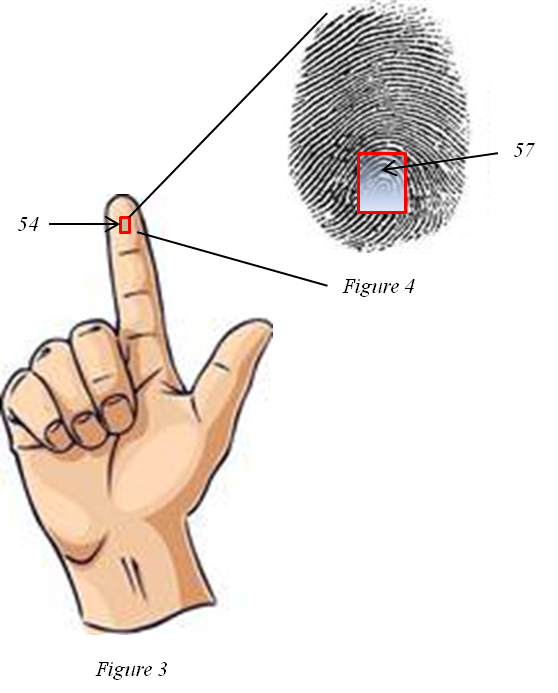


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**BioBanking Insert**

Background of the Invention

The present invention relates generally to biometric readers designed for security purposes. These readers have always been passive and interrogated the biometric feature of the individual to be authenticated.

This inventions specifically relates to biometric security scanners that use fingerprints as an authentication mechanism. These are now common throughout security systems worldwide. Some examples of fingerprint scanners are seen in the following US patents:

Xiu, US Patent No. 4,185,318 illustrates a fingerprint scanner based on basic 14-point outline and contour mapping. The device had an analog output that could be mis-interpreted by the security system it interfaces with.

Long, US Patent No. 6,143,270 further evolved the passive fingerprint scanner with a digital interface that could allow longer range transmission of the fingerprint data. However, no further refinement was made in the passive interrogation techniques for the fingerprints.

Koeppel, US Patent No. 7,083,614 refined identification techniques for financial transaction security with biometric identifiers in debit and credit cards. These mechanisms allowed bank cards to be manufactured with specific biometric markers for each end user. However, these markers did not preclude identity theft as it was a one-time encoding.

Summary of Current Invention

The object of the present inventions is to advance financial transaction security by requiring both active biometric interrogation with RF account information simultaneously. Without both elements the transaction will fail.

The device is a small implanted device in the finger of the user coupled with a modified fingerprint reader. The third element in the system is an RF encoder to imprint or modify account information once the device has been implanted.

Another technological evolution is the fact that the BioBanking insert device requires precise biological monitoring that will preclude it from working should the device become detached from the host.

The BioBanking system represents a significant step forward in reducing or eliminating identity theft and financial fraud.

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Brief Description of the Drawing

The invention will be more clearly understood and the technological advances more clearly understood with a detailed description using the accompanying drawings.

**Fig. 1** is an overall drawing of the biometric insert device with the salient features pointed out.

**Fig. 2** is a detailed drawing depicting the RF arrays and controls for the active RF send and receive.

**Fig. 3** shows the general placement and relative size of the implanted device.

**Fig. 4** clearly shows the exact placement within the fingerprint structure for best resolution of the authentication mechanisms.

Description of the Preferred Embodiments

Referring to the drawings and especially to FIGS 1 and 2 we see the features that enable operation of the BioBanking device.

The desire is to have onboard power that is not dangerous to the wearer of the device. Additionally, the power system had to meet the requirements of fitting into a very small space. References 22 and 34 in Fig. 1 show the location of the solar energy collection grid and the solar energy storage module. Since the device is sub-cutaneous there is enough light penetration to power the device. The technology is similar in nature to the watch Eco-Drive solar technology.

Fig. 1 reference 35 shows the location of the main power conversion and distribution system. The power distribution system converts the solar energy into 12 volt direct current (DC) power for efficiency and distributes it to the ambient temperature sensors and the RF array.

Fig. 1 references 38 and 41 and Fig. 2 show the placement and details of the heart of the device which are the RF transmit and receive arrays. Fig. 2 references 14, 18, and 21 show the power and control systems for the RF array. The Frequency Modulator [14] and RF Control Processor [21] handle the operation of the RF array to achieve 110 degrees of coverage for receive and 180 degrees of coverage on transmit. This range of coverage is required when the device is presented in off-angle situations to ensure high probability of transaction success.

Fig. 2 references 16 and 20 are the transmit and receive arrays respectively. The RF arrays use wafer technology to allow the

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most transmit surface area in the least amount of space.

The final technical feature of the device is depicted in Fig. 1 at reference 42. This is the ambient temperature sensors that make the device unique in the fingerprint authentication market. With other fingerprint biometric devices the severed finger might be used to gain unauthorized access to the security system. The ambient temperature sensors ensure that the device is in a very precise temperature band environment centered on the 98.6 degree nominal human body temperature.

Now we turn the attention to placement of the device in the user. Fig. 3 and Fig. 4 define overall size and placement of the insert for maximum effectiveness. The device size is small enough to be implemented without a surgical procedure by a person trained in the procedure. The device size requirements were to not exceed 50 millimeters in length and width. The optimal placement is in the right index finger as it has the most range of motion of any of the digits. Fig. 4 shows an enlarged image of the device just below the main central swirls of the finger print. This is the most optimal placement due to this area being central to most 14 point interrogation systems for fingerprint analysis. This keeps the device in line with current fingerprint identification technology.

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