RECONNAISSANCE
AUTHENTICATION & BRAND NEWS™

VOLUME 28 – NO 2 / FEBRUARY 2022

Securikett IoT Platform and Labels at Heart of New Packaging Recycling Project

The Austrian pilot project 'Digi-Cycle' – supported by the Austrian drinks industry to facilitate householding recycling of beverage containers through a rewards scheme – took place last August and September. Central to the pilot, which is part of a series of initiatives for waste management and recycling that will be signed into law, were tamper-evident labels and a system for generating limitless UIDs by Austrian security solutions provider Securikett.

Digi-Cycle is a digital incentive system for the separate collection of beverage packaging, with rewards offered to increase waste separation and recycling by householders. It was run by resource management pioneers Saubermacher and Altstoff and took place in the district of Gnas in southeastern Styria. The objective of the pilot, in which every sixth household participated, was to provide insights into the concept of a voluntary collecting bonus for end consumers willing to recycle.

At the heart of the scheme was an app, with which the code on the bottle or beverage can, and the respective collection container, is scanned. Securikett's contribution included the creation of the codes through its proprietary IoT platform Codikett and the production of tamper-proof labels with a newly developed recyclable adhesive.

Codikett is modular system for product identification and has been proven in the global market for many years. It generates a near limitless number of secure unique identifiers in a matter of seconds. Querying the coding system, which is based on cryptographic processes, delivers results just as fast.

It enables independent participants in the manufacturing chain to download and deploy large volumes of security codes quickly and traceably, the idea coming from the requirements of the European regulation on tobacco product traceability.

Digi-Cycle (© Securikett).

'Imagine having to search a large database for every code on a beverage bottle in order to activate the collecting bonus via the internet. That would take far too long with millions of packages in circulation that need to be recycled,' said Dr Marietta Ulrich-Horn, CEO of Securikett, highlighting the scope of the IoT solution.

For the physical side of the scheme, Securikett developed tamper-evident QR code labels for application to a variety of different packaging materials – glass, aluminium and PET beverage containers – using a novel adhesive. By using a special security effect in the label, any detachment of the label is immediately visible, says Securikett. At the same time, the adhesive is water-soluble, allowing the recycling process to proceed undisturbed.

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TruTrace and Laava Partner for Blockchain-Supported Traceability

TruTrace Technologies, a Canadian developer of a fully-integrated blockchain platform, has entered into a strategic partnership with Australian technology company Laava to drive product provenance and traceability.

TruTrace Technologies' platform TruTrace™ is a cloud-based blockchain software that connects quality control and inventory management, enabling companies in the legal cannabis, food, pharmaceutical and agriscience sectors to track products at every testing point throughout their lifecycle, from manufacture to sale. It has two offerings: TruTrace SaaS for 'traditional' industries, and StrainSecure™ SaaS for the cannabis industry.

Laava, meanwhile, describes itself as 'bringing secure, scannable, product authentication technology to the market'. Together with Australia's leading scientific research institution CSIRO, it is the developer of the patented Laava Smart Fingerprint®, which uses patented optical technology to create randomly-generated codes that are captured and stored on a secure server (the company taking its name from the organic and unpredictable nature of a lava flow, which is mirrored in its technology).

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Why Brand Protection is Important

Last month's relaunch of Authentication & Brand News™ comes, in the words of my co-editor Nicola Sudan, 'at a time when it is more important than ever for brand owners to safeguard their intellectual property' (see ABN January 2022). This is undoubtedly true, with the effects of COVID-19 bringing tighter household budgets, disrupted supply and distribution chains and the accelerated shift to online retail, making it easier than ever for counterfeiters and fraudsters to abuse intellectual and other corporate property.

So, it may be a good time for those of us who operate in the authentication and brand protection sectors to stop and ask ourselves two simple questions:

- Why is intellectual property (IP) important, and
- What is the future for IP protection?

The financial accounting answer to question one is that IP is an important intangible asset that sits on a company's balance sheet whose value is difficult to quantify until the IP is either bought, sold or exploited. PricewaterhouseCoopers (PwC) conducted research in 2014 reflecting, on average, that 75% of a company's total asset value is comprised of intangible assets.

The working definition of IP used by the World Intellectual Property Organisation (WIPO) is 'a protection in law… which enables people to earn recognition or financial benefit from what they invent or create. By striking the right balance between the interests of innovators and the wider public interest, the IP system aims to foster an environment in which creativity and innovation can flourish.'

Patents were first systematically granted in Venice in the mid-1400's, when inventions were communicated to the state and in return the inventor was offered legal protection against potential infringers.

In the early stages of the development of IP law, the balance between 'the interests of innovators and the wider public interest' was probably in favour of the innovator, leading to monopolistic practices and in turn to price gouging. But as economic factors pointed to the benefits of fair competition there was general agreement across jurisdictions that there should be a time limit to the protection provided by a patent, culminating in the 1990's by the implementation of the World Trade Organisation's (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs Agreement)[1], Article 33, that provides a term of 20 years protection from the date of filing.

There is the idea that patent protection provides, for a fixed period of time, an individual or company a chance of getting a fair return on their investment in research and development (R&D), so that it encourages them to reinvest in innovation but without stifling competition. This notion is not universally held, although there are signs that this is changing.

Since the end of World War II, many countries in Asia, including China, Japan and South Korea, have developed their industrial bases to become thriving economies that operate globally in all industrial sectors. Amongst these countries, China has been identified, at least from a Western perspective, as having little regard for respect of IP.

As China has grown to become the largest industrialised nation[2] for many goods, including textiles and apparel, fertiliser, footwear, toys, electronics, food processing and automobile parts – the very goods that are the targets for counterfeits – China has shifted from following to participating in the realms of R&D and innovation. The nation was ranked 4th in the world for US granted patents in 2020[3]. Add to this, the resources that are being put into university research funding resulting in three top-30 research intensive world rankings (Tsinghua University, Peking University and Fudan University), and you have a government that is putting sizeable state resources into creating their own sovereign IP portfolio.

What this means for the future of IP protection worldwide is difficult to say, but one indicator will be the extent to which a more IP-aware China regime will take measures to enforce domestic compliance with foreign owned IP.

As China presses ahead with its plans on R&D and innovation, it increasingly becomes in the country's own interests to keep improving its IP legal framework and enforcement. It is already taking steps in that direction with the New Patent Law[4], which came into effect on 1 June 2021, that will make an impact on all areas of patent prosecution, enforcement, and exploration. Add to this the EU-China landmark agreement[5] on protecting European Geographical Indications, which came into force on 1 March 2021, and IPKey China[6] – an EU Project designed to enhance EU-China cooperation on selected emerging challenges – and you have a measure of the Chinese commitment to increase transparency and improve IP enforcement.

Does this mean that the traditional major supply routes of counterfeit goods converging back to China will be disrupted anytime soon? I suspect not. China is a massive country with loose legal reach outside the major conurbations. What I do think is that as China recognises the benefits of IP protections of its own home-grown IP, then a more robust attitude to domestic enforcement will follow.

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1 https://www.wto.org/english/tratop_e/trips_e/trips_e.htm
2 https://www.cia.gov/the-world-factbook/countries/china/#economy
3 https://www.ificlaims.com/rankings-trends-2020.htm
4 https://gowlingwlg.com/en/insights-resources/articles/2020/ten-highlights-of-china-s-new-patent-law/
5 https://ec.europa.eu/commission/presscorner/detail/en/IP_20_1602
6 https://ipkey.eu/en/china

2D Barcodes Herald New Authentication and Brand Awareness Possibilities

The UPC (Universal Product Code) linear barcode has offered price lookup functionality for decades. However, the classic barcode is no longer keeping up with today's growing demands for greater product information transparency, traceability, and authentication.

The industry is therefore moving toward two-dimensional (2D) barcodes that are able to carry more information. 2D barcodes allow for a single, standardised way to meet both supply chain needs and evolving consumer requirements.

The information carried by 2D barcodes can also help enable:

- Improved inventory management
- Enhanced recall readiness
- Greater sustainability and ethical sourcing
- Better product authentication
- Greater brand trust.

The industry has set a date to make the transition to accepting 2D barcodes at point-of-sale – referred to as 'Sunrise 2027'.

To help prepare for the transition away from linear codes, retailers are experimenting with a new 2D barcode standard capable of sharing much more information than the traditional zebra-shaded stripes seen on most consumer products, according to the not-for-profit information standards organisation GS1 US.

The standard could also be used in warehouse and logistics settings, but GS1 is currently focused on the 'point of sale' scanners used at retail stores and cash registers, according to Carrie Wilke, the group's Senior Vice President, Standards & Technology.

In support of the switch over, GS1 has published a 'Barcode Capabilities Test Kit' to help retailers evaluate their readiness to transition from linear UPC to data-rich 2D barcodes. Companies can use the kit to measure their ability to process the new codes both with their front-end scanning hardware — such as those found in self-checkout aisles at grocery stores — and also the back-end software systems that process the data.

According to Wilke, the 2027 target date is an optional timeline set by the retail industry in collaboration with GS1 US to equip consumers with more information about the products they buy. Retailers will not be required to change over to the new standard at any specific time. Rather, the project is a phased migration plan for implementing 2D barcodes, which will guide brands through labelling transition considerations while further ensuring reliability of 2D barcode scanning.

Retailers that do choose to implement the new barcodes will be able to communicate far more data to consumers than a basic price tag, adding information on product sustainability, traceability, ingredients, packaging, and specific batch and lot numbers, expiration dates, and on-demand discounting, Wilke stated. In addition, the new standard is easier for scanners to read than current UPC codes, which can be obstructed in conditions like steep angles, bad lighting, or wrinkled labels.

'Global retailers, brands and solution providers have been moving toward the use of 2D barcodes to provide consumers with detailed product information and transparency,' Wilke said in a release.

'However, there are many other supply chain benefits, including improved inventory management, recall readiness, sustainability, ethical sourcing, product authentication and brand trust. A single 2D barcode conveys limitless information in a machine-readable format, and while the transition is a multi-step process, GS1 US will be collaborating with industry to align on capabilities for success.'

As a neutral global standards body, GS1 is coordinating the transition effort to ensure that recommendations and guidance include the needs of all stakeholders to produce a fully interoperable, global solution. GS1 US will continue to work with the retail industry globally to create requirements, conduct testing, analyse results and provide recommendations to optimise 2D barcode placement, read priority and scanning performance in both the dual (UPC + 2D) and single (2D) marking scenarios. This includes testing with the University of Memphis AIDC Lab. Insights will also be incorporated into guidance developed for the industry globally.

'While the transition to 2D barcodes is still in its infancy, we understand that benefits around sustainability, traceability, supply chain visibility and meeting the needs of consumers are creating a great deal of interest across industry,' said Marcia Mendez, Senior Program Manager, Walmart.

'Ultimately, suppliers will likely drive this evolution as they increasingly label their products with 2D barcodes; however, retailers will need to ensure that not only can they scan 2D barcodes, but also read and ingest the data, which we've learned are two very different capabilities during the pilot project'.

Securikett IoT

(continued)

Digi-Cycle is being supported by leading organisations in the Austrian drinks industry, including Brau Union Österreich, Rauch, Red Bull, Vöslauer and Coca-Cola Österreich. It forms part of a raft of measures under the Austria Waste Management Act and Packaging Ordinance, aspects of which include:

- Deposits on disposal beverage containers as of 1 January 2025.
- Obligations for electronic marketplaces and fulfilment service providers as of 1 January 2023. Sellers must comply with legal requirements concerning the collection and recycling of packaging material, disposable plastic products, waste electrical equipment and device batteries. This means that marketplaces and fulfilment service providers will need to exclude sellers from the platform in the event of non-compliance.
- Plastic packaging is to be reusable or recyclable as of 2030.
- In household collection, all plastic packaging is to be collected separately throughout Austria, and a new model for the collection of commercial packaging is to regulate the assumption of transport costs within the scope of producer responsibility.
- Producer responsibility is extended to raising the level of awareness of and eliminating littering from certain single-use plastic products (this is usually done by the take-back system).
- Digi-Cycle for single-use deposit and separate collection.

Whilst the Digi-Cycle pilot was applied only to drinks containers, a major benefit is that the technology can be extended to include numerous products, including non-food packaging, batteries and electrical appliances.

News in Brief

OVS Offers 'Game Changer' for Celebrity Fashion Collections

Nitches Inc, a designer and manufacturer of high-end clothing and accessories, has announced the launch of its patent-pending Owner Verification System (OVS) to prove the authenticity of its exclusive capsule collections created with celebrities and influencers. Nitches also plans to make OVS available to other businesses that want to protect their merchandise from counterfeiting in the near future.

Nitches sews a unique QR code into every item it manufactures. Buyers can scan these codes to register their products with a phone number and/or email address on Nitches' proprietary mobile app to verify ownership and originality. The app works on both iOS and Android devices.

After the QR code is scanned, the OVS stores the information on a blockchain to ensure the transaction is completely safe and secure. Blockchain will also allow Nitches to protect its NFTs (non-fungible tokens) of its clothing items in the digital world, leading to increased interactivity and more secure ownership.

'Because we are working with celebrities and our collections only include 200-300 select clothing items, it was paramount that we safeguard our intellectual property and luxury brand,' said John Morgan, Nitches' CEO. 'We believe our verification technology will be a game-changer for other companies worried about counterfeit products in industries from fashion to sports equipment to home furnishing.'

Amcor Invests in PragmatIC for Sustainable Packaging

Multinational packaging firm Amcor has made a strategic investment in low-cost electronics company PragmatIC Semiconductor. The $5 million investment is part of Amcor's ongoing efforts to identify and develop advanced sustainable technologies for the packaging industry.

UK-based PragmatIC focuses on developing ultra-low-cost electronics based on flexible and integrated circuit solutions. Its ConnectIC family of radio frequency identification and near-field communications (RFID/NFC) integrated chips has the potential to store and transmit information to various devices, including smartphones, when added to product packaging.

The technology can be used to deliver smart packaging applications across the product lifecycle, from manufacturing and supply chain management to consumer engagement and even material recovery.

The investment from Amcor forms part of PragmatIC Semiconductor's Series C funding round, in which the company raised more than $90 million.

HP Indigo Secure and Jura Install First Digital Secure Press

HP Inc has installed its newly imported HP Indigo 6K Secure Digital Press in Nepal, for the local production of tax stamps, ID cards and other secure documents. This marks the first installation of the press for a government authority.

The press, which was launched in 2021, combines a set of digital features originated by Jura, which can create multiple security layers and variable elements in one pass. This includes the application of unique identifiers in multiple locations on a label, package, or tax stamp, for a full authentication and track and trace solution.

The press is built upon HP Indigo's proprietary liquid electrophotography (LEP) digital colour printing technology and uses the largest set of inks available to the security digital printing industry (including HP Indigo's spot colour, silver, digital-colour-shifting, invisible UV, MICR and tagged inks).

With this technology, Nepal will generate an estimated savings of NPR 9 billion ($75 million) a year, said Bikal Paudel, Executive Director of Nepal's new Security Printing Centre.

Next Generation Barcoded Postage Stamps

Lake Image Systems, a leader in print quality and variable data verification and camera inspection solutions for the security, labels, and commercial print industries, has implemented its in-line camera inspection system at the Dutch security printer, Royal Joh Enschedé, to validate variable data matrix codes printed on the new, trackable postage stamp for Deutsche Post.

By printing a unique, two-dimensional data matrix code on every stamp, Deutsche Post can now easily detect reused or forged stamps to prevent fraud, track a letter throughout its network, and provide customers new digital and philatelist services with the barcoded stamp.

In early 2021, Royal Joh Enschedé was one of the few select security printers to print these revolutionary new stamps and selected Lake Image Systems and its parent company, Domino Printing Sciences, to print and inspect the variable matrix code on every stamp during the production process.

Domino implemented its K600i inkjet printing system to print variable matrix codes on sheets containing 90 stamps, whilst Lake Image implemented its DISCOVERY Multiscan3 camera inspection system to read, verify and grade every code according to the required specifications. Both systems were mounted inline onto a Mabeg sheet feeder, running at 2,000 sheets per hour. If a variable matrix code on a stamp failed the inspection, the entire sheet is automatically diverted and discarded.

At the end of every run, DISCOVERY Multiscan3 produced a detailed report on the status of every stamp, allowing Royal Joh Enschedé to check for possible duplicates and to generate a manifest file which would be sent to Deutsche Post. This file enabled Deutsche Post to release the stamps knowing precisely which codes were active and, more importantly, which were not.

A more detailed case study on the project can be found here **www.lakeimage.com/casestudies/royal-joh-enschede/**.

IBM Files US Patent for AI-Based Dilution Detection

Tech giant IBM has filed for a US patent (Application No 20210326900) on a method for detecting when a medicine has been diluted, a well-established method for carrying out pharmaceutical fraud.

The method relies on the use of artificial intelligence and machine learning to analyse various physical, spectral, optical and/or chemical characteristics of a sample.

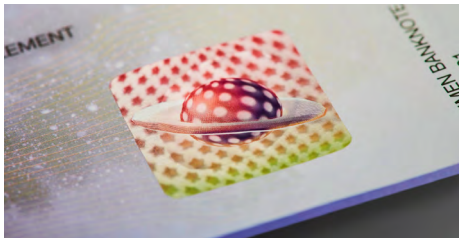
It could be used to detect counterfeits as well as incorrectly prescribed doses at the point of administering a drug, according to the patent, which describes various detection devices that could be developed from the concept.

There have been multiple incidents in which counterfeiters have taken a genuine medicinal product, watered it down and produced many times more vials or bottles of a drug, some in the original containers and some in fake or re-used packaging.

The presence of the active ingredient and legitimate packaging can make this sort of falsification hard to detect, generally requiring forensic examination of the contents.

KURZ Moves on With KINEGRAM DYNAMIC®

Foil and thin film technology company KURZ has been a pioneer in the use of diffractive optical anti-counterfeit features on banknotes since its earliest developments. Now, KURZ has made another step forward, with OVD Kinegram (OVDK), a member of the KURZ Group since 1999, in introducing its latest optical technology, KINEGRAM DYNAMIC®.



KINEGRAM DYNAMIC planet patch (© KURZ 2022).

KINEGRAM DYNAMIC balloon stripe (© KURZ 2022).

The introduction of KINEGRAM DYNAMIC technology is the next building block in KURZ's modular banknote protection strategy as it introduces micro-lens based features into the anticounterfeit module. Unlike some micro-fabrication techniques that rely on a regular array, KINEGRAM DYNAMIC has a structure where the lenses are arranged in a freeform array and the shape and size of the lens surface can be individually adapted to the customer's requirements. The resulting properties of the array allow design control over the multiple colours, movement, depth, magnification, inversion and light & shade of image elements.

To help launch KINEGRAM DYNAMIC, KURZ ran a webinar on 16 February for a vetted audience of central bank officials and industry partners, during which Dr Harald Walter (Head of Micro & Nano Engineering at OVDK) confirmed that the novel technology is a micro-lens based optical feature that provides multi-coloured deep 3D dynamic movement effects, allowing limitless design integration. It can be applied in the normal patch or registered stripe form factors that you would expect on banknotes. Threads are likely to follow in a second phase of development.

As is often the case in webinars, the Q&A session threw up some of the most interesting exchanges between Dr Harald Walter, Peter Mühlfelder (Head of Business Area Security, KURZ) and the invited online audience. On this occasion, KURZ disclosed that they are open to starting projects with industry partners to trial the new device in additional form factors (including windows) and on different substrates.

One question that remains (intentionally) unanswered after the session is what is the technology that allows for such precise control over the dimensions of the lens array? Perhaps we'll find out more when KURZ present their paper on KINEGRAM DYNAMIC at HSP Latin America (14-16 March 2022, Mexico City **hsp-latinamerica.com**).

If you like to gain further technical insights into KINEGRAM DYNAMIC®, watch the KURZ expert interview at KINEGRAM DYNAMIC® | KURZ Banknotes (**kurz-banknotes.com**).

Silkworms Spin New User Authentication

A group of academics at South Korea's Gwangju Institute of Science and Technology (GIST) have utilised natural silk fibres from domesticated silkworms to build an environmentally friendly digital security system that they say is 'practically unbreachable'.

The naturally occurring physical unclonable function (PUF) takes advantage of the diffraction of light through natural micro-holes in natural silk to create a secure and unique digital key for future security solutions.

Physical unclonable functions are devices that leverage inherent randomness and microscopic differences in electronics introduced during manufacturing to generate a unique identifier (eg. cryptographic keys) for a given set of inputs and conditions.

PUFs are not created by algorithms but are one-way functions derived from uncopiable elements to create unbreakable identifiers for strong authentication. Over the years, PUFs have been widely used in smartcards to provide 'silicon fingerprints' as a means of uniquely identifying cardholders based on a challenge-response authentication scheme.

The newly proposed method from GIST uses native silk fibres produced by silkworms to create PUF-based tags that are then used to devise a PUF module. This mechanism works on the underlying principle that a light wave experiences diffraction when it hits an obstacle, in this case, the silk fibre, or passes through an aperture – the naturally occurring micro-holes in silk.

'The nanofibrillar structures in each microfibre significantly improves the light intensity contrast between the background and focal spots owing to the strong scattering,' the researchers noted in 'Revisiting silk: a lens-free optical physical unclonable function' published in Nature Communications[1]. 'These novel optical features could easily implement the module of a lens-free optical PUF by placing a silk ID card on the image sensor.'

The diffracted light is unique, 'giving rise to a unique pattern of light,' that is subsequently converted into a digital format and fed into the system as input, researcher and the study's author Young Min Song said.

Should such a system be deployed for user authentication using a smart card, the researchers estimate that faking an authentication key generated from the module via a brute-force attack would take as long as 5 x 1041 years to crack it open, making it cryptographically unbreakable. To give perspective, the age of the Solar System is 4.6 x 109 years.

'To our knowledge, this is the first PUF module designed using silk, a naturally abundant biomaterial,' Prof Young said in a statement. 'It means that we don't need to invest time in developing complicated security keys, nature has already done this for us.'

1 https://www.nature.com/articles/s41467-021-27278-5

KURZ Goes Green with Eco Label Range

Optical and materials security specialist KURZ has introduced a range of sustainable security labels as part of its TRUSTCONCEPT® brand portfolio.

According to the company, the combination of its security features with individually combinable, environmentally friendly substrates means that customers can benefit from sustainable labels without forgoing its tried-and-tested security technology.

TRUSTCONCEPT® (© KURZ).

KURZ is now offering five different Eco Labels, all of which are equipped with the company's TRUSTSEAL® Protect visual security elements for protection against brand and product counterfeiters and which can integrate with its TRUSTCODE® security software for supply chain management and digital authentication.

The five options are:

- **Eco Label Premium** – a wood-free, paper-like label with a matte-gloss surface, 80% of which is made of a waste product from marble decomposition.
- **Eco Label rPP** – a white plastic label made largely from recycled packaging foil.
- **Eco Label wbPP** – a sustainable alternative to conventional plastic security labels. The transparent outer material is made from pulp production residues.
- **Eco Paper Label light** – the use of materials has been reduced to the necessary minimum weight, reducing primary energy requirements, fresh water consumption, and CO2 emissions.
- **Eco Paper Label PCR** – made up of 99% post-consumer recycled fibres without, says KURZ, losing any of its brilliance and adhesion.

ACT Now to Protect Your Intellectual Property Rights

This month's editorial (page 2) makes a longitudinal study of the shifting geo-political forces that have formed the nature of brand protection. Another, more direct, hypothesis is that counterfeiting and other types of brand fraud are straightforward criminal activities with no respect for borders, treaties or the law.

To help enterprises that might be interested in learning how to protect against such criminal activities, the European Observatory on Infringements of Intellectual Property Rights, with support from the Anti-Counterfeiting Technologies Expert Group (EGACT) and the Impact of Technology Expert Group, has recently published the Anti-Counterfeiting Technology Guide[1] (ACT).

The guide takes companies, both large and small, through the steps they can take to protect against fakes by taking advantage of the numerous technical solutions out there to protect ownership rights and supply chains. ACT sets out the main types of anti-counterfeiting technologies, including electronic identification or tracking devices, how to place markers on products or packaging, and other chemical, physical, mechanical, and digital tools. It shows the most cost-effective and practical ways of protecting IP rights, describes implementation requirements and the costs involved.

ACT was prepared by the Observatory on the basis of the research and documentation provided by the Italian Patent and Trade Mark Office, and with the support of contributions from members of EGACT who produced the first version of the guide, creating a knowledge base of the existing anti-counterfeiting technologies. The Observatory adapted that document into the present guide for small and medium sized enterprises (SMEs) and general users. The Expert Group on the Impact of Technologies collaborated in the validation of some of the technologies.

According to ACT, anti-counterfeiting technologies provide tools to help determine whether a product is genuine or fake, or has otherwise been subject to fraudulent activities. They may use different methods to do this – from attaching remote sensors to products to embedding covert identifiers within them – but, essentially, they do it by performing one or more of the following functions: authentication, tracking/tracing, anti-tampering/anti-alteration. Definitions of these essential functions are given in the Glossary of ACT.

The guide goes on to note that anti-counterfeiting technologies differ according to the combination of essential functions they perform, the methods they use to perform them and their mode of inspection – whether they can be verified by human senses or whether a special device is required. However, the characteristic shared by all anti-counterfeiting methods is the use of specific marking devices, known as markers. These are joined inseparably to the products (by various techniques) and contain the specific information that enables the technology to perform its essential function.

The handbook covers all the main types of anti-counterfeiting technology currently on the market, gives a clear definition of each, describes their main characteristics and sets out practical implementation requirements at a glance. It should be an invaluable guide for both experts and those exploring market opportunities for the first time.

1 https://euipo.europa.eu/tunnel-web/secure/webdav/guest/document_library/observatory/documents/reports/2021_Anti_Counterfeiting_Technology_Guide/2021_Anti_Counterfeiting_Technology_Guide_en.pdf

Breaking the Security Mould with MicroEdge

MicroEdge (© Nanopixel).

Nanopixel, a subsidiary of the light science technologies group Lumenco, has announced the creation of MicroEdge™, a patented optical security feature that can be moulded directly into the surface of plastic products or packaging.

MicroEdge features can include a combination of 3D, animated, flip, or on-off images. Nanopixel is in dialogue with product marketers and designers to bring MicroEdge features to product shelves by Q3 2022.

The technology is based on small, light-efficient micro-facets that reflect pixels made of light both above and below the focal plane, which create the 3D animation and other unique visual effects. The floating pixels create an optical image identity that can't be copied by printed 2D decorative packaging, and which is viewable under ordinary diffused lighting conditions.

Since MicroEdge facets are moulded directly into the container, no extra materials are needed to create the effect, making the technology sustainable and eco-friendly. The process does not add cost to the manufacturing process and is, therefore, extremely economical, says the company.

'The design possibilities are endless' said Mark Raymond, CEO of Lumenco/Nanopixel. 'We see MicroEdge enhancing products across CPG and hard goods categories such as beauty, liquor, beverage, electronics and home décor. Brands can combine a variety of dynamic effects into the same optical feature and then securely and economically emboss the feature directly into the surface of virtually any plastic product or package during the injection moulding process.'

MicroEdge can be incorporated into a variety of resins, such as PET, PP, PE, PVC, and PC. Because the micro-optic tooling is incorporated into the injection mould itself, it does not require the addition of new materials. And neither will it interfere with the recyclability or compostability of products that have been designed to be eco-friendly.

Technical assistance during production testing and development of MicroEdge was provided by Alba Enterprises, an industry leader in plastics manufacturing.

Founded in 2012 and headquartered in Englewood, Colorado, Lumenco's mission is to develop surfaces that manipulate light and colour like no one else in the light management world. The company holds over a dozen patents in micro-optics and associated software, and its micro-optic technologies include a wide range of anti-counterfeiting and copy-proofing solutions in ID documentation, currency, and brand protection; glasses-free 3D content viewing; disruptive industrial solar concentrators; LED lighting, and ultra-thin photovoltaic technologies for solar arrays.

Nanopixel is the brand identity division for the marketing and sales for MicroEdge and other Lumenco technologies. Its portfolio also includes NanoLock™ 40 and 70 micron tamper-evident labels with 3D motion effects, NanoMoví™ micro-lens 75-125 micron packaging film and Dycyfer™ micro-mirror packaging films. Other products and solutions include customisable security inks, blockchain verification and track and trace.

A video of MicroEdge can be viewed here www.youtube.com/watch?v=HcyP2igJX-s.

TruTrace and Laava *(continued)*

The development of the Smart Fingerprint was in response to what the company sees as the drawbacks of QR codes. In particular, it states, the latter were designed for automation, but never for authentication. And as the data is directly encoded, they are exposed and vulnerable to malicious attacks, in particular spoofing (whereby counterfeiters create QR codes online easily and instantaneously, then put them on fake products with a fake claim of authenticity, with consumers having no way of identifying whether the QR code they are scanning is legitimate or not).

According to Laava, every Smart Fingerprint is a uniquely generated image, with the data removed from the code and turned into a unique scannable mark, or optical fingerprint. The Laava ecosystem operates securely in the cloud. Only Laava customers can generate Smart Fingerprints, and only the Laava scanner can read them. And because every scan is recorded and tracked, the technology lends itself very well to blockchain.

Since their launch in 2019, more than five million of these Smart Fingerprints, have been deployed around the world on products ranging from cherries to wine, PPE, documents and NFTs.

Under the agreement, both parties will pursue opportunities to promote the individual products, services, and offerings of the other to appropriate customers, partners, and other commercial contacts.

'Over the past several months we have seen significant stress within the global supply chain and with these significant delays and challenges it has become imperative more now than ever to ensure that products are safe and consistent,' said Robert Galarza, CEO of TruTrace. 'Our strategic partnership helps fill many of the gaps by combining the best features of our software platform with patented, next generation, optical fingerprint technology which serves as 'on package' authentication to provide a unique customer experience driven by blockchain, traceability and testing.'

Recommerce Brings Fashion and Apparel Fraud Online

Recommerce – the sale of pre-owned goods – is a nearly $40-billion-a-year industry and is expected to double soon. In an article on Bloomberg Law[1], attorneys from international law firm Perkins Coie examine the IP infringement questions facing resellers and brands in the resale marketplace.

The sale of pre-owned goods has ballooned to a $36 billion industry[2], and is expected to double in the next five years. The recommerce market is diverse – bricks-and-mortar are still relevant, but the future of resale is far more suited to the digital environment.

Consumer demand for sustainable goods has created systemic change in the fashion and apparel industry. Part of the trend is the environmental and economic advantages that can be gained from recommerce, but these come with their own set of risks – particularly from counterfeits.

A 2018 study[3] by the US Government Accountability Office found that 40% of a sample of goods purchased on popular eCommerce marketplaces were counterfeit. This, of course, creates reputational and financial risks for resellers, whose success is directly tied to consumer trust. Fakes also pose problems for brands. In 2017, counterfeits amounted to a multi-billion dollar[4] problem. They also significantly harm reputation, goodwill, and brand value.

Despite the counterfeit risk, consumer demand for second-hand products continues to grow. This may be why some brands have invested in or partnered with resellers. For example, The RealReal has established partnerships with Gucci, Burberry, and Stella McCartney, and Alexander McQueen recently partnered with Vestiaire Collective. These partnerships allow brands to authenticate pre-owned goods, which promotes sustainability and fights counterfeits.

In addition to the risk of knockoffs, recommerce brings the risk of purchasing stolen goods. State and local second-hand dealer laws were established to guard against the trafficking of stolen goods. However, they place onerous licensing, information collection, ID verification, reporting, and auditing requirements on resellers. Violations can result in criminal fines or imprisonment.

In response to the abuses of what is widely considered to be the unregulated recommerce online market, eCommerce sites are an increasingly popular target for regulators, so it is only a matter of time before enforcement authorities begin looking for second-hand online dealer violations.

So, it seems that what is true in the physical world is equally applicable to the virtual one. Piracy is a major threat to resellers and brands alike, but it can be managed through strategic partnerships and proper authentication.

1 https://news.bloomberglaw.com/tech-and-telecom-law/the-resale-market-boom-what-sellers-and-brands-need-to-know
2 https://www.prnewswire.com/news-releases/thredup-releases-its-ninth-annual-resale-report-with-first-ever-impact-section-301317829.html
3 https://www.gao.gov/assets/gao-18-216.pdf
4 https://www.researchandmarkets.com/research/hzjb9c/global_brand?w=4

RECONNAISSANCE AUTHENTICATION & BRAND NEWS™

Publisher: Reconnaissance International Ltd.
Editor: Francis Tuffy (right). francis@recon-intl.com
Contributors: Astrid Mitchell, Nicola Sudan.

Annual subscription rate: from £755 plus postage
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ISSN 2755-5275

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