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Leather research and innovation at the IULTCS Congress 2019



As reported by the CICB Press Office, the 35th IULTCS Congress (International Union of Leather Technologists and Chemists Societies) gathered in Dresden, Germany on the 27-28 June 2019. Dozens of projects have shown that research and innovation in the leather industry have only strengthened and gathered the support and decisive intelligence of entrepreneurs, technicians and academics from around the world. There were over 450 congress attendants from 32 different countries, following an agenda of lectures and debates about experiences in chemistry, sustainability, and production technology.

The Brazilian delegation was one of Dresden's most representative, composed of professionals from tanneries, the chemical industry, laboratories, the press, and academia. There was also a lecture on the Brazilian Leather Certification of Sustainability (CSCB) and an exclusive space for the presentation of the Brazilian potential and the Leather Preview collection. The two initiatives were supported by the Brazilian Leather — an export stimulus project developed by the Centre for the Brazilian Tanning Industry (CICB) and the Brazilian Trade and Investment Promotion Agency (Apex-Brasil).

Ernani Pohren, CEO of Química Carioca, participated in the entire schedule of events and highlighted that the congress was able to bring together high-level technical discussions and themes from the day-to-day of those who work with leather. "It was an interesting opportunity to talk to colleagues about the challenges of the industry and discuss points that are fundamental to the whole chain, such as communication and sustainability," he said.

Aline de Cássia Campos Pena's two-year UFRGS master's study on the actions of micro-algae on tannery effluents was presented in the form of a poster at the Congress. She'll soon be starting her doctorate, and emphasized that the IULTCS made public a number of unpublished and innovative findings for the sector. For Lucas Zoldan, representative of the Senai Institute of Technology in Leather and the Environment, the presentation of solutions was one of the Congress's strongest points. One of the projects showed the possibility of differentiating leathers and alternative materials through infrared spectroscopy (a technique that identifies the molecules of a given material), in a process that is even faster than those available today.

LASRA's four representatives at the Congress; Dr Rafea Naffa, Dr Sujay Prabakar, Dr John Liu and Mr Ethan Zhang delivered three presentations and an oral poster. Abstracts of these can be found in Library additions, later in this newsletter.

The 35th Congress of IULTCS was able to gather a significant sample of these activities that are being carried out around the world and also providing opportunities for creating relationships and business contacts. The next edition of the event will be in 2021, in Addis Ababa, Ethiopia from October 20th-23rd.

Pictured, Dr Prabakar, LASRA

ACLE opens for visitor registration

Visitor registrations are open for the All China Leather Exhibition (ACLE). To be held September 3-5 in Shanghai, the trade show is expected to welcome around 23,000 visitors over the three-days.

The ACLE brings together over 1,200 exhibitors, of which 30% are from abroad, including from Brazil, France, Germany, Italy, Japan and the U.S., among others, who present their offer of raw hides, leather, chemicals, footwear components, accessories, machinery and synthetics aimed at the footwear, leather goods, garment, automotive and furniture manufacturing bases in China and ASEAN.

This year's Shanghai Shake-Up conference 2019 will be divided into two discussion panels; 'How to Transform the Role of the Tanner?' and 'Why Aren't Designers Using Leather?', held under the theme 'Redesigning a Future for Leather'.

Among the highlights, Zschimmer & Schwarz will be showcasing some new applications. These will include Contripon RM, which Zschimmer & Schwarz has said minimises the presence of chromium VI in crust or finished leather. It is applied to the flesh side in one or more spray applications. It can also be

used in wet-end processes. "It adds further safety to the established measures that prevent the formation of chromium (VI)," the company has said.

Another highlight will be Syncurol HS, designed for the production of soft leathers with high resistance to light and heat. It is especially suitable for making automotive upholstery leather.

To register to visit the ACLE, please click [here](#).

Prof Mitloehner issues wake-up call to leather industry



No presentation at the World Leather Congress in New York on July 16 commanded more attention or generated more discussion among delegates than Professor Frank Mitloehner's.

Most of the points he raised are covered in an article in World Leather June-July 2019, including his explanation of the need for us to use all available resources to feed a global population that is on track to exceed 9 billion people by 2050. Not to use agricultural land on which we cannot grow edible (for humans) crops, but can grow pasture that ruminant livestock can then convert into protein that we can consume, would be folly, he said. And the fact that the by-products of beef cattle give us 400 other products we can use, the most obvious of which is leather, makes this supply chain all the more valuable.

In response to a question about opposition to livestock farming and meat consumption, Professor Mitloehner told World Leather that, in his view, only 1% of campaigners are so entrenched in their views that they will not listen to counter-arguments, even though this 1% is very vocal. He said he would continue to use science and reason to present a pro-livestock, pro-meat and (by extension) pro-leather point of view, but pointed out that emotional arguments must also be part of the battle. "People also choose what they eat and what they wear based on emotion," he added. "To ignore emotion in this discussion would be wrong. Industries that are connected to meat, including leather, have been asleep

at the wheel on this and the first thing they need to do is wake up.”

From *leatherbiz.com*

China's economic growth at lowest in 27 years

China's gross domestic product (GDP) grew 6.2% in the quarter ended June, representing the slowest quarterly growth rate since 1992 and down from 6.4% in the previous quarter. According to China's National Bureau of Statistics, the Chinese economy will continue to face "downward pressure" in the second half of 2019 as the U.S. – China trade war uncertainty continues. Both the country's exports and imports are reported to have declined for the first six months of this year. In dollar terms, China's exports fell 1.3% year-on-year for the first six months of 2019, and imports declined 7.3%. Exports to the U.S. decreased 8.1% in the period, while imports from the U.S. to China dropped 30%, year-on-year.

Industrial output increased 6.3% annually in June, compared with 5% growth in May, while retail sales grew 9.8% in June, from 8.6% in the previous month. However, despite the tax cuts to help boost the domestic economy, the automotive sector is said to have been particularly impacted by low demand as Chinese consumers are less willing to spend on high price tags and are more concerned about the rising levels of pollution.

From *CNN/Financial Times*

Difficult year for UK leather industry

Figures from the UK leather industry show exports fell 15% in value and 12% in volume in 2018 in what Leather UK describes as “a difficult year”. The value of raw material exports fell 22% compared with 2017, while the volume fell 13%, reflecting a decline in selling prices. This is in line with the rest of the world. Exports of finished leather were down 10% in value but up 8.1% in volume, reflecting the falling prices for leather. Chamois leather exports fell 13.8% in value and 21.6% in volume, suggesting that while overall sales had fallen, prices had been maintained or improved. “For the UK market specifically, the uncertainties around Brexit will undoubtedly have had an impact on certain sectors but would have been only one of the reasons for the negative results compared to 2017,” said the association.

Italy and China remained the key markets for raw material exports, accounting for 75% of the total. Exports to Italy increased by 5% and those to China fell by 6% compared with 2017. Turkey moved into the top five export destinations as exports of sheepskin rose by 91% in value and 127% in volume. The UK leather industry is comprised of producers of automotive, upholstery, shoe upper and sole, gloving, chamois, equestrian leather and wet blue leather.

From *leatherbiz.com*

Burberry sets new environmental targets on raw material sourcing

Burberry has set two new climate goals approved by the Science Based Target initiative (SBTi) to reduce absolute scope 1 and 2 greenhouse gas emissions 95% by 2022 from a 2016 base year, and to reduce absolute scope 3 greenhouse gas emissions 30% by 2030 from a 2016 base year. The scope 1 and 2 target focusses on emissions from the Company's direct operations, including electricity and gas consumption at its stores, offices, internal manufacturing and distribution sites, while the scope 3 target

relates to indirect emissions in its extended supply chain, which includes the impact from the sourcing of raw materials and manufacturing of finished goods. According to Burberry, the targets covering greenhouse gas emissions from Burberry's operations (scopes 1 and 2) are consistent with reductions required to keep warming to 1.5°C, the most ambitious goal of the Paris Agreement.

"This expands the reach of our existing goal to become carbon neutral in our operational energy use by 2022, and we are already carbon neutral across the Americas region, EMEA retail stores and our UK operations", said the Company in a statement. Burberry says it is also on track to achieve its RE100 commitment to go 100% renewable as the Company obtains 58% of its total energy, including 68% of electricity, from renewable sources. "Changing the system requires collaboration, and we will be working closely with our supply chain partners to take the action needed to stay on track and achieve our goals", said Pam Batty, VP Corporate Responsibility, Burberry.

From *ILM*

FDRA Launches New Sustainability Website



A site to educate, empower and activate the footwear industry

powered by **FDRA**

To help companies better understand and implement sustainability targets and programs, FDRA has developed a new resource centre. FDRA's defines shoe sustainability as Shoe design, development, manufacturing, distribution, and selling processes that minimize negative environmental impacts, conserve energy and natural resources, are safe for employees, communities and consumers, and are economically sound. Check it out [here](https://www.fdra.org)

From *FDRA.org*

TFL releases Spring/Summer 2021 Colour Trends

The specialty chemical supplier has released its new Colour Trends Catalogue for the season Spring Summer 2021, aimed at the leather garment, footwear, accessory and upholstery sectors.

As usual, the colour trends in the TFL catalogue are divided into “Wearing” and “Living”, with each segment having a dedicated section within the publication. Wearing comprises inspirations and colour trends for garments, footwear and accessories, while Living features all colours that will decorate the season’s interior designs.

For the Spring Summer 2021 season, Wearing unveils the treasures of travelling, emotions become fashionable and the Eastern flavoured elegance seeks to inspire. Two trends stand out in this section; soft nuances and digital outfit. Accessories catch attention throughout the collection. Lambskin and nubuck calfskin are most popular for the season's more elegant and sophisticated footwear, which features a silky look, and are complemented by glossy reptile leathers with dazzling pearly reflections.

“Living” focuses on freedom and having a good time at home. The freedom to be daring with colours and have fun with fabrics, leathers and textures to create strikingly different atmospheres to cope with the day-to day frenzy of constantly adapting the home to suit needs, mood and seasons. The coordinated soft furnishing of choice is strictly recyclable and compostable. Embracing the concept of ethical design, new tanning products are free from heavy metals and solvents, dyed in warm, beautifully burnished nuances.

In addition, the catalogue presents TFL Micro Tec; an innovative technology for the finishing of leather articles to obtain a more natural appearance without overloading the grain. For further information, visit www.tfl.com

New Zealand label transforming unwanted leather into playful handbags



Using off-cuts and dead stock, two sisters are creating colourful cross-body bags, totes and boat bags

that wear beautifully over time. New Zealand-based designer Georgia Davison first began working with leather in 2012. "I remember getting a leather pillowcase from a fair, and [making] myself a funny little bag," she says. "I got so many compliments on it for as long as I wore it."

Davison started working at night, teaching herself how to best use the material and experimenting with making bags. "I never had a deliberate intention to launch a brand as such, or even turn it into a business," she says. "When you're an innately creative person who makes your work by hand, it's very personal to you. That work then somehow becomes your business – and that is a whole new process in itself." Along with her sister Ruby, Davison produces everything in an open-plan studio in Auckland using materials from around New Zealand and Australia. "Eighty per cent of our leather is dead stock," Davison says, meaning she uses end-of-line leathers, mostly from fashion houses that don't have a use for it anymore. "Some leather I use has been at the suppliers since the '90s, and it's covered in dust. So it's really nice to be able to use these materials."

The colours, textures and patterns Davison picks up in the off-cuts set the tone and feel for each Georgia Jay collection. The sisters hand-cut every hide, and because of the nature of the materials only produce very limited runs and one-off pieces. The vibrant green [Little Ombra](#) bag is made with leather from Tasman Tannery in Wanganui, New Zealand. Originally premium upholstery leather with an oil finish, the material softens, moulds and wears beautifully over time. The classic midi-size handbag is finished with asymmetrical stitching and a rounded leather shoulder handle. "We like to play with seam lines, which give each style a little more personality. Whether that's an asymmetric dart within the body, or graduated seams, or tuck pleats to create volume," Davison says.

The current collection also includes coin pouches, shoulder bags, cross-body bags, totes and boat baskets. Prices range from \$105NZD for an [oiled-leather curved card-holder](#) to \$490NZD for [a soft, pebbled-leather carryall](#), and colourways cover butter, pear, mustard, emerald, coco, baby blue, navy and black. The label has also released a number of one-off styles made from limited chalk-coloured crocodile-embossed leather dead stock.

From *broadsheet.com.au*

Fire safety of furniture and furnishings in the home



The Government has urged furniture manufacturers to find ways to make foam-filled furniture safer by enacting a Product Safety Policy Statement, which means manufacturers and retailers must find ways to make the products safer. Commerce and Consumer Affairs Minister Kris Faafoi says about 80 percent of new and existing household furniture is foam-filled, including lounge suites, some mattresses, and seats," Faafoi said. "These are highly flammable when ignited and the foam can catch fire at relatively low temperatures, burn quickly and intensely, and emit suffocating poisonous smoke that can spread quickly through a home." Coroner's reports show more people die from smoke inhalation than burns from flames.

The UK introduced Furniture and Furnishings (Fire) (Safety) Regulations in 1988 and Government commissioned research conducted since the introduction of the Regulations indicates that by 2000 at least 710 lives have been saved.

LASRA has IANZ accreditation for all current AS/NZS standard flammability testing. For further information on the flammability testing of foam for furniture, please contact LASRA's senior technical officer, Mr Peter Roy, peter.roy@lasra.co.nz

You can access this News Hub story that appeared on the 22 July [here](#)

SLG reduces its per-hide carbon footprint by 85%

The Scottish Leather Group (SLG) is on track to achieve a reduction of more than 85% in the environmental footprint of its leather. Measuring the carbon intensity of the leather it makes as carbon dioxide equivalent (CO₂ eq), the group calculated 10.9 kilos of CO₂ eq in 2003. In 2019, it is on track to

cut this figure to 1.5 kilos.

Explaining these figures in the group's 2019 sustainability report, Sustainability and Innovation Director, Dr Warren Bowden, said that using renewable energy had made possible what he described as a "dramatic" reduction in the carbon intensity of SLG leather. The group's intention is to reduce this carbon intensity even further. Bowden reports that SLG has partnered SHARC Energy Systems, a renewable energy company that specialises in recovering heat from wastewater to provide heating for water and for buildings. "This will lead to the installation of a zero-carbon water heat system to meet some of our direct water and indirect space heating demands," Dr Bowden explained. "This should lead to an even lower carbon intensity for our leather going forward."

From *leatherbiz.com*

What's new July 2019: papers added to the LASRA Library

Biotechnology for environment-friendly leather production

J.Y. Liu; Geoff Holmes

LASRA research is guiding the application of biotechnology to help the New Zealand leather industry develop environmentally sustainable leather processes. Using 16S rRNA gene sequencing, we have isolated and identified a number of indigenous bacteria from the leather industry environment which are being adopted to develop benign leather processing technologies. We isolated and identified several *Bacillus* strains from a biofilter used in a leather manufacturing plant which exhibited sulphide oxidation activity, which are being applied in bioremediation of volatile organosulphur compounds emitted by leather products. We also discovered a strain of *Stenotrophomonas* spp. with significant and beneficial proteolytic activity in a tannery sludge. The identified strain not only displays collagenase activity but also the ability to reduce hexavalent chromium to trivalent chromium, making it an ideal candidate for biodegradation of tanned waste. Recently we revisited the natural autolytic processes of degradation of untreated pelts to guide a natural depilation method without any need for additional chemical treatment. In controlled experiments the wool could be removed completely from follicle after 2 days, without obvious damage and leathers could be processed with mechanical properties comparable to conventionally processed counterparts. The alkaline protease activity of the isolated bacteria is responsible for the observed natural unhairing.

Proceedings of the 35th IULTCS Congress, 2019

Towards a molecular level understanding of chrome tanning

Yi Zhang; Jenna K Buchanan; Geoff Holmes; Sujay Prabakar

Abstract. Synchrotron based small-angle X-ray scattering (SAXS) is a powerful technique that has helped us understand the changes in molecular-level collagen structure during tanning and denaturation (shrinkage). Based on SAXS results from real-time denaturation experiments on leather samples, we established a mechanistic model of chrome tanning indicated by the structural changes of collagen. It suggests that only a low level of chromium is effectively involved in cross-linking with collagen, highlighting the overuse of chrome during conventional tanning processes. Any extra amount of chrome added, however, can support the stabilisation of collagen – possibly via a non-covalent mechanism. Such a mechanism points towards a more environment-friendly tanning method by using suitable supplementary reagents to benefit the tanning effect non-covalently instead of by chrome. Also, by pre-

treating with complexing agents such as sodium formate and disodium phthalate, as well as nanoclay (sodium montmorillonite), the uniformity of chrome penetration through the bovine hide collagen matrix can be improved significantly. These pre-treatments effectively reduce the reactivity of chromium during its cross-linking reaction with collagen while retaining bound water. However, collagen pre-treated with a covalent cross-linker (glutaraldehyde) results in a decrease in both the chromium-collagen cross-linking and bound water while improving uniformity. These molecular-level insights can be developed into metrics to guide us towards a more sustainable future for the leather industry. Further, coating on collagen fibrils can provide a pseudo stabilisation effect by increasing the hydrothermal heat resistance of collagen. Overall, synchrotron SAXS provides valuable information about changes in the collagen structure that could lead to more efficient use of chrome (or other tanning agents) in the global leather tanning industry.

Proceedings of the 35th IULTCS Congress, 2019

Strong skin, not always thick: Comparative structural and molecular analysis of deer skin and cow hide

Rafea Naffa; Catherine Maidment; Geoff Holmes; Gill Norris

A comprehensive analysis of the molecular and structural components of deer skin and cow hide was undertaken. These skins are known to be strong. However, they derive their strength from different combinations of molecular and structural properties. Firstly, the physical properties of deer skin and cow hide including tensile strength, tear strength, and denaturation temperature were measured. Secondly, the structure of the collagen fibrils and glycosaminoglycans was investigated using transmission electron microscopy (TEM) and small angle X-ray scattering (SAXS). Finally, the chemical composition of deer skin and cow hide, such as amino acids, crosslinks and glycosaminoglycans, were analyzed. Our results showed that the physical properties of deer skin and cow hide are derived from different combinations of several chemical components, resulting in a different architecture. It was found that the large and “wavy” collagen fibres in deer skin are made up of collagen fibrils with small diameters. Additionally, deer skin fibrils appeared to be linked by regular arrays of filaments of large glycosaminoglycans that are distributed uniformly. Deer skin contained a higher proportion of trivalent collagen crosslinks. In contrast, the collagen fibrils in cow hide were larger, contained a diverse glycosaminoglycan distribution and a higher proportion of tetravalent collagen crosslinks, resulting in straight collagen fibres. This study suggests that although deer skin and cow hide are both strong, they have different structural and molecular features.

Proceedings of the 35th IULTCS Congress, 2019

High-efficiency chrome tanning using pre-treatments: synchrotron SAXS and DSC study

Ethan Zhang, Jenna Buchanan; Geoff Holmes; Sujay Prabakar

Pre-treatments are widely used during tanning processes to improve the performance of the main tannage. Synchrotron small-angle X-ray scattering (SAXS) and differential scanning calorimetry (DSC) were used to study four common types of pre-treatments, viz. a monodentate complexing agent (sodium formate, SF), chelating agent (disodium phthalate, DSP), covalent cross-linker (glutaraldehyde, GA) and nanoclay (sodium montmorillonite, MMT) to learn about their effects on chromium-collagen cross-linking reaction during tanning. Based on the results, the performance of chromium-collagen cross-linking with and without individual pre-treatments was presented based on five parameters: degree of cross-linking, level of hydration, hydrothermal stability, uniformity through the leather cross-section and the relative uptake of chrome. Comparison with ThruBlu chrome tanning, at the same chrome offer levels, on leather

pre-treated with SF, DSP and MMT showed improved hydrothermal stability, uniformity and an increased level of hydration, while GA pre-treated leather showed a decreased level of hydration. All of the pre-treatments reduced surface fixation by decreasing the reactivity of chromium with collagen. Changes in the reaction performance can influence both the properties of the leather products as well as the efficiency of the leather manufacturing process. Insights into the structural changes of collagen during tanning with varied reaction conditions can help guide the design of novel, benign tanning processes with reduced environmental impact.

Proceedings of the 35th IULTCS Congress, 2019. Poster Presentation

The 60th John Arthur Wilson Memorial Lecture: A Future for Leather!

by Gustavo Gonzalez-Quijano

Until not so long ago, tanners did not need to promote their leathers particularly, as buyers approached them in search of the sought material. Leather was bought, not sold. Today, things have changed. Leather still exerts its appeal, but tanners have to deploy all their marketing skills and competences for attracting customers.

With the turn of the Millennium leather has entered a new chapter in its long history. And the changes are shaking up longstanding habits. Tanners have started experiencing increasing societal pressures affecting the perception of leather by the general public.

Concerns over social or environmental credentials have impacted the leather trade. Also, the identity of leather is being increasingly challenged. Synthetic or plant-based alternatives shamelessly abuse the name 'leather' while they rant and rave about the genuine material. And one can find all over the press, internet and social media pictures and stories of irresponsible leather producers. Moreover, last century failed to put an end to the sector's most important barriers to trade; export restrictions on raw materials.

What needs to be done for leather looking to the future with confidence?

This paper will review four areas in which leather faces major challenges today and in the coming years. They concern aspects of the trade and industry that affect operators independently of their location. It will examine the leather authenticity challenge in the European Union, illustrate two strategic social policy areas in which European tanners are active, describe the achievement in the area of the environmental footprint of leather, and explain the need for a global sector agreement for the trade in hides, skins and leather.

In the conclusion, this paper will emphasise the importance of sector associations in addressing the challenges of the leather industry and call for more and deeper cooperation between all the sector's stakeholders for ensuring a bright future for leather.

JALCA July 2019

Leather Species Identification via Mitochondrial DNA Polymerase Chain Reaction

by Xiang Zhang and Steve Lange

Currently the identification of leather species is mainly via a skilled operator using optical microscopy and an extensive visual reference library. However, due to the limitations of optical microscopy and in

cases where the leather surface is heavily corrected or finished, it is not always possible to accurately determine the leather species. Therefore, it is crucial to develop a reliable and easy to perform approach to overcome these limitations. In this paper, we used the unique DNA sequence present in every species to identify leather. The conversion process of making leather destroys much of the DNA present but the high copy number of mitochondrial DNA (mtDNA) in relation to nuclear DNA makes some mtDNA likely to survive and be detected via polymerase chain reaction (PCR). However, leather DNA is highly degraded and inhibitors present in the extracted DNA make successful PCR challenging. There are only a few related works reported in the literature attempting to use DNA for leather species identification and they provide limited technical details. In this study, species-specific primers for PCR were designed, conditions for DNA extraction from leather followed by PCR were optimized, and a detailed protocol was also provided. As a proof of concept, our approach demonstrated that the species of leather can be reliably detected via PCR targeting mtDNA.

JALCA July 2019

Limiting Microbial Activity as an Alternative Approach of Bovine Hide Preservation, Part I: Efficacy of Developed Formulations

by Majher I. Sarker, Wilbert Long III and Cheng-Kung Liu

The traditional wet salting technique of bovine hide curing requires 95% or more saturated brine solution which generates a huge amount of pollution and salinity in the form of total dissolved solids (TDS) and chlorides (Cl-) during leather processing. Therefore, much attention is currently placed on tanneries requiring reduction or eliminate the use of sodium chloride as a raw hide/skin preservative. For the preservation of hide it is essential to arrest microbial attack as the collagen-breaking enzymes called collagenase produced by the bacteria can cause serious degradation on hide which leads to the putrefaction of raw hide before converting them into leather. In this research effort, a number of formulas have been developed and evaluated for their efficacy in preserving bovine hide for 30 days or more. This attempt has been made to evolve a least chloride containing curing system for salinity abatement, where 35% saturated brine is used as the base solution. The developed formulations have been evaluated with better efficacy than the conventional technique on limiting bacterial growth, controlling yeast and mold during the storage period of cured hide. The alternative methods also offer quick rehydration of cured hide during leather processing and Airborne Ultrasonic scanning detects no detrimental impact on alternatively cured hides. Therefore, this new development is ideally suited for hide preservation through better protection of hide from microbial degradation and improved conservation of environment in compare to the traditional method.

JALCA July 2019

Funimation releasing red leather jacket from 'Akira'



Amid the making of the long-awaited live action movie bringing this cult classic to the silver screen, the legendary anime *Akira* is also celebrating its 30th anniversary in style, with the release of Kaneda's iconic red leather jacket.

American anime distributor Funimation announced recently at the Anime Expo 2019 that the company will be releasing a replica of the protagonist's aggressively red leather bike jacket in honor of the 30th anniversary of *Akira*. The announcement was followed up with a post on Twitter giving fans a first look at how the jacket will be in real life, along with a shot of what appears to be a collector's box that comes with the jacket.

From *hypebeast.com*