

# The Evolution of Footwear For Sports

Peiwen He, Yuehan Li, Na Li

Chengdu Neusoft University, Chengdu 611844, Sichuan, China

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**Abstract:** The first footwear was not made to any specifications, and shoes of men and women once were very similar, while looks, designs, and materials varied with the changes of social status or classes. The change of sneakers are highly related to the evolution of materials, as well as the sports itself. New technologies have increased the performance of sneakers. Those who are knowledgeable about the evolution of sneakers predict that the future of footwear will be self-lacing performance sneakers.

**Keywords:** Footwear; Sports; Self-lacing; Materials

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## 1. Introduction

People wear shoes for reasons such as fashion, protection, and specific activities. Shoes unquestionably plays an important role in one's life. These accessories you currently wear on your feet have an approximately 10,000-year history, and the earliest known shoes are sagebrush bark sandals dating since around 8000 BC, unearthed in the Fort Rock Cave in Oregon in 1938. The colors, materials, and looks of the footwear have altered drastically over thousands of years with the development of the industries, civilizations, and technologies. Fast forward to the 18<sup>th</sup> century, cloth-topped shoes were invented while boots grew exceedingly popular. The first rubber soled sneakers appeared later in that century, which are called "plimsolls."<sup>[1]</sup> This kind of shoes were widely worn by vacationers and sportsmen, especially tennis and croquet player for comfort purposes. The modern sport shoes were born in the final decades of the 19<sup>th</sup> century. Britain introduced a variety of games and athletic activities because of social, industrial, and commercial changes. Sports created physical and social needs and in seeking to cater demands of athletes, shoemakers then drew on ideas of how footwear could be used within sporting practices and exploited modern manufacturing and commercial processes. In the foreseeable future, shoes will use technologies such as Electro Adaptive Reactive Lacing known as E.A.R.L. Moreover, thermoplastic polyurethane (TPU), a solid granular material, will be used in the production of sneakers. TPU can be expanded to form small energy capsule contributing to the one-of-a-kind Styrofoam midsole.

The first footwear was not made to any specifications, as in different territories there were extremely different materials used for making shoes, and people's needs for shoes were different due to various environmental factors. For example, in Northern areas, fur and hay were added to the thick leather shoes to keep warm while in the Southern areas, palm leaves or papyrus fiber were mainly used to make the sandals. Except for the weather, people wore shoes to guard their feet against rocks or harm.

Our feet were made to walk, run, and climb once in a while. Bare feet can be great at all of that. Greek runners participated in the competition at the first Olympics in 776 B.C. without shoes, while later sandals were worn by sportsmen and sportswomen to guard their feet against outside influence. Walking was the main way for traveler at that time because of no bicycles, cars, or planes in 1500s. To make their feet feel more comfortable, they put some moss on their soles to give a little bit of cushioning. During the time from 1600 to 1750, shoes of men and women were very similar, while looks, designs, and materials varied with the changes of social status or classes. It is the norm for common people to use thick black leather heels, but the heels for the aristocrats' shoes were made out of wood.

Leather was the traditional material used as soles, but rubber is more flexible, elastic, and bouncier than leather. In 1832, Wait Webster of New York received the earliest patent for the production of footwear based on rubber soles. Later in 1839, Charles Good-year found a way called vulcanization that adding Sulphur during the manufacturing process made rubber more elastic and durable. It makes the production of rubber-soles shoes easier and keeps them from becoming hard and fragile when the weather gets cold, soft and gluey when hot. The patent for spiked sneakers was first awarded in UK during the year 1861<sup>[2]</sup>. The sneakers were first used by cricket players, but was soon embraced by track runners. In 1892, more cozy rubber-soles shoes with canvas tops made by the U.S. Rubber Company appeared, known as Keds. Before that, people used to wear plimsolls, which were very rough.

## 2. Origin and development

The mass production of sports footwear began in 1917. With basketball becoming popular, Converse Inc. noticed the potential market value to design basketball shoes for players to wear. After research and development, in 1923, Marquis Converse created the All-Star shoes, which were Chuck Taylor's signature basketball shoes. The All-Stars shoes which became the first mass produced sneakers for the popularity of basketball in the USA and still are the first mainstream pair of converse shoes that we see today. As for materials, it used a very thick rubber sole with canvas or leather top.

Sneakers became well-liked world widely in 1924, when a man called Adi Dassler, after his returning from World War I, created Adidas sneakers in the laundry room at his home in Herzogenaurach, Germany. He helped develop spikes for track running in many sports events. For example, to improve the feature of spiked sneakers, he used canvas and rubber instead of the former clumsy heavy metal spikes. At that time, the electricity supply in Herzogenaurach was undependable, so he had to power his equipment by pedaling a fixed bike sometimes. In 1936, Dassler encouraged American runner Jesse Owens to wear his hand made sneakers at the Olympic

Games in Summer. The name and reputation of Adidas became famous around the world after Owens' 4 gold medals. Before World War II, his shoes business was so successful with sales of around 200,000 pairs of sneakers every year, thereby becoming the most popular sport shoes brand around the world.

During World War II, for military reasons, rubber was widely and urgently in need. As a result, several sneaker factories were converted into workshops for military supplies. Around this time, Adidas factories were almost destroyed by US forces as they were making weapons to confront tanks, but was saved by his wife convincing the GIs that Adidas was only interested in making athletic shoes. American occupying powers then turn out to be main customers of Adidas sneakers<sup>[3]</sup>. In the 1950s, after watching James Dean wear sport shoes in the hugely popular movie, *Rebel Without a Cause*, majority of the youngsters started wearing them, thus creating a trend. But before that time, the main function of sneakers was ultimately about improving the performance of sportsmen and sportswomen.

In 1964, the today's famous shoe manufacturer, Nike, was started by a track coach in University of Oregon, Bill Bowerman, and one of his sprinters, Phil Knight. Nike was focused on running shoes and track spikes at that time. The tick-shaped logo of Nike was designed by a student at the cost of only \$35. The first waffle sole for sneakers was created by Bowerman when he was eating breakfast at home. He poured rubber into his waffle iron. In 1970s, as jogging became famous, it helped shoe manufactures sell their products to all kinds of buyers, not just athletes.

The market for sneakers really reached the peak when Michael Jordan signed a contract with Tinker Hatfield to wear Nike basketball sneakers called AJ1 in his NBA games in 1984. AJ series are still one of the best-selling and iconic sneakers both in the fashion and sports industries even though Jordan retired from the game years ago. Competitors such as Adidas, Nike, and Reebok use wilder colors and play around with laces to alter the looks of nowadays sneakers. Currently sneakers are produced for every sport, such as jogging, climbing and cycling, etc. New technologies have increased the performance of sneakers. Nike Air Force used gas in the mid-sole for better cushioning, while Reebok pumps gas into the sole of sneakers to make them feel much more cozy. There are many more different techniques used to make sneakers. For example, Spira Footwear even use springs in soles to decrease the pressure on feet.

In 2000, the San Francisco's Museum of Modern Art hosted an exhibition called "Design A foot: Sneaker Design, 1995-2000." This exhibition made people realize that sneakers are a form of self-expression and not just functional playthings as they are an important aspect of the urban nomad.

Those who are knowledgeable about the evolution of sneakers predict that the future of footwear will be self-lacing performance sneakers. Velcro, bungee cords or zippers will be used, along with more stretch material and brighter colors. There will be more features like lightweight Nike Fly-wire technology top surface, cushioned mid-sole for comfort when exercising, and rubber out-sole for flexible durability. With the development of science and new technologies, there are many materials used for shoes production, such as TPU, which I mentioned before. And the BOOST foam, which can return the highest energy to athletes among all sneakers currently available for selling. This material was developed by the Innovation Team after numerous temperature-sensitive tests, thereby making it three times more temp-resistant and durable when compared to EVA<sup>[4]</sup>. The first performance sneaker of Nike using the adaptive lacing are pretty revolutionary. There is a sensor which can detect when you step in and the system will help the shoes tighten automatically with two controls on the side to adjust. This is revolutionary, completely avoiding a step engrained in our everyday life, tying a shoe lace. This is problem thinking design, implementing a design to fix a problem or to better an experience. Nike would have looked at what could be improved in a shoe, and by taking away the shoe tying task it maximizes efficiency, minimizing time. This design both solves the problem of a shoe lace coming undone, and the task of having to tie a lace in the first place. It makes micro-adjustments on the fly possible. It reduces excessive pressure caused by tight tying, as well as problems with slippage caused by loose laces. Basically, they reduce distraction, allowing athletes to focus on the game or competition.

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