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THE POLE WHO INVENTED A NEW METHOD OF WEAVING, BULLET-RESISTANT VEST AND...TV

POLAK, KTÓRY WYNALAZŁ NOWY SPOSÓB TKANIA,
KAMIZELKĘ KUŁOODPORNĄ I... TELEWIZOR

Summary: Jan Szczepanik, Polish inventor was called, inter alia, "Polish Edison", and "Austrian Edison". At the breakdown of the 19th century, Mark Twain described his activity in two papers. Jan Szczepanik was the author of at least 50 inventions and several hundred technical patents in the field of coloured photography, weaving or television.

Keywords: Jan Szczepanik, coloured photography, weaving, television, photometer, colorimeter

Streszczenie: Jan Szczepanik – polski wynalazca, nazywany m. in. „polskim Edisonem”, „austriackim Edisonem”. Na przełomie XIX i XX w. Mark Twain opisał jego działalność w dwóch artykułach. Jan Szczepanik był autorem co najmniej 50 wynalazków i kilkuset opatentowanych pomysłów technicznych z dziedziny fotografii barwnej, tkactwa czy telewizji.

Słowa kluczowe: Jan Szczepanik, fotografia barwna, tkactwo, telewizja, fotometr, kolorymetr

The beginning of the era of inventions – without the Poles. Luckily, not for long

Fig. 1. Jan Szczepanik [6]

At the middle of the 19th century, when the fundamental discoveries and inventories, determining the shape of the today civilization were generated, the young and clever Poles had the only one aim: independence of the Fatherland. Therefore, the names of the young Americans, Englishmen, Germans or French people were memorized in outstanding scientific publications or in the patent offices where the names of their Polish contemporaries could be found on the plates, marking the insurrectionary graves.

Fortunately, the mentioned striving at giving the life for the struggle for independence was somewhat decreased at the breakdown of the 19th century; the other aim appeared, including also striving at betterment of scientific and technical creativeness. It was followed by quick successes. In **1883**, Karol Olszewski and Zygmunt Wróblewski as the first in the world liquefied oxygen and nitrogen; Albert Einstein utilized the achievements of Marian Smoluchowski as the basis of his work; the inventory of Julian Ochrowicz saved Eiffel Tower.... the examples may be multiplied. However, **Jan Szczepanik** was undoubtedly the most fertile **inventor** of the discussed period.



Polish Edison

His contemporaries were so much enchanted in his innovative technical solutions that American journalist (and writer) Mark Twain called him Edison. It was the highest compliment as this

Fig. 1. Excerpt from the article "The Austrian Edison Keeping School Again" Mark Twain's article about Jan Szczepanik [6]

THE AUSTRIAN EDISON KEEPING SCHOOL AGAIN.

BY MARK TWAIN.

BY a paragraph in the "Freie Presse" it appears that Jan Szczepanik, the youthful inventor of the "teleelectroscope" [for seeing at great distances] and some other scientific marvels, has been having an odd adventure, by help of the state.

Vienna is hospitably ready to smile whenever there is an opportunity, and this seems to be a fair one. Three or four years ago, when Szczepanik was nineteen or twenty years old, he was a schoolmaster in a Moravian village, on a salary of—I forget the amount, but no matter; there was not enough of it to remember. His head was full of inventions, and in his odd hours he began to plan them out. He soon perfected an ingenious invention for applying photography to pattern-designing as used in the textile industries, whereby he proposed to reduce the customary outlay of time, labor, and money

expended on that department of loom-work to next to nothing. He wanted to carry his project to Vienna and market it, and as he could not get leave of absence, he made his trip without leave. This lost him his place, but did not gain him his market. When his money ran out he went back home, and was presently reinstated. By and by he deserted once more, and went to Vienna, and this time he made some friends who assisted him, and his invention was sold to England and Germany for a great sum. During the past three years he has been experimenting and investigating in velvety comfort. His most picturesque achievement is his teleelectroscope, a device which a number of able men—including Mr. Edison, I think—had already tried their hands at, with prospects of eventual success. A Frenchman came near to solving the difficult and intricate problem

genial American inventor has more than one thousand patents on his account, so he enjoyed a merited fame. In truth, when writing about Jan Szczepanik, Mark Twain called him **Austrian Edison** because he met him in Vienna and the subtleties concerning Austria and Poland (under partition) were not understandable for the American mind. Therefore, the paper written by Twain and published in the monthly *"The Century Illustrated Magazine"* (August 1898, New York) had the title *"The Austrian Edison Keeping School Again"*. Later on, Mark Twain wrote once again (in superlatives!) about the method of a distance transmitting of images, that is, precursor of television, invented by Szczepanik; it was found in the futuristic story *"From London to Times 1904"*, published in November 1898. Let's pay attention to the fact that M. Twain tried to anticipate how the world would look like after passing the border of the 19th century. And the inventions of Szczepanik played quite significant role in his vision.

From rural school to the elite of the inventors

Szczepanik was, of course, a native Pole. He was born in Rudniki (Mościska powiat), he grew up in Krosno, he commenced gymnasium in Jasło and finished in Cracow; he studied in "Teacher Seminar", also in Cracow. Later on, he was a teacher in schools of the Krosno province and he could live there until the end of his life as a rural teacher.

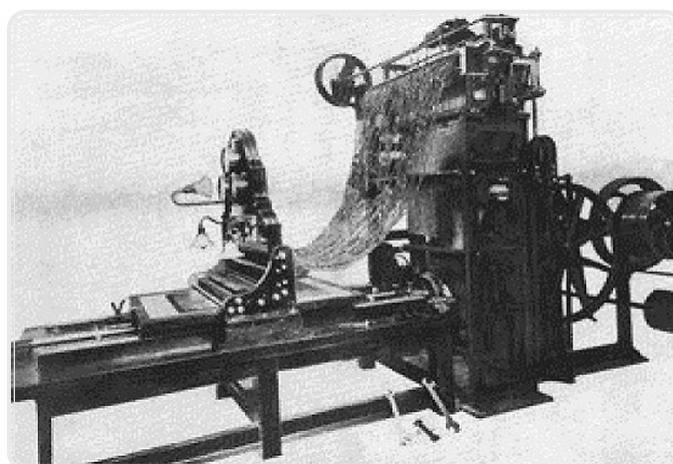
However, when having a talent and temperament of inventor, Szczepanik interrupted his career as a rural teacher and came back (in **1896**) to Cracow. He was interested in combination of photography (which was taking then the first steps) and coloured weaving, so he worked simultaneously at the shop of the Weavers' Association and in a photographic shop of Ludwik Kleinberg. The mentioned two ideas were developing in

parallel in the mind of Szczepanik although they were mutually strengthening and supplementing.

Photography and weaving

When working at Kleinberg shop, Szczepanik improved the existing pioneer methods of coloured photography. The success came later. He performed the photos on black-white film (as only such existed at that time) but he employed coloured filters (red, green and blue). The discussed achievement brought the results later and they were real, meaningful successes. In **1899**, he developed a system of miniature coloured film on which he obtained British patent in **1900**. He invented also a technique of obtaining a coloured photographic paper; he produced it and sold under his own name.

Fig. 3. The world's first automatic weaving machine - the invention of Jan Szczepanik [7]



On the other hand, the success connected with weaving came earlier. As early as in **1896** (the year of arriving to Cracow), Szczepanik created a prototype of weaving machine, producing patterned wall-hanging carpets on the basis of photography. It is worthy to remind that the coloured patterned fabrics were already mechanically produced (earlier, it was a manual work of weaver) using the so-called Jacquard looms (weaving machine), invented by Joseph Maria Jacquard. In the mentioned machines, the process of weaving was mechanically controlled by a program in a form of perforated cards. The cards had to be produced manually by the workers and often the mistakes had place. Szczepanik developed the method for automatic punching the cards on the grounds of photography of the designed pattern of fabric; he constructed also the electric system for reading of the mentioned cards and controlling the work of the weaving machine. The inventory was enthusiastically approved and as early as in 1896, Szczepanik obtained the Austrian, German and English patent and later on, the American patent for his inventory.

Vienna career

His employer Kleinberg appreciated highly talents of Szczepanik and enabled him visit to Vienna in 1898. It was a very good decision. Cracow was a provincial city of Austrian-Hungarian monarchy whereas in the capital city, it was possible to arrange advantageous contacts and develop the innovative ideas. Kleinberg established a special Society in Vienna, with the name „*Societe des Inventions Jan Szczepanik et Compagnie*” which took case of propagation and promotion of the inventories of Szczepanik. As a result of such activities of the mentioned Society and the support of business, there were established the factories of wall-hanging carpets, situated in Brussels, Roubaix and in Wuppertal and employing the weaving machines, invented by Szczepanik. Finally they were also erected in Cracow. It happened that the inventory of Jan Szczepanik found the way to its “birth” place, although by the roundabout way!

Fig. 4. Jan Szczepanik at the factory in Barmen [10]



Szczepanik knew how to care of his business. In 1898, there was a jubilee of the 50th anniversary of reigning by Emperor Franz Joseph, so Szczepanik designed and performed (in 4 copies) a wall carpet, representing the Ruler. He entitled it “Apotheosis” and offered to the Emperor. In effect, his wall carpets began to be fashionable among the Vienna aristocracy and Szczepanik became famous and rich. Mark Twain – who met the inventor in Vienna in 1898 and wrote the mentioned above publications about Szczepanik – received also a gift from the artist in a form of the writer’s woven portrait.

Underestimated idea of television

When he had learned the transmission of the image between the photography and weaving machine, Szczepanik got an idea to transmit the images at a distance for the people, i.e. he discovered the principle of television.

As early as in **1897**, he obtained the British patent (no 5031) for “telectroscope, that is, a device for reproduction of images at a distance, using electricity”. The first public transmission of the image at the distance occurred in Vienna in 1896 and the object, the image of which was to be transmitted, was the Saint Charles Borromeo Vienna Church. The journalists who observed the transmission few streets away, were impressed by the discussed event although many people had doubts whether it was a real image transmitted at the distance. In effect, the show of telectroscope didn’t cause such impression in Vienna as it should do.

Fig. 5. Excerpt from the article Dr. Johannes Horowitz about Jan Szczepanik, “That New Telectroscope”, *The New York Times*, 3 April 1898 [8]



Nevertheless, the mentioned inventory was widely (and positively!) commented abroad, *inter alia*, in the USA, in the articles of the mentioned above Mark Twain. On April, 3, 1898, it was also found on a title page of "New York Times" journal. In 1900, Szczepanik submitted his inventory (in the improved version, called "telephoto") at the World Expo in Paris and he gained a quite great recognition. As a result, he was very near to obtaining a historic fame as inventor of television but his restless spirit directed him into completely different field.

Bullet-proof butler and Spanish nobility

The inventory of bullet-proof vest brought the international fame to Szczepanik. As we know – he was an expert in weaving – so in **1901**, he developed such structure made from multi-layer fabric which was able to take over the energy of the bullet and protected completely human body, hidden under the mentioned material. The first tests of the vest were carried out in 1901, at the yard of the Szczepanik study, situated at the Pragerstasse in Vienna. The available photography on the Internet page shows the moment when the testing expert (Director Borzykowski) shot – from the distance of 3 steps – from the 7 mm-calibre revolver, to a servant of Szczepanik, dressed in the described vest. Of course, the servant came out unharmed. The journalists wrote at length about "bullet-resistant" butler with admiration.

As early as one year after introducing the Szczepanik's fabric to the market, in 1902, it became so famous after the event of saving the life of Spanish King Alfonso XIII. Szczepanik became awarded with the Order of Catholic Isabel and Spanish nobleman dignity.

Fig. 6. The world's first bulletproof vest during tests (1901) - director of the Viennese workshop of J. Szczepanik - Mr. Borzykowski shoots the servant Jan (7 mm revolver, distance 3 steps) [9]

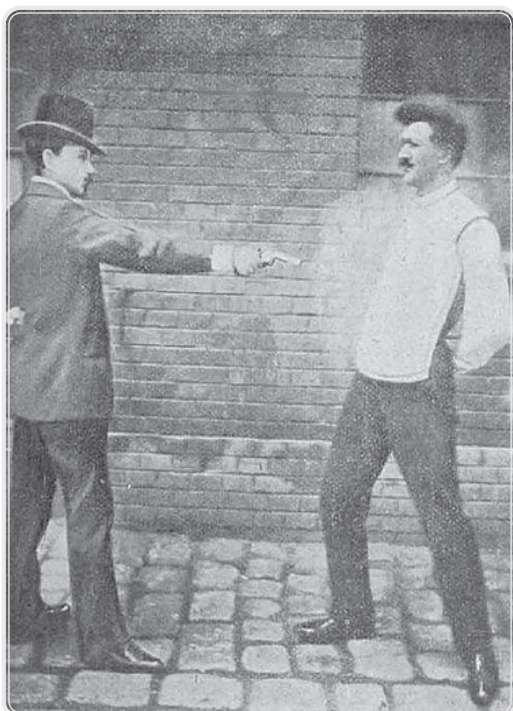


Fig. 7. A demonstration of the properties of the bulletproof vest during the First Polish Photographic Exhibition in Krakow in 1902. Eng. L. Sippel, captain Urbanski shoots. Photo from the magazine: "Ilustracya Polska" [10]



Due to the same reason, the tsar Nicolas II of Russia wanted to distinguish him with the Saint Anna Order but Szczepanik refused to receive the distinction from the aggressor, so the tsar gave him only a golden watch with diamonds and added also the broche with four diamonds and two sapphires for the fiancé of the inventor (he was only 30 years old at that time).

Coloured photography, coloured sound film and a lot of other patents

Szczepanik was the owner of ca. 100 patents in total. As it was mentioned above, he invented, *inter alia*, the methods of coloured photography (**1899**) and light-sensitive coloured paper which was produced by Swiss company J.K. Smith (since **1905**) but was also sold by Szczepanik i.e. by the company, containing his name in the name of the firm. He constructed the first camera

Fig. 8. Jan Szczepanik and his negative camera [7]

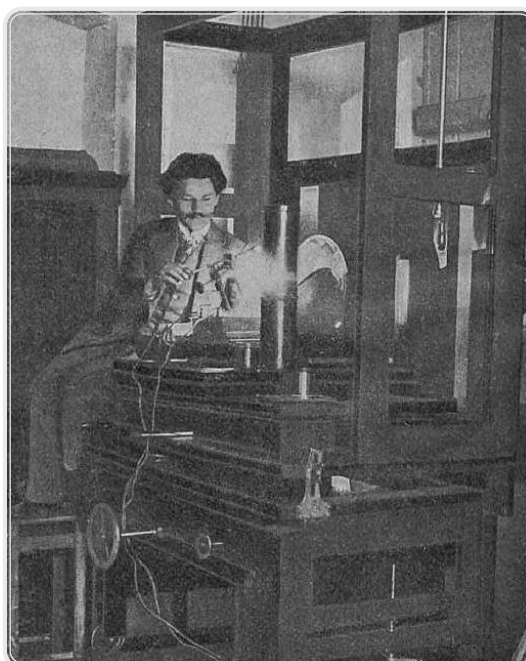


Fig. 9. The first model of Szczepanik's camera [13]

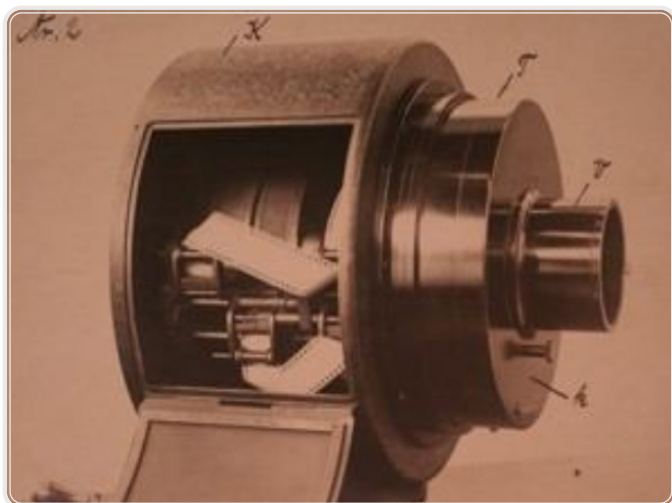
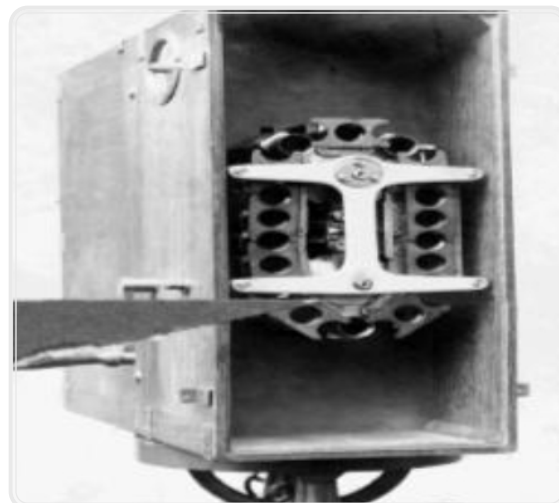


Fig. 10. The second model of Szczepanik's camera [7]



for producing the coloured films (1915) and projector adapted to displaying of such films. He alone produced also few coloured films; he should mention here "A Mountain Pass" (1921), made in the Alps; it was very highly appreciated. He produced also a scientific film, recording the course of surgical operation in the hospital Lagnebeck-Virchow in 1925. Szczepanik was also the owner of the inventory connected with recording of sound on a film tape, using cathode rays and its reproduction with the use of photocell. His patent application was submitted on 25.02.1914 but the First World War was commenced and the patent was granted as late as in June, 15, 1920. Nevertheless, the system by Szczepanik has significantly contributed to creation and development of sound film.

He developed the appropriate equipment for the photography and film making purposes; it included *inter alia*, a **photometer** for measurement of light intensity and a **colorimeter** for measurement of intensity of the particular colours.

It was not all. In 1902, Szczepanik constructed electric automatic gun, and in 1903 he introduced some improvement to the first radio equipment ("telegraph without wire"). The inventor worked also on the electronic devices for strengthening of sounds and the equipment which was called by him "photo sculptor" – it was used for photographic recording of three-dimensional objects, that is, it played then such role as to-day 3D scanners.

It is worthy, therefore, remembering "Polish Edison".

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