DZIV

Croatian Inventors through History

Hrvatski izumitelji kroz povijest

Izložba
«Hrvatski izumitelji kroz povijest»
U povodu obilježavanja 110 godina zakona o patentu u Hrvatskoj
Pod pokroviteljstvom Vlade Republike Hrvatske

Postavljena u Hrvatskom državnom arhivu u Zagrebu

Organizator i nakladnik
Državni zavod za intelektualno vlasništvo Republike Hrvatske

Za nakladnika
Željko Topić

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Vera Puhlovski
Darinka Vedrina
Rene Kajp
Vladimir Ilić
Martina Bogović

U postavljanju izložbe pomogli su
Austrijski patentni ured
Gradski muzej Križevci
HEP distribucija DP Elektra Bjelovar
Hrvatski državni arhiv, Zagreb
HT muzej, Zagreb
Mađarski patentni ured
Muzej Hvarske baštine, Hvar
Muzej policije u osnivanju, Zagreb
Tehnički muzej, Zagreb

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Ksenija Ehrenfreund

Tehnički urednik
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Grafička priprema i tisak kataloga
Gipa-Art, Zagreb

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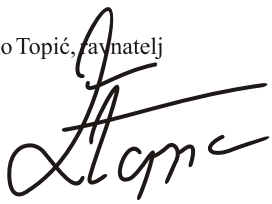
Njihova djela i izumi su bezvremeni, čine temelj suvremene znanosti i tehnologije i dio su svakodnevnog života suvremenog društva.
Sve njih od zaborava čuvaju njihova djela.
Ova publikacija je pokušaj da se ne zaborave ni njihova imena.

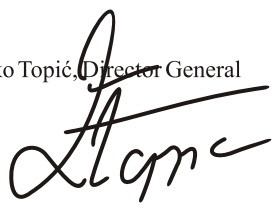
Željko Topić, ravnatelj

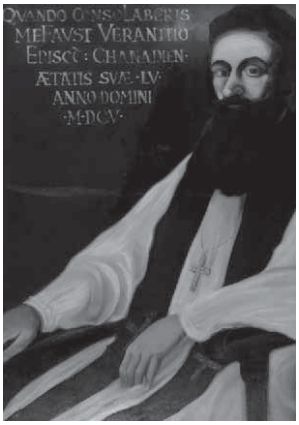


Dear Madam/Sir,

The following pages contain a representative sample of a group of enthusiasts and visionaries/inventors forming part of the Croatian heritage.
Some of these great people were born in Croatia, and some of them accepted it as their home with all their hearts.
Their works and inventions are timeless, and the basis of modern science and technology, being parts of everyday lives in modern society.
Their works keep them all from oblivion.
This publication is an effort not to let their names to be forgotten.

Željko Topić, Director General

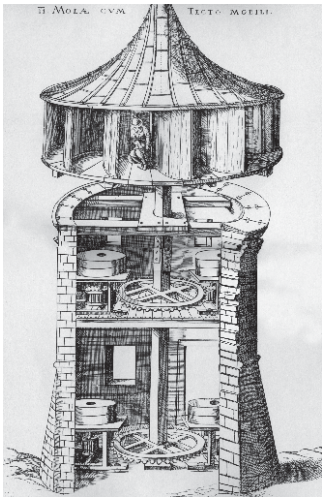


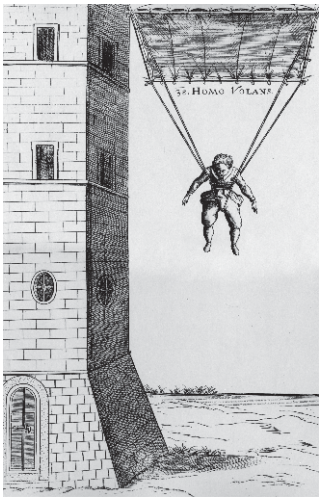


Faust Vrančić se rodio 1551.godine u Šibeniku. Jedan je od prvih naših izumitelja. Školovao se u Padovi i Veneciji, gdje je studirao filozofiju, matematiku i fiziku.
U tadašnjoj habsburškoj carevini obavljao je različite dužnosti, a dio života proveo je na dvoru kralja Rudolfa II u Pragu. Upravo tada u krugu najvećih učenjaka svoga vremena započeo je Vrančićev interes za tehniku. 1598. godine Vrančić je imenovan za biskupa od Czanada u Mađarskoj, a 1608. godine se odrekao biskupske časti.
Njegovo zanimanje za tehnička područja nastavilo se dolaskom u Rim 1609. godine, gdje se upoznao s crtežima izuma Leonarda da Vincia.
Svoje kapitalno djelo Machinae Novae (Novi strojevi), objavio je u Firenzi 1595. godine.
Vrančić je bio filozof, svećenik, političar, lingvist, književnik, znanstvenik i izumitelj. Bio je čovjek svog vremena, koji je svojim radom osobito na području tehnike bio daleko ispred vremena u kojem je živio. Iako je Vrančić veći dio života proveo u stranim zemljama, nije zaboravio "naš jazik" i svoje porijeklo.
Faust Vrančić je umro 1617. godine u Veneciji, a po vlastitoj želji sahranjen je u Prvić Luci na otoku Prviću, kraj Šibenika.

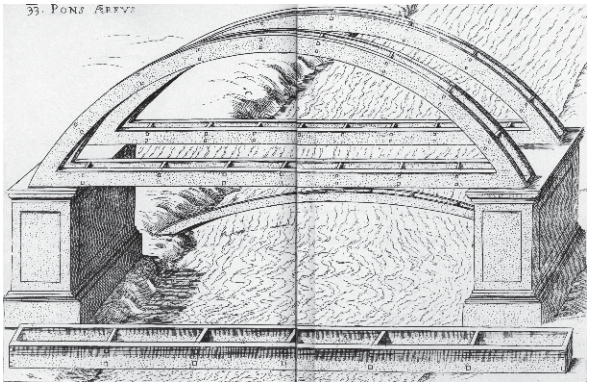
FAUST VRANČIĆ

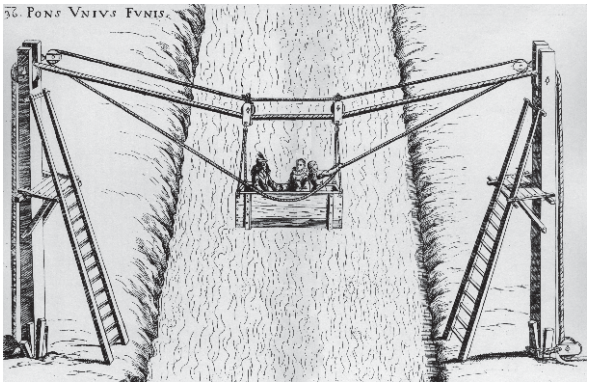
Faust Vrančić was born in 1551 in Šibenik. He is one of our first inventors. He attended schools in Padova and Venice, where he studied philosophy, mathematics and physics.
In the then Habsburg Monarchy he performed various duties, spending a part of his life on the court of King Rudolf II in Prague. That was the time when Vrančić, surrounded by the greatest scientists of his time got interested in engineering. In 1598 he was appointed to the office of bishop of Czanad in Hungary, and in 1608 he abdicated this honor.
His interest in technical fields continued with his arrival to Rome in 1609, where he discovered Leonnardo da Vinci's rough sketches of inventions. His capital work “Machinae novae” was published in Florence in 1595.
Vrančić was a philosopher, a priest, a politician, a linguist, a writer, a scientist and an inventor. He was a man of his time, whom his work, in particular in the field of engineering put far ahead of the time in which he lived.
Although Vrančić spent the greatest part of his life in foreign countries, he didn't forget “our language” and the country he decended from.
Faust Vrančić died in 1617 in Venice, but was buried in Prvić luka on the island of Prvić, near Šibenik, at his own will.



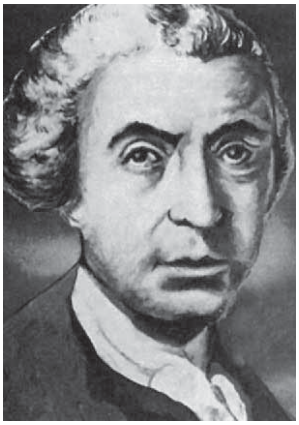


Faust Vrančić je bio jedan od najvećih umova svoga vremena. Odličnog obrazovanja i raznolikih interesa objavio je mnoga djela. Jedno od najvažnijih među njima *je Dictionarium quinque nobilisimarum Europea linguarum, Latinae, Italicae, Germanicae, Dalmaticae et Ungaricae*, koji je objavio 1595.godine u Veneciji. Taj petojezični rječnik bio je prvi hrvatski rječnik i prvi veći mađarski rječnik.
U Rimu je 1606. godine objavio djelo *Život nikoliko izabranih divic*, koje je napisao na hrvatskom jeziku.
Djela *Logica nova* i *Ethica christiana* koja obrađuju filozofske i vjerske probleme objavio je 1616.godine u Veneciji.
Prvo izdanje svoga kapitalnog djela iz područja tehnike *Machinae novae* Faust Vrančić je objavio oko 1595. godine u Firenzi. U knjizi je na 49 bakropisa prikazano 56 različitih konstrukcija. U prvom izdanju sve konstrukcije prikazane u knjizi opisane su na latinskom i talijanskom jeziku. Drugo izdanje objavljeno 1616. bilo je petojezično.
U knjizi je opisao više konstrukcija mlinova s pogonom na vjetar. Njegova konstrukcija nazvana Mlin ovješen na stijenu, predstavlja preteću suvremene vodene turbine (Francis, 1849.). Opisao je i mogućnost iskorištavanja plime i oseke primjenom Mlina postavljenog na morskom tjesnacu. Opisao je i dao konstrukciju naprave za čišćenje morskog dna. Njegova konstrukcija Most od zvonovine predstavlja prvi razrađeni prijedlog masivnog mosta od metala, koji je ostvaren 150 godina kasnije. Vrančićev Željezni most predstavlja prvi opis i konstrukcijsko rješenje lančanog mosta (Prvi lančani most sagradio je Marc Seguin 1874.godine). Vrančićeva konstrukcija Most s jednim užetom preteča je suvremene žičare (prvu žičaru sagradio je 1861.godine V. Ducker).
Homo Volans - leteći čovjek najpoznatija je i u tehničkoj literaturi često spominjana konstrukcija Fausta Vrančića. Jasno je opisan princip i konstrukcija padobrana, a pretpostavka je i da ga je Vrančić sam iskušao, barem prema pisanju engleskog biskupa Johna Wilkinsa.





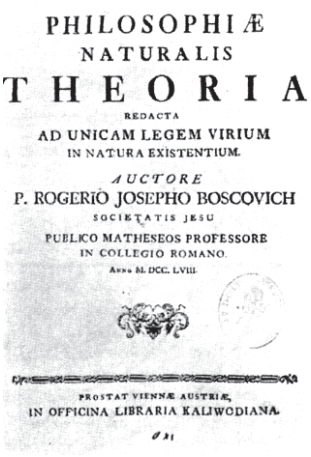
Faust Vrančić was one of the finest minds of his time. Excellently educated and having diversity of interests, he published many works.
One of his most important works is *Dictionarium quinque nobilisimarum Europea linguarum, Latinae, Italicae, Germanicae, Dalmaticae et Ungaricae,* published in 1595 in Florence. This 5-lingual dictionary was the first Croatian dictionary and the first more substantial Hungarian dictionary.
His work Život nikoliko izabranih divic, written in the Croatian language was published in Rome in 1606.
In *Logica nova* and *Ethica christiana*, published in Florence in 1616, he dealt with the philosophical and theological problems.
The first edition of his capital work *Machinae novae* was published in 1595 in Venice. The book contained 49 sketchings representing 56 different designs. In the first edition all the designs represented in the book were described in the Latin and Italian languages. The second edition, as published in 1616 was a 5-lingual edition. The book contained several designs of windmills. His design entitled A Mill Suspended on the Rock, represented a prototype of the modern water turbine (Francis, 1849). He also described a possibility of exploiting high and low tide by the application of a Mill constructed on a sea channel. He described and designed devices for cleaning sea bottom. His design of a Bridge Made of Metal used for Bells represents the first elaborated proposal of massive bridge made of metal, constructed 150 years later. The Vrančić's Metal Bridge represents the first description and design solution of a chain bridge (the first chain bridge was built by Marc Seguin in 1874). The Vrančić's design of A Bridge with One Cable is a prototype of the modern cable railway (the first cable railway was constructed in 1861 by V. Ducker).
Homo Volans a flying man is the most famous design by Faust Vrančić, frequently mentioned in literature, where a parachute principle and design was clearly described. According to the book written by John Willkins, the English bishop, Vrančić presumably tested the parachute by himself.

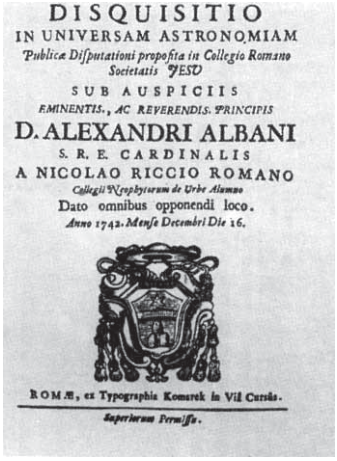


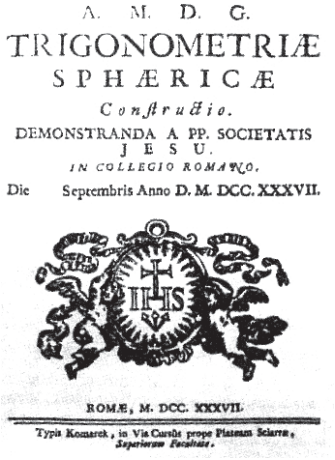
Ruđer Bošković rodio se u Dubrovniku 1711. godine. Osnovno obrazovanje stekao je u Dubrovniku. U isusovačkoj srednjoj školi Collegium Ragusinum, stekao je izvrsno znanje što je bilo presudno za njegov daljnji znanstveni rad.
Školovanje je nastavio na Collegium Romanum u Rimu. Učio je retoriku, poeziju, filozofiju, matematiku i fiziku.
1740. godine postao je rodoviti profesor matematike Rimskog kolegija.
Oko 1760. godine izabran je za člana Engleskog kraljevskog društva.
Godine 1764. postao je voditelj optike i astronomije na sveučilištu u Milanu.
U Parizu je 1774. godine bio postavljen na mjesto ravnatelja pomorske optike. Tada je u potpunosti došla do izražaja i Boškovićeva tehnička genijalnost.
Tijekom života istakao se i kao političar, izvrstan pregovarač, ali i kao pjesnik. Pjesme je pisao i na hrvatskom, kako ga je zvao, »naškem» jeziku.
Njegova povezanost s rodnim gradom, njegovom kulturom i jezikom trajala je cijelog Ruđerovog života. I njegova diplomatska aktivnost bila je upućena na dobrobit rodnoga grada.
Ruđer Bošković umro je u Milanu 1787. godine.

RUĐER BOŠKOVIĆ

Ruđer Bošković was born in Dubrovnik in 1711. He aquired his primary education in Dubrovnik, and an excellent knowledge in Collegium Ragusinum, the jesuitic secondary school, which was decisive for his future scientific work. He continued his schooling on Collegium Romanum in Rome. He studied rhetorics, poetry, pholosophy, mathematics and physics.
In 1740 he became a full professor of mathematics of the Rome Collegium.
Approximately in 1760 he was elected a member of the English Royal Society.
In 1764 he was appointed Head of Optics and Astronomy at the University in Milan.
In 1774 in Paris he was appointed to the post of Head of Maritime Optics. It was then that the Bošković's technical genious was completely revealed.
He was also known as a politician, an excellect negotiator, and a poet. He wrote his poems in the Croatian language as well, calling it «our» language.
Ties with his home town, and the culture and language thereof were solid all the Ruđer's life. His diplomatic activity was aimed at, among other things, the benefit of his home town.
Ruđer Bošković died in Milan in 1787.


PHILOSOPHIÆ
NATURALIS
THEORIA
REDACTA
AD UNICAM LEGEM VIRIUM
IN NATURA EXISTENTIUM.
AUCTORE
P. ROGERIO JOSEPHO BOSCOVICH
SOCIETATIS JESU
PUBLICO MATHESEOS PROFESSORE
IN COLLEGIO ROMANO.
Anno M. DCC. LVIII.
PROSTAT VIENNÆ AUSTRIÆ,
IN OFFICINA LIBRARIA KALIWODIANA.


DISQUISITIO
IN UNIVERSAM ASTRONOMIAM
Publicæ Disputationi proposita in Collegio Romano
Societatis JESU
SUB AUSPICIIS
EMINENTIS., AC REVERENDIS. PRINCIPIS
D. ALEXANDRI ALBANI
S. R. E. CARDINALIS
A NICOLAO RICCIO ROMANO
Collegii Neophytorum de Urbe Alumno
Dato omnibus opponendi loco.
Anno 1742. Mense Decembri Die 16.
ROMÆ, ex Typographia Komarek in Via Cursûs.
Superiorum Permissu.


A. M. D. G.
TRIGONOMETRIÆ
SPHÆRICÆ
Constructio.
DEMONSTRANDA A PP. SOCIETATIS
JESU.
IN COLLEGIO ROMANO,
Die Septembris Anno D. M. DCC. XXXVII.
ROMÆ, M. DCC. XXXVII.
Typis Komarek, in Via Cursûs prope Plateam Sciarræ,
Superiorum Facultate.

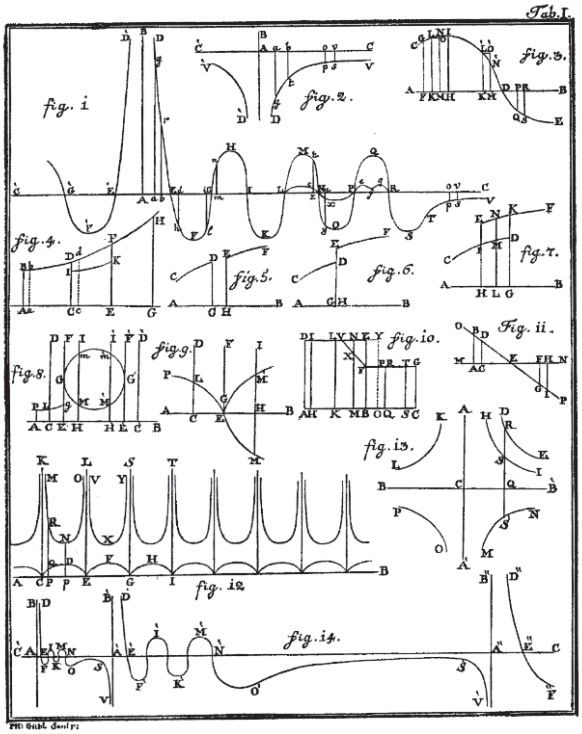
Knjigu Teorija prirodne filozofije R. Bošković je objavio 1758. godine. U knjizi je izložio svoj pogled na osnovnu strukturu tvari. To Boškovićevo poimanje građe prirode obuhvaćalo je cjelokupnu strukturu tvari: kvarkove, nukleone, atomske jezgre, atome i molekule. Boškovićeve teorije poslužile su kao poticaj i vodič mnogim poznatim znanstvenicima koji su se bavili tom problematikom.

Djelo rasprava »O sunčevim pjegama» objavljeno je 1736., a obrađivalo je temu astronomije.Godine 1748. Bošković je u Rimu objavio raspravu «O svjetlosti».

Bošković je prvenstveno bio znanstvenik, no pri rješavanju praktičnih problema dolazila je također do izražaja njegova genijalnost. Bavio se problemom leća radi poboljšanja astronomskih instrumenata. Bošković je konstruirao prvi optički mikrometar, prvi je primjenio prizmu s promjenljivim kutem, predložio je načine uklanjanja kromatizma dalekozora, koji je i ostao u trajnoj upotrebi. U Milanskom opservatoriju čuvaju se astronomski instrumenti koje je Bošković projektirao i izradio.

Bošković je 1755. godine u Rimu i 1770. godine u Parizu objavio djelo »Astronomsko i zemljopisno putovanje». Baveći se geodezijom izradio je niz posve novih instrumenata i pribora za izvođenje geodetskih mjerenja.

Boškovićev doprinos znanosti, te tehnologiji u području optike i geodezije svrstava ga u red neizostavnih, nezaboravljenih i bezvremenih znanstvenika i mislilaca.



“Malo je što znamo, neizmjerno što ne znamo.”

R. Bošković

His book “Theory of Natural Philosophy” was published in 1758. In the book he presented his view of the basic structure of a substance. This Bošković's understanding of the structure of the nature included the whole structure of substances: quarks, nucleons, atomic nuclei, atoms and moleculas. The Bošković's theories served as impetus and guide to many renowned scientists dealing with these issues. A work “Dissertation on the Sun Spots” dealing with the field of astronomy was published in 1736. “Dissertation on Light” was published in Rome in 1748. Bošković was above all a scientist, but his ingeniousness was also epressed in solving practical problems.

He dealt with the field of lenses to improve astronomic instruments. Bošković designed the first optical micrometer, he was the first to apply a prism with changeable angle, proposed the method for removing the chromatic aberration of binoculars, which remained in permanent use. The astronomic instruments designed and constructed by Bošković are kept in the Milan observatorium.

His work “Astronomic and Geographical Journey” was published in Rome in 1755, and in Paris in 1770. Dealing with the field of geodesy he constructed a range of completely new instruments and tools for geodetic measurements. Bošković's contribution to the science and technology in the field of optics and geodesy put him among unavoidable, unforgettable and timeless scientists and philosophers.

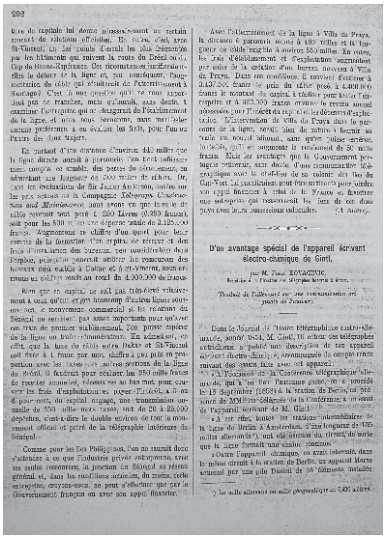
“Little is what we know, immeasurable what we do not know.”

R. Bošković

Ferdinand Kovačević rođen je 1838. godine u Gospiću. Osnovno školovanje završio je u Gospiću, te potom pohađao vojnu školu u Bečkom Novom Mjestu. Kovačević je bio aktivni topnički časnik. Vojnu karijeru završio je 1866. godine kada je postao službenik Telegrafske uprave u Josefstadtu. Godine 1869. imenovan je za podgrađovođu telegrafa u Telegrafskom inspektoratu za Hrvatsku i Slavoniju. Iako je živio u maloj tada nesamostalnoj Hrvatskoj, gdje je s obzirom na uvjete bilo teže postizati znanstvene i stručne rezultate, Kovačević se razvio u priznatog stručnjaka u području telegrafije.
Vrhunac njegovog stručnog rada bio je izum novog postupka tzv. izmjenične duplex veze, u telegrafiji.
Nadalje je Kovačević ostvario intenzivnu suradnju u stručnim časopisima raznih europskih zemalja. 1889. godine objavio je članak i knjigu o Univerzalnom releju, koji je sam konstruirao i koji je predstavljao poboljšanje u odnosu na dotadašnje.
I nakon umirovljenja Ferdinand Kovačević se nastavio baviti znanstvenim i stručnim radom na području telegrafije.
Ferdinand Kovačević je umro 1913. godine u Zagrebu.

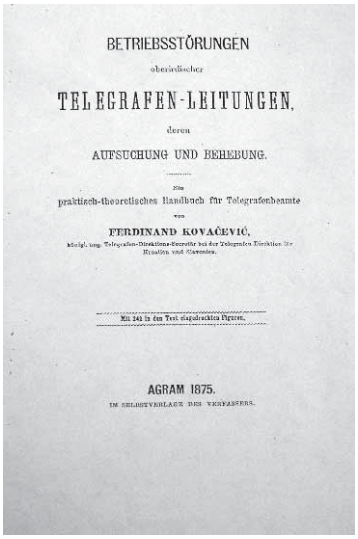
FERDINAND KOVAČEVIĆ

Ferdinand Kovačević was born in Gospić in 1838. He finished his primary schooling in Gospić, and attended the military school inWiener Neustadt. Kovačević was an active artillery officer. In 1866 he finished his military career and took a job in the Telegraphic Administration in Josefstadt. In 1869 he was appointed assistant to the Head of telegraph constructions in the Telegraph Inspectorate for Croatia and Slavonia. Although he lived in small non-independent Croatia, where scientific results were difficult to be achieved in the given situation, Kovačević developed in a recognized expert in the field of telegraphy.
The prime of his professional work was the invention of a new process introducing duplex connection in telegraphy.
Furthermore, Kovačević established intensive cooperation with professional journals of many European countries. In 1889 he published a paper and a book about universal relay, which he designed, and which represented an improvement to the then existing ones. Ferdinand Kovačević continued his engagement in the scientific and professional work even after his retirement.
He died in Zagreb in 1913.



D'un avantage spécial de l'appareil écrivant électro-chimique de Gintl,

par M. Ferd. KOVAČEVIĆ,



BETRIEBSSTÖRUNGEN

oberirdischer

TELEGRAFEN-LEITUNGEN,

deren

AUFSUCHUNG UND BEHEBUNG.

Ein

praktisch-theoretisches Handbuch für Telegrafenbeamte

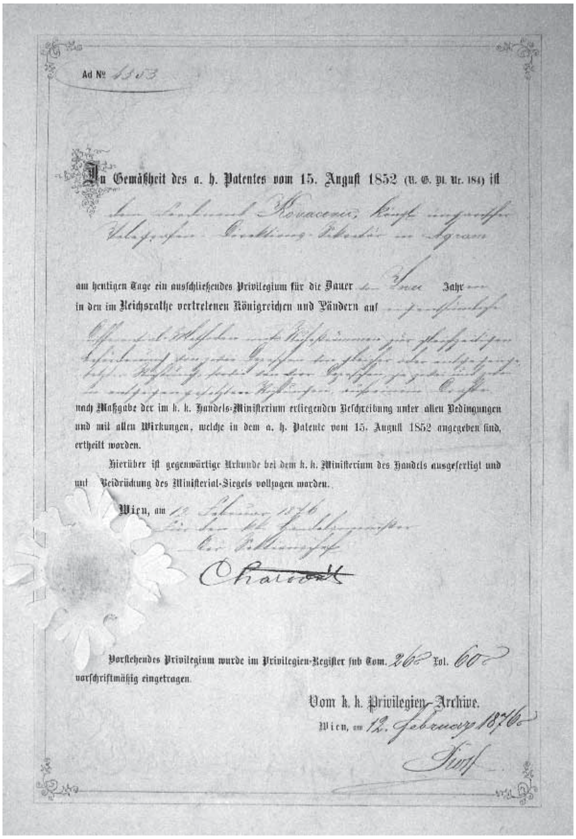
von

FERDINAND KOVAČEVIĆ,

AGRAM 1875.

IM SELBSTVERLAGE DES VERFASSERS.

Prvi stručni članak Ferdinand Kovačević je objavio 1878. godine.
Objavljivao je u praškom stručnom časopisu Technische Blatter, časopisu Revue telegraphique iz Berna, Journal telegraphique, Zeitschrift für Elektrotechnik, Elektrotechniche Zeitschrift.
Godine 1876. za izum novog postupka ostvarivanja duplex veze Ferdinandu Kovačeviću je Patentni ured u Beču i Budimpešti izdao patentnu ispravu.
To je bio prvi patent iz područja elektrotehnike i telegrafije, koji je dodijeljen hrvatskom izumitelju.
Tijekom svog života Ferdinand Kovačević je napisao 4 knjige, 8 stručnih i znanstvenih članaka.



Ad №

In Gemäßheit des a. h. Patentes vom 15. August 1852 (R. G. Bl. Nr. 184) ist

am heutigen Tage ein ausschließendes Privilegium für die Dauer Jahr in den im Reichsrathe vertretenen Königreichen und Ländern auf

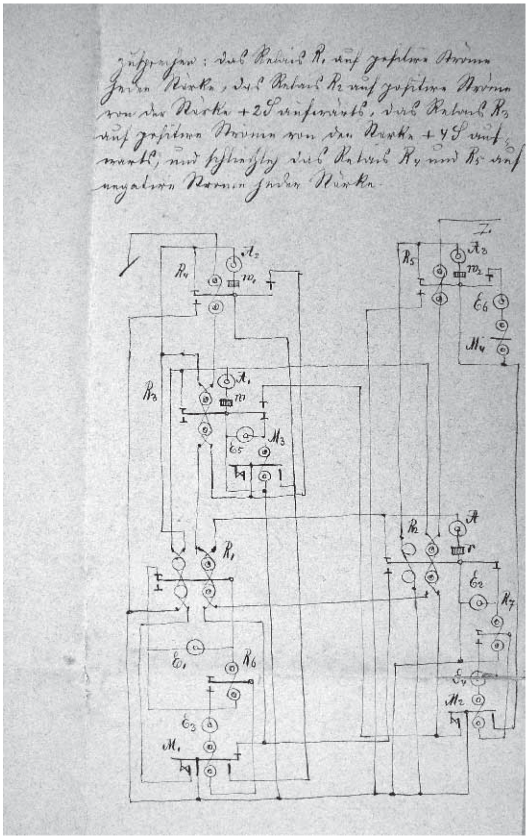
nach Maßgabe der im k. k. Handels-Ministerium erliegenden Beschreibung unter allen Bedingungen und mit allen Wirkungen, welche in dem a. h. Patente vom 15. August 1852 angegeben sind, ertheilt worden.

Hierüber ist gegenwärtige Urkunde bei dem k. k. Ministerium des Handels ausgefertigt und mit Beidrückung des Ministerial-Siegels vollzogen worden.

Wien, am 12 Februar 1876

Vorstehendes Privilegium wurde im Privilegien-Register sub Tom. 26 Fol. 60 vorschriftmäßig eingetragen.

Vom k. k. Privilegien-Archive.
Wien, am 12. Februar 1876

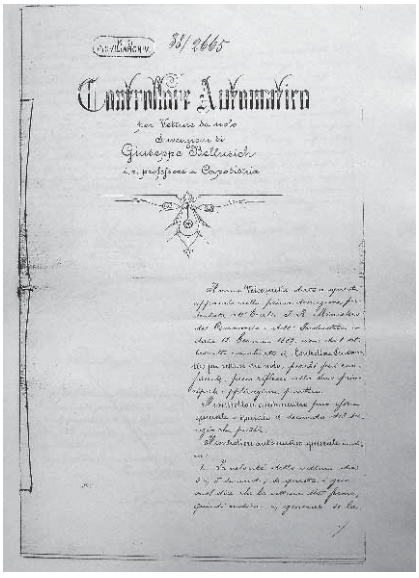


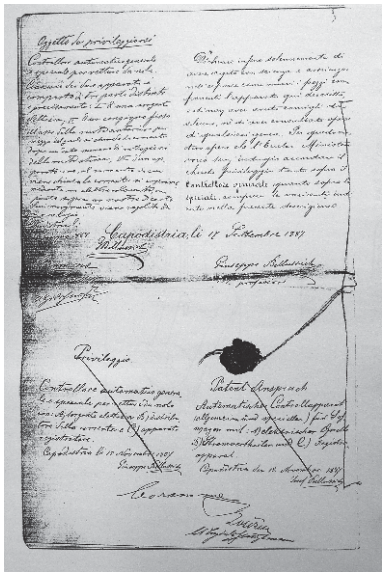
In 1878 Ferdinand Kovačević published his first paper.
He published his papers in the Technische Blatter from Prague, Revue telegraphique from Berne, Journal telegraphique, Zeitschrift fur Elektrotechnik, Elektrotechnische Zeitschrift.
In 1876 Ferdinand Kovačević was issued a Patent Certificate for a new process introducing duplex connection by the Patent Offices in Vienna and Budapest.
This was the first patent to be granted to a Croatian inventor.
Ferdinand Kovačević wrote 4 books and 8 professional and scientific papers.

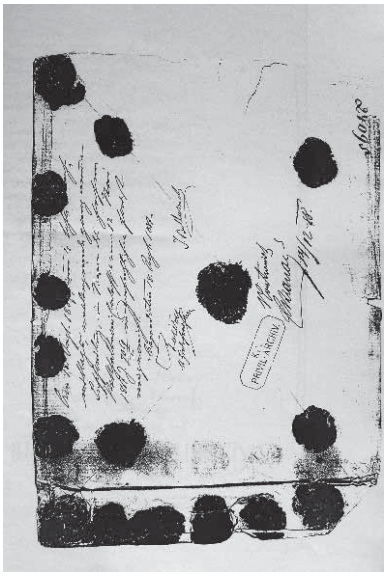
Josip Belušić rodio se 1847. u selu Županići kraj Labina. Kao bistrog dječaka otac ga je dao na školovanje u Pazin, kod svećenika.
Nakon završetka talijansko-austrijske gimnazije, školovanje je nastavio u Beču. Nakon studija 1875. godine zaposlio se u Carskoj i kraljevskoj učiteljskoj školi u Kopru.
Godine 1889. na Svjetskoj izložbi u Parizu na kojoj je postavljen Eiffelov toranj, predstavio je svoj izum koji je nazvao velocimetar.
Od 1900. godine živio je u Trstu i bavio se proizvodnjom velocimetra.

JOSIP BELUŠIĆ

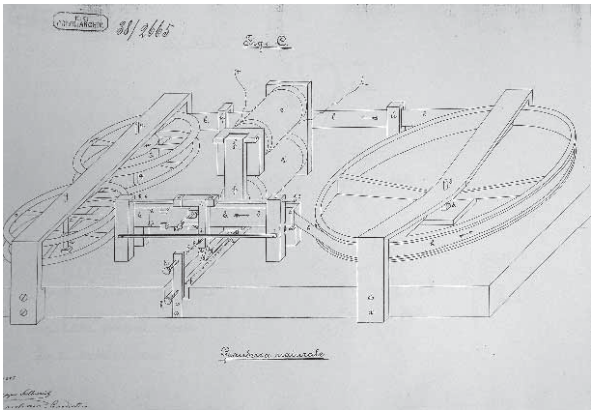
Josip Belušić was born in Županići, a village near Labin in 1848. As a clever boy he was sent to school to Pazin to be a priest.
After finishing the Italian and Austrian grammar school, he moved to Vienna to continue his schooling. In 1875, after having finished his studies, he got a job in the Royal Teacher-Training School in Kopar.
In 1889, at the World Exhibition in Paris, witnessing the building of the Eiffel Tower, he presented his invention under the name of velocimeter.

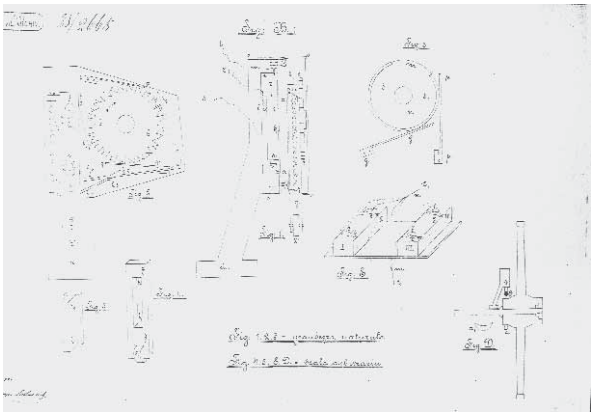


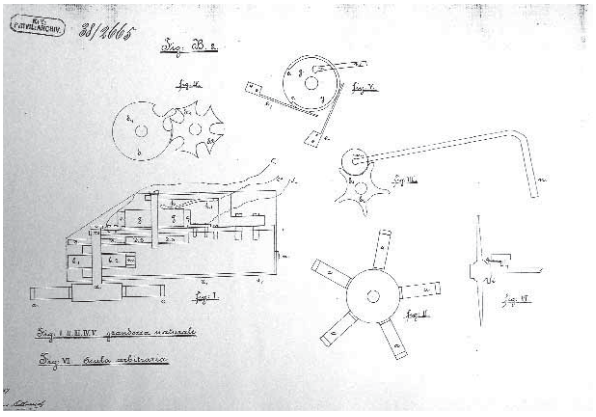


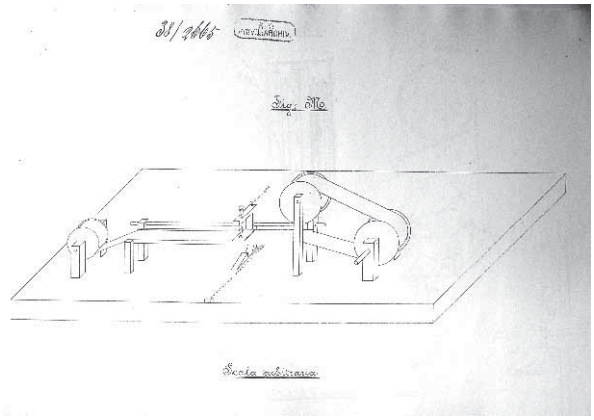


Inovacija prof. Belušića iz Županića prvotno nazvana velocimetar (brzinomjer) izazvala je na Svjetskoj izložbi u Parizu iznimnu pozornost. Velocimetar je od 1891. godine službeno bio primjenjivan na pariškim fijakerima.
Velocimetar Ivana Belušića mjerio je brzinu, stajanje kola, vremenska trajanja vožnje i stajanja, broj osoba koje su se prevozile, te vrijeme ulaska i izlaska putnika. Uređaj je bio i tahograf i taksimetar.
Poznavatelji tahografa i taksimetra, aparata koji se danas koriste pri regulaciji u prometu uvidjet će da je Belušićev izum ostao gotovo neizmijenjen do današnjih dana.







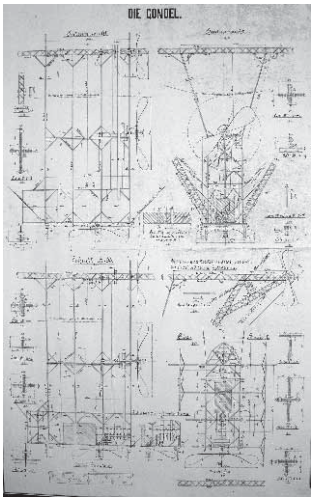


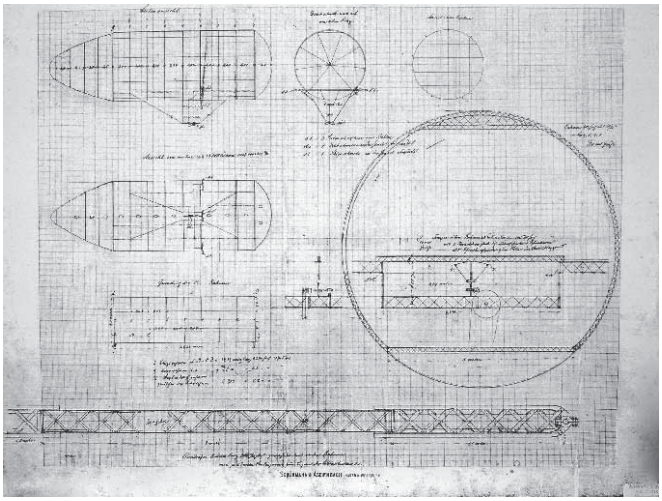
The innovation introduced by Professor Belušić from Županići under the name of velocimeter attracted great attention at the World Exposition in Paris. From 1891 the velocimeter was officially applied in hackney coaches in Paris.
The Ivan Belušić's velocimeter measured the speed of a coach, its stopping, duration of the ride and of standing still, the number of the persons taking a ride and the time when they entered the coach and step off it. This device comprised a tachograph and a taximeter.
Professionals operating with tachograph and taximeter devices used in the traffic regulation today will see that the Belušić's invention remained almost unmodified up to the present day.

David Schwartz rodio se 1852. godine u Keszthely u Mađarskoj. U svojoj trinaestoj godini doselio je u Županju. U Županji je učio trgovački obrt i nakon završetka školovanja počeo se baviti trgovinom građevnim drvom, a ubrzo je imao i vlastitu pilanu.
Od mladosti se zanimao za strojarstvo, a osobito za aerotehniku. Nakon što mu je u požaru uništena pilana, a on zadobio teške opekline, Schwartz se preselio u Zagreb i u potpunosti posvetio ostvarenju svoga sna o izgradnji upravljivog zračnog broda. Predvidio je da njegov zračni brod ima oblik valjka nešto suženog na prednjoj strani. Protivno tadašnjim mišljenjima da zračni brodovi trebaju biti obloženi platnom, odlučio je svoj brod obložiti aluminijem. U Njemačkoj, radeći s tvorničarom Karlom Bergom proizveo je novu aluminijsku leguru nazvanu dural (Schwartzov aluminij).
Godine 1890. David Schwartz je u Zagrebu završio nacrte upravljivog zračnog broda.
Nakon dugogodišnje potrage za investitorom Schwartz je 1985. u Berlinu, uz pomoć K. Berga ugovorio suradnju za izgradnju svog zračnog broda.
Krajem 1896. brod je bio završen. Scwartz je sam iznad radionice u Tempelhofu načinio prvu i to uspješnu pokusnu vožnju, dokazavši da se njegovom letjelicom može upravljati.
Neposredno prije zakazane službene pokusne vožnje zrakoplova 1897.godine Schwartz je u Beču umro od posljedica moždanog udara.

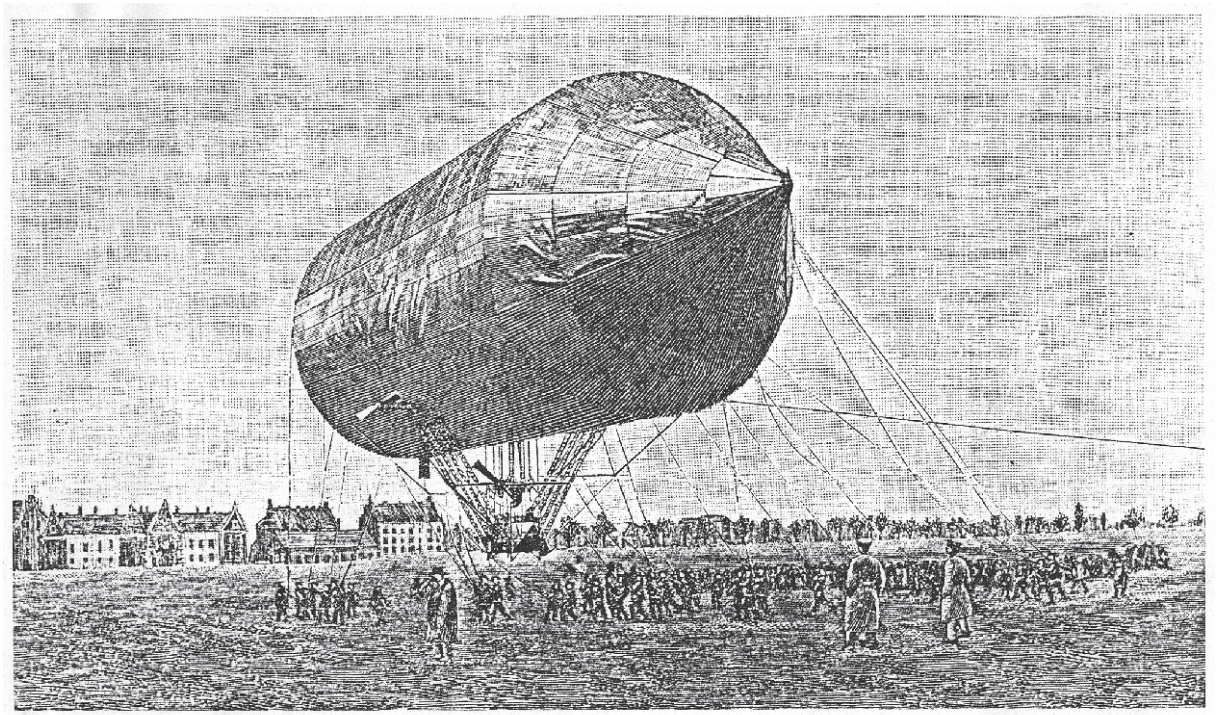
DAVID SCHWARTZ

David Schwartz was born in Keszthely, Hungary in 1852. When he was thirteen he moved to Županja. In Županja he attended school for commercial crafts. After finishing school he engaged in wood trade and soon after he had his own saw-mill.
As a young man he was interested in mechanical engineering, and in particular aeronautical engineering. After having lost his saw-mill in fire, and after being severely burned, Schwartz moved to Zagreb and dedicate himself completely to the realization of his dream of building a controllable air ship. He imagined his air ship in the form of a cylinder slightly narrower in the front. Contrary to the opinion of that time that air ships should be made of linen, he decided to make it of aluminium. Working in Germany with Karl Berg he made a new aluminium alloy called dural (Schwartz aluminium).
David Schwartz completed a design of a controllable air ship in Zagreb, in 1890. After a long-term search for investor, Schwartz, assisted by K. Berg, negotiated cooperation concerning the construction of his air ship.
The ship was completed by the end of 1896. Schwartz himself made the first and successful trial flight over the workshop in Tempelhof, showing that his air ship is controllable.
Schwartz died of brain stroke in Vienna in 1897, just before the planned official trial flight took place.



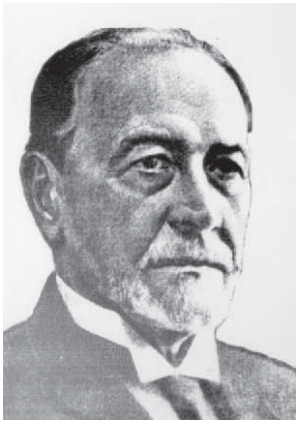


Međutim, tu priči nije kraj.
Pokusna vožnja je ipak obavljena, zahvaljujući Schwartzovoj udovici Melanie. Događaj ipak nije prošao najuspješnije. Zbog neiskustva pilota zrakoplov se nakon dobrog početnog leta srušio na uzletištu u Tempelhofu i bio je znatno oštećen.
Okolnosti su uvjetovale da se nakon Schwartzove smrti crteža «domogao» grof Zeppelin i 1900. godine ih gotovo potpuno neizmjenjene upotrijebio za izgradnju broda pod svojim imenom.
Tako je izum samoukog vizionara aerotehnike, nečasno postao poznat pod tuđim imenom.
Danas vrlo mali broj ljudi zna tko je pravi izumitelj prvog upravljivog zračnog broda i da je ono što nam je danas poznato kao zeppelin ustvari-SCHWARTZOPLAN.
Osnovne karakteristike Schwartzoplana bile su da je bio valjkastog oblika, obložen duraluminijem koji je Schwartz prvi proizveo i prvi upotrijebio, a koji se zavarivao specijalnim postupkom koji je izumio sam Schwartz.
Brod je sadržavao valjkasti prostor ispunjen plinom, čistim vodikom. U gondoli koja je bila obješena na metalni rub valjka nalazio se pogonski motor. Bio je to benzinski motor od 16 KS.



Der Schwarz'sche Aluminiumballon vor seiner ersten Auffahrt am 3. November 1897 auf dem Tempelhofer Feld. Der Lenkballon ist 38 m lang, hat 12 m Durchmesser und gleicht einem riesigen Geschoß

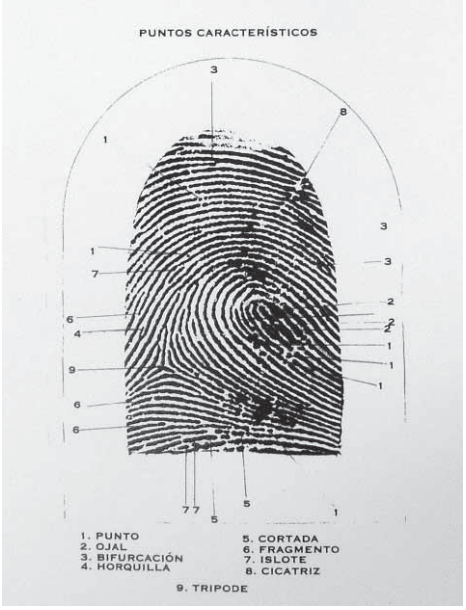
However, this is not the end of the tale.
The trial flight took place thanks to the Schwartz's widow Melanie but was not successful. Due to the pilot's inexperience the air ship eventually fell down to the airfield in Tempelhof and was substantially damaged. Under certain circumstances count Zeppelin managed to get Schwartz's drawings soon after his death, and used them to build the ship under his name in 1900.
Thus the invention, created by a self-thought visionary of aeronautical engineering, became known under somebody else's name.
Today, only a few people know who is the true inventor of the first controllable air ship and that the Zeppelin is in fact the SCHWARZPLAIN.
The main characteristics of Schwarzplain are that it had a cylinder form, that it was made of dural, first manufactured and used by Schwartz, and that it was welded according to a special process invented by Schwarz.
The ship contained a cylinder formed space filled with pure hydrogen. The engine was in a gondola suspended on metal edge of the cylinder. It was a 16 horsepower gas engine.

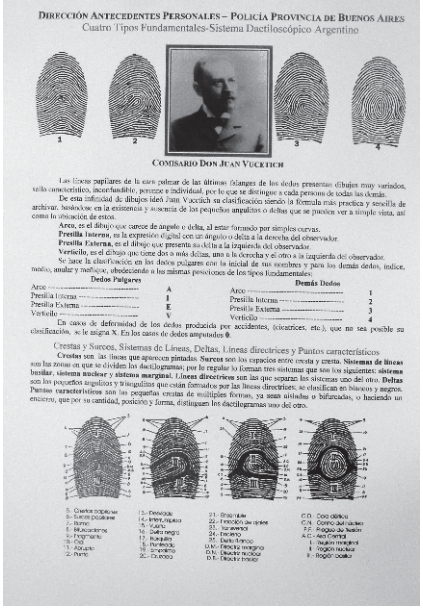


Ivan Vučetić rodio se 1858. godine na Hvaru. Redovitu pučku školu završio je u Hvaru. Nakon toga izučio je bačvarski zanat. Za bačvarstvo nije pokazivao osobito zanimanje, pa su ga na školovanje dali uglednom franjevcu Marojeviću.
Stekao je odličnu humanističku naobrazbu i već u mladosti je dobro vladao talijanskim jezikom. Nakon toga Ivan Vučetić je služio vojsku u austrougarskoj pješadiji. Bio je izvrstan glazbenik i svirao je u hvarskoj glazbi, te se bavio i skladanjem. Nakon povratka na Hvar zaputio se u Argentinu kamo je stigao 1884. godine.
Godine 1888. zaposlio se u Centralnom uredu policije u La Plati. 1889. godine postao je šef Odjela za statistiku. Godine 1891. šef policije povjerio mu je da organizira «Službu identifikacije». Neprekidno radeći i usavršavajući se, Vučetić je ubrzo stvorio sistem klasifikacije otisaka prstiju koji je nazvao iknofalangometrija.
Izradio je i ormar za registraciju, kartoteku i ostale sprave za praktičnu primjenu svog sistema.
Godine 1891. započinje radom «Služba identifikacije» u La Plati, uzimanjem otisaka prstiju, a iste godine Vrhovni sud u Buenos Airesu priznaje službene rezultate ostvarene Vučetićevom metodom.
Prvi puta u povijesti kriminalistike 1892. godine, rješen je vrlo složen zločin i počinitelj otkriven pomoću otisaka prstiju (slučaj Rojas).
Godine 1903. daktiloskopija je kao sistem identifikacije priznata i u Engleskoj.

IVAN VUČETIĆ

Svoje kapitalno djelo «Dactiloscopia comparada» (Usporedna daktiloskopija), u kojem je obradio novi daktiloskopski sistem, Ivan Vučetić je objavio 1904. godine. Vučetić je ustanovio i novo zvanje u policiji «vještak-identifikator».
Do kraja svog života Vučetić je napisao mnoga djela o daktiloskopiji, sudjelovao u mnogim polemikama, neosporno dokazujući originalnost svoje metode. Proputovao je cijeli svijet, a osobiti uspjeh i najširu primjenu Vučetićev izum je imao u Kini i Japanu.
Hvar je posjetio 1913. godine tijekom svoje svjetske turneje.
Vučetić je umro 1925. godine.
Iako se tijekom vremena sistem klasifikacije otisaka prstiju modificirao i dopunjavao, bez sumnje je Ivan Vučetić stvorio prve temelje suvremene, znanstvene i praktične primjene daktiloskopije.





Ivan Vučetić was born in Hvar in 1858 where he completed elementary education. Afterwards he was trained for cooper's trade, but he did not have much interests for it. His education continued with the respectable Franciscan Marojević.
He acquired a splendid liberal arts education and in his young age had a good knowledge of the Italian language. Subsequently Ivan Vučetić completed his military service with the Austro-Hungarian infantry. He was excellent musician and played in the ensemble of Hvar besides that he composed music.
Following his return to Hvar he departed to Argentina where he arrived in 1884.
In the year 1888 he was employed in the Central Police Office in La Plata and in 1889 became head to Department of Statistics. In 1891, head of the police confered on him the organisation of "Identification Service".
Continually working and improving his knowledge, Vučetić soon created a classification system of fingerprints he named *icnophalangometry*.
He made a box file, a card file and other devices for the application of his system in practice.
In 1891 "Identification Service" in La Plata started to work by taking fingerprints, and in the same year the Supreme Court of Justice in Buenos Aires accknolwedged the official results obtained by the Vučetić's method.
In 1892, for the first time in the history of crime investigation, a very complicated crime was solved, and the committer was detected by fingerprinting (Rojas case).
In1903 a *dactyloscopy* was likewise acknowledged in England as the system of identification.
His masterwork "Dactiloscopia comparada" (Comparative Dactyloscopy) in which he elaborated a new system of dactyloscopy was published in 1904 Vučetić established a new police profession "expert-identifier" as well.
During his life Vučetić wrote many books on dactyloscopy, participated in many polemics, indisputably proving the originality of his method. He travelled around the whole world, a special success and fullest application Vučetić's invention accomplished in China and Japan.
In 1913 he paid a visit to Hvar during his world tour.
Ivan Vučetić died in 1925.
Although the system of classification of fingerprints was modified and completed with the years, Ivan Vučetić is beyond any doubt the creator of the first modern basis for scientific and practical application of dactyloscopy.

Biblija, Job, 37. 7
“Svakom čovjeku zapečati ruke da svi njegovo upoznaju djelo.”

Eduard Penkala rodio se 1871 u slovačkom gradu Lipovsky Sv. Mikulaš (Austro-ugarska monarhija). Od djetinjstva je kod njega bila izražena sklonost tehnici. Školovao se u rodnom gradu i Bielitzu. Započeo je studij medicine u Beču, koji prekida, te odlazi u Dresden gdje je na Kraljevskoj tehničkoj školi 1898. diplomirao kemiju. Neko vrijeme radio je u kemijskoj industriji u Košicama.

Godine 1900. Eduard Penkala seli s obitelji u Zagreb. U Zagrebu je od 1904. godine bio kraljevski tehnički nadzornik (današnji rang ministra) za cijelo istočno područje Austro-ugarske monarhije. Eduard Penkala bio je u ovom razdoblju jedan od najpopularnijih građana grada Zagreba. Prihvativši Zagreb kao svoj dom i zavoljevši Hrvatsku, Eduard je svom imenu dodao i ime Slavoljub.

Penkala je stvorio i patentirao preko osamdeset izuma iz različitih područja ljudske djelatnosti i različitih tehničkih područja.

Godine 1906. Penkala je izumio možda svoj najpoznatiji izum, automatsku mehaničku olovku. Iste godine u tvrtki Moster & Co. počeo je proizvoditi mehaničku olovku.

Osnovao je vlastiti laboratorij Elevator u kojem se neumorno bavio istraživanjem.

Penkalina zadivljenost letenjem i neumoran rad na konstruiranju aviona, rezultirali su izgradnjom hangara i prvog uzletišta u Zagrebu. Godine 1910. Penkalin avion uspješno je dovršen, a Penkala je poletio u vlastitom avionu sa uzletišta na Črnomercu.

Eduard Slavoljub Penkala bio je europski putnik, i svojim znanjem koristio se da doprinese općoj dobrobiti. Umro je iznenada 1922. godine, u Zagrebu, u najvećem stvaralačkom naponu.

EDUARD SLAVOLJUB PENKALA

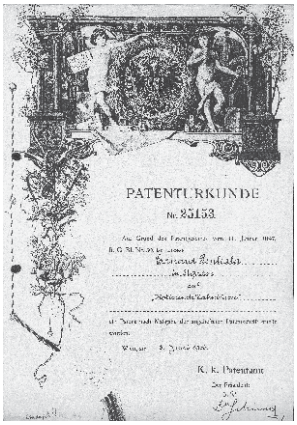
Eduard Penkala was born in the Slovak town of Liptovsky SV Mikulaš (Austro-Hungarian Monarchy). Since his childhood he was inclined to technical fields. He attended school in his home town and in Bielitz. He began to study medicine in Vienna, but left it, and moved to Dresden, where he graduated in chemistry at the Royal Technical School in 1898. For some time he worked in chemical industry in Košice.

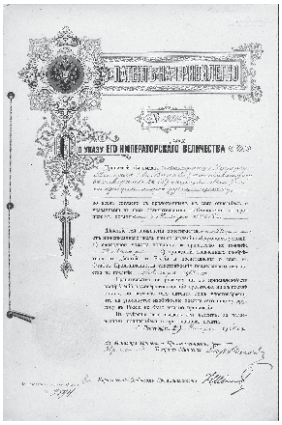
In 1900 Eduard Penkala moved with his family to Zagreb. Since 1904 Penkala was a royal technical superintendent (as the today's minister) for the whole Eastern territory of the Austro-Hungarian Monarchy. At that time, Penkala was one of the most popular citizens of Zagreb. Accepting Zagreb as his home town and coming to like Croatia, Eduard added «Slavoljub» to his name.

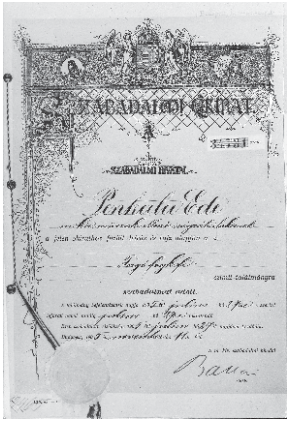
Penkala created and was granted over 80 inventions covering various fields of human activity and various technical fields.

In 1906 Penkala invented automatic mechanical pencil, possibly his most important invention. In the same year he began to manufacture the mechanical pencil in Moster & Co. He founded Elevator, his own laboratory in which he restlessly conducted researches. Penkala's admiration for flying, and his restless work in designing airplanes resulted in the construction of a hangar and an airfield in Zagreb. In 1910 Penkala's airplane was successfully completed, and Penkala took off his own plane from the airfield in Črnomerec.

Eduard Slavoljub Penkala travelled a lot around Europe, using his knowledge to contribute to the general welfare. He died suddenly in Zagreb, in1922 in his creational prime.

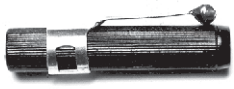


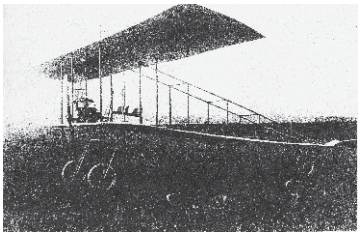




Penkala

Penkala je bio jedan od najvećih svjetskih izumitelja. Njegovi široki interesi koji su sezali u sva polja ljudske djelatnosti rezultirali su s 80-tak patenata i izuma iz različitih područja. Prvi Penkalin izum bila je mehanička četkica za zube1905.godine. Slijedi njegov možda najpoznatiji izum Automatska mehanička olovka iz1906. Ovaj izum proizvodio se u tvornici Moster & Co.u kojoj je Penkala bio partner. Tako je «penkala» bila dostupna na europskom i svjetskom tržištu. U tvornici su se također prema Penkalinim izumima proizvodila i nalivpera, olovke, sušila za tintu, tinte, produživači za olovke.
U svom laboratoriju Elevator otkrio je prvi efikasni detergent za rublje, plavilo za izbjeljivanje rublja, djelotvorni insekticid (Krepax), lijek za liječenje reume (Radium D), tekući preparat ksilalit za impregniranje željezničkih pragova.
Penkala je izumio i prvi termofor, termos-bocu, manometar, dinamometar, nalivpero, knipse, kočnicu za vagone, sastav tračnica, uređaj za mjerenje protoka tekućina. Penkala je načinio i proračunao nacrte turbinskih kola i propelera za pokretanje helikoptera.
Napravio je i prve nacrte lebdjelice, a patentom je 1909. zaštitio uređaje za uzgon i napredovanje u zraku i na vodi, te uređaj za podizanje u zrak.
Pronašao je i usavršio novu masu-ebonit, od koje su se pod etiketom Edison-Bell-Penkala proizvodile gramofonske ploče. Nastojao je usavršiti i poboljšati snimanje i reprodukciju zvuka na gramofonskim pločama. Usavršio je gramofonsku iglu, te mikrofon na gramofonu. Izumio je patentirao i proizvodio i jednu vrstu gramofona. Prislušne uređaje Penkala koristila je Austro-ugarska vojska za vrijeme I. svjetskog rata.
Godine 1909. patentirao je avion na principu zmaja i avionska noseća krila.
1910. godine završio je konstrukciju i poletio vlastitim avionom.



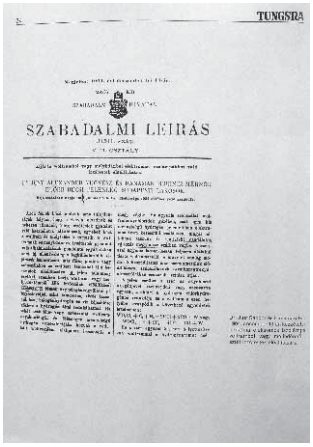


Penkala was one of the greatest world inventors. His great interest in all the fields of human activity resulted in some 80 patents and inventions covering various fields. The first Penkala's invention was a mechanical toothbrush, invented in 1905. Automatic mechanical pencil, possibly his most famous invention was created in 1906. This invention was manufactured in the Moster & Co. factory, under the Penkala's partnership. Thus “penkala” became available on the European and world market. The factory also manufactured fountain pens, pencils, ink dryers, inks, and pencil extenders.
In his Elevator laboratory he invented the first effective laundry detergent, laundry blueing, effective insecticide (Krepax), a medicine for rheumatism (Radium D), a liquid preparation ksilalit for impregnation for railway sleepers. Penkala also invented the first hot water bottle, a manometer, a dynamometer, a fountain pen, a rail-car brake, a rail system, and a liquid flow measuring device. Penkala designed turbine wheels and propellers for helicopters. He made first sketches of a hovercraft, and was granted patents for buoyancy and lifting devices.
He invented and improved a new mass the so called ebonite used in the manufacture of records under the label of Edison-Bell-Penkala. He tried to improve and optimize recording and reproduction of the record sound. He improved the phonograph needle and microphone. He invented, patented and manufactured a type of the phonograph. The Austro-Hungarian Army used Penkala's bugging devices during the First World War. In 1909 he was granted a patent for an airplane using the principle of hang-gliding and airplane structure wings.
In 1910 he completed the construction of and flew in his own airplane.

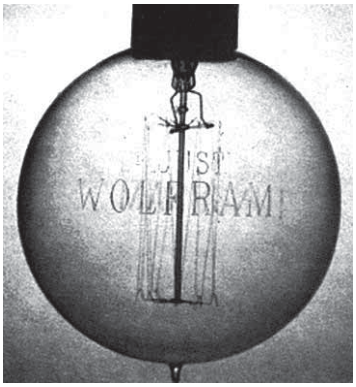
Franjo Hanaman rodio se 1878. godine u Drenovcima, kraj Županje. Nakon preseljenja u Brčko i završetka pučke škole, Hanaman, kojeg su od ranog djetinjstva privlačile tehničke i prirodne znanosti, upisao je 1890. Realnu gimnaziju u Zemunu.
Tijekom školovanja kod Hanamana se razvio poseban interes za kemiju. U Beču je studirao kemiju na Tehničkoj visokoj školi (Technische Hochschule) i diplomirao na Kemijskom odjelu.
Nakon završetka studija i kratkotrajnog rada u šećerani u Usori, početkom 1900. god.Hanaman se vratio u Beč, gdje je vodio elektroanalitički laboratorij, što ga je potaklo na bavljenje elektrotehnikom. Upoznavši dr. Aleksandra Justa započeo je s njim raditi na postupku pronalaženja postupaka za dobivanje žarnih niti.
Godine 1903. Hanaman i Just patentom su zaštitili način proizvodnje volframove niti supstitucijom.
Godine 1913. Hanaman je u Berlinu promoviran za doktora znanosti. Nakon završetka I. svjetskog rata nastanio se u Zagrebu, a 1920. izabran je za docenta Kemijske tehnologije na Visokoj školi u Zagrebu.
Godine 1921. imenovan je za redovitog profesora Anorganske kemijske tehnologije. Godine 1922. izabran je za dekana kemičko inženjerskog odjela, Visoke tehničke škole u Zagrebu. 1924. godine izabran je za Rektora Visoke tehničke škole.
Bio je osnivač Odsjeka za rudarstvo i metalurgiju na Tehničkom fakultetu Sveučilišta u Zagrebu.
Franjo Hanaman umro je u Zagrebu 1941. godine.

FRANJO HANAMAN

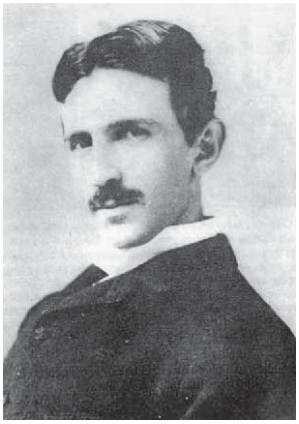
Franjo Hanaman was born in Drenovci near Županja in 1878. After having moved to Brčko and finishing primary school, Hanaman who was attracted by natural sciences, enrolled in the secondary grammar school in Zemun in 1890. During his schooling, Hanaman developed a special interest in chemistry. He studied chemistry at High Technical School (Technische Hochschule) in Vienna and got his degree at the Department for Chemistry.
After having finished his studies and following his short-term work at sugar refinery in Usora, Hanaman returned to Vienna in 1900. There he ran electro analytic laboratory, which encouraged him to engage in the electro engineering. After having met Dr. Alexander Just, he started to work with him on a research relating to a process for obtaining filaments.
In 1903 Hanaman and Just were granted a patent for the method of manufacture of wolfram filaments by substitution.
Hanaman got a PHD degree in Berlin in 1913. After the First World War he moved to Zagreb, where he was appointed assistant professor in chemical technology at High School in Zagreb in 1920.
In 1921 he was appointed full professor of inorganic chemical technology at High School in Zagreb. In 1922 he was appointed Dean of the Chemical Engineering Department at High Technical School in Zagreb. In 1924 he was appointed Rector of High Technical School.
He founded the Mining and Metallurgy Department at the Faculty of Engineering of the University of Zagreb.
Franjo Hanaman died in Zagreb in 1941.



Hanaman je prvi rad na području elektroanalize publicirao 1902. godine.
Na katedri Analitičke kemije na Visokoj tehničkoj školi u Beču, upoznao je Alexandera Justa koji je radio na usavršavanju žarulje s ugljenom niti. Od tada se Hanaman posvetio pronalaženju postupaka za dobivanje žarnih niti.
Godine 1903. Hanaman i Just patentom su zaštitili način proizvodnje volframove niti supstitucijom. Nakon ovoga Hanaman i Just dobili su još nekoliko patenata koji opisuju način izrade volframove niti drugim postupcima.
Godine 1905. godine Hanaman i Just zaposlili su se u tvrtki Egyesült Izzólámpa es Villamossági Rt. u Budimpešti, koja se bavila proizvodnjom žarulja. Tvrtka je otkupila njihov patent i 1906. započela s proizvodnjom žarulja s volframovom niti.
Hanamanov i Justov patent bio je registriran u trinaest zemalja širom svijeta.
Uvidjevši da ne može držati korak s američkom tvrtkom General Electric Co., Hanaman im je 1910. godine, u ime Mađarske tvrtke, prodao svoja patentna prava.
Hanamanovi i Justovi izumi načina dobivanja volframovih žarnih niti bili su temelj na kojem je nastala moderna i ekonomična električna rasvjeta.



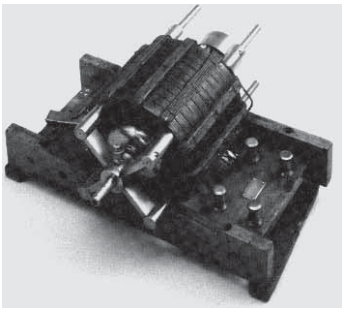
In 1902 Hanaman published his first paper in the field of electro analysis.
He met Alexander Just at High Technical School, Department of Analytical Chemistry in Vienna. Alexander Just worked on the improvement of an electric bulb with carbon filaments. Since then, Hanaman dedicated his research to a procedure for obtaining filaments.
In 1903 Hanaman and Just were granted a patent for the method of manufacturing wolfram filaments by other processes.
In 1905 Hanaman and Just take a job at Egyesült Izzólámpa es Villamossági Rt in Budapest, which manufactured electric bulbs. The company bought off their patent rights and launched a production of electric bulbs with wolfram filaments.
Hanaman's and Just's patents were registered in 13 countries all over the world.
In 1910, noticing that he could not take pace with the American General Electric Co., Hanaman sold it his patent rights on behalf of the Hungarian company.
Hanamans' and Justs' inventions relating to the method of obtaining wolfram filaments are the basis for modern and cost effective electric lighting.

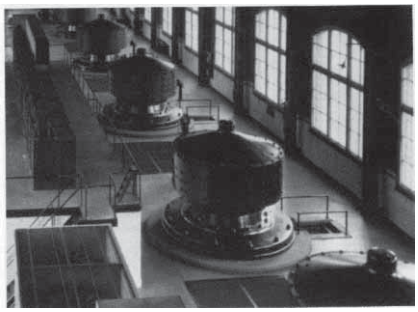


Nikola Tesla rođen je 1856. godine u Smiljanu kraj Gospića. Od malena je učio napamet važne fraze i izreke i napamet izračunavao složene zadatke. U Smiljanu je Tesla započeo školovanje u pučkoj školi, ali i počeo razvijati svoj interes prema tehnici. Nakon preseljenja s obitelji, školovanje je nastavio u Gospiću. Tamo je stekao dobro znanje iz prirodoslovnih predmeta i dobro je naučio njemački jezik.
Školovanje je 1870. nastavio u Rakovici kraj Karlovca u Kraljevskoj višoj realnoj gimnaziji. U tom razdoblju života neprekidno je razmišljao o nekim izumima i izrađivao modele vodenih strojeva - turbina.
Godine 1875. Tesla se upisao na Visoku tehničku školu (Technische Hochschule) u Grazu. Tijekom školovanja bavio se problematikom rješavanja konstrukcije električnog stroja. Razočaran neuspjehom izgubio je stipendiju i 1879. na trećoj godini studija prekinuo je školovanje.
S namjerom da završi studij Tesla je 1880. godine otišao u Prag. Godine 1881. otišao je u Budimpeštu i zaposlio se u Telegrafskom uredu. Tu je započeo svoju aktivnost na području elektrotehnike i ostvario nekoliko izuma za pojačavanje glasa u telefoniji.
Nastavio se baviti problematikom motora izmjenične struje.1882. godine napokon je riješio problem konstrukcije motora s okretnim magnetskim poljem. Da bi ostvario svoj izum odlazi u Pariz, ali tamo za to nisu imali interesa. 1883. godine konstruirao je u mehaničkoj radionici svoj indukcioni motor.
Nikola Tesla je 1884. godine otišao u SAD, i tamo se zaposlio u "Edison Company".
Ubrzo je osnovao "Tesla Light Company" u kojoj je želio razviti svoje motore. Međutim, na početku se bavio proizvodnjom lučnih električnih svjetiljki. Razvio je sustav lučne svjetiljke za istosmjernu struju i patentirao ga1886. godine.
"Tesla Electric Company" Tesla je osnovao 1887. godine. Uredio je radionicu i laboratorij predviđen za njegove pokuse.

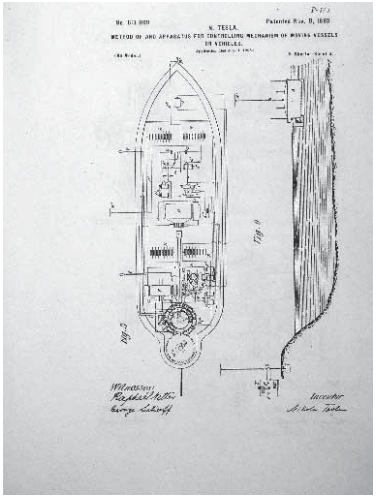
NIKOLA TESLA

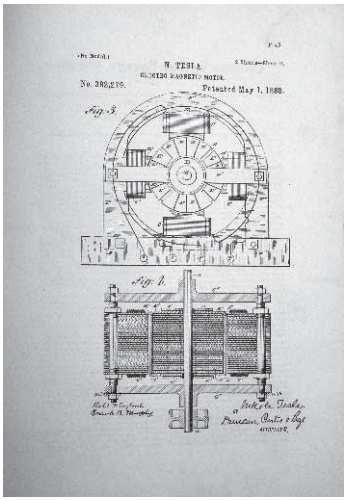
Od listopada do prosinca 1887. godine Tesla je patentirao asinkroni motor, električni prijenos energije, indukcioni motor s kratkospojenim rotorom i motor s kontaktnim prstenom, te sustav razdiobe električne energije (transformator za polifazne struje).
Na ovim patentima zasniva se suvremena elektrotehnika u području jake struje.
U brzom nizu Tesla je 1888. godine prijavio patente za električni prijenos s tri žice, za dvofazne i trofazne struje, serijski spoj i jednopolni pretvarač za istosmjerne i višefazne izmjenične struje, zakretni transformator za regulaciju brzine vrtnje indukcionih motora, te za asinkrone generatore i višepolne strojeve.
U vremenu od 1888. do 1891. godine Tesla je prijavio 35 različitih patenata za jednofazne i višefazne motore.
U svibnju 1888. Tesla je sklopio ugovor s tvrtkom "Westinghouse Electric and Manufacturing Company", na temelju kojeg su svi njegovi izumi na području višefaznih struja došli u vlasništvo te kompanije. Prvi agregat hidroelektrane kod slapova Niagare pušten je u pogon 1895. godine, a elektrana je potpuno završena 1896. godine. Gotovo u isto vrijeme kada i njemački fizičar Wilhelm Conrad Röntgen Tesla je izvodio pokuse s X-zrakama. Izradio je i upute za rad s X-zrakama. Godine 1898. Tesla je prijavio patent uređaja za daljinsko upravljanje brodovima i vozilima, a sam uređaj prikazao je u Madison Square Gardenu. Na poticaj Nikole Tesle izgrađen je visokonaponski laboratorij u Colorado Springsu. Laboratorij je završen 1899. godine i Tesla je u njemu planirao vršiti pokuse bežičnih veza i proučavati munje.
Nikola Tesla je u području električnih motora i generatora patentirao 36 izuma, u području transformacije električne energije 9 izuma, u području rasvjete 6 izuma, u području visokofrekvencijskih aparata i regulatora 17 izuma, u području radija 12 izuma, u područja telemehanike 1 izum, u području turbina i sličnih uređaja 7 izuma i još 11 izuma s različitih područja. Ukupno 99 patenata za izume iz različitih područja tehnike. Prvi je ukazao na mogućnost elektroterapije, te na mogućnost bežičnog prijenosa informacija i energije. Genijalnost njegova uma i njegovih tehničkih rješenja potvrđuju i činjenice da neka od njih, ni do danas, nisu u potpunosti znanstveno (teorijski i/ili eksperimentalno) verificirana. Kao znak zahvalnosti za izuzetno značajan doprinos razvoju tehnike, a posebno elektrotehnike, mjerna jedinica za magnetsku indukciju nosi naziv prema njegovom prezimenu.
Nikola Tesla umro je 1943. godine u New Yorku.

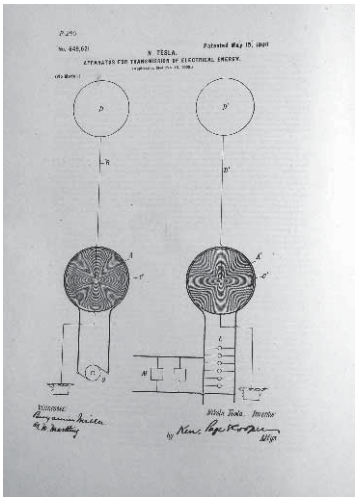




Nikola Tesla was born in Smiljan near Gospić in 1856. Since his early youth he learned important phrases, and wise sayings, and made complex calculations by heart. Tesla began his primary education in Smiljan, at the same time developing his interest in engineering. After having moved with his family to Gospić he continued his education there. There, he acquired excellent knowledge in subjects comprising natural sciences and good knowledge of the German language.
In 1970 he continued his schooling at the Royal Higher Grammar School in Rakovica near Karlovac. In those days he permanently thought of certain inventions and constructed models of water turbines.
In 1875 Tesla enrolled in the High Technical School (Technische Hochschule) in Graz. During his schooling he dealt with the design solution for an electric machine. Disappointed with his failure he lost his scholarship and left school at the third year of study.
In 1880 Tesla went to Prague intending to finish his studies. In 1881 he moved to Budapest to work in a Telegraph Office. There he began his activity in the field of electrical engineering and created several inventions relating to a voice amplifier in telephony. He continued to deal with the alternating current motor. In 1882 he finally solved the design problem of a motor using rotating magnetic field. He moved to Paris to develop his invention, but nobody was interested in it. In 1883 in a mechanical workshop he designed his induction motor.
In 1884 Tesla moved to the United States to work in the «Edison Company». He soon founded «Tesla Light Company» in which he intended to develop his motors. However, at the beginning he manufactured beacon electric lamps. He developed a system of beacon lamps for direct current and was granted a patent for it in 1886. In 1887 Tesla founded «Tesla Electric Company». He built a workshop and a laboratory for his experiments.
From October till December 1887 Tesla was granted patents for his asynchronous motor, electric transfer of energy, an induction motor with short connected rotor and a motor with contact ring, as well as a system of distribution of electric power (a power transformer for multiphase currents). Modern high voltage electric engineering is based on these patents.
In 1888 Tesla applied for patents for a three wired electric transfer, for a two- and three- phased current, series connection and one pole power transformer for direct and multiphase currents, a torque power transformer regulating rotation velocity of induction motors, for asynchronous generators and multipolar machines.
In the period from 1888 to 1891 Tesla applied for 35 various patents for single or multiphase motors.
In May 1888 Tesla concluded a contract with «Westinghouse Electric and Manufacturing Company» on the basis of which all his inventions in the field of multiphase currents became the ownership of this company. The first aggregate of a hydro-electric power plant near Niagara Falls was put into operation in 1895, and the hydro-electric power plant was completely finished in 1896. Almost parallelly with the German physicist Wilhelm Conrad Röntgen Tesla made experiments with X-rays. He also gave instructions for the work with X-rays. In 1898 Tesla applied for a patent for a device for remote control of ships and vehicles and the device was displayed at the Madison Square Garden. On Tesla's initiative a high voltage laboratory was built in Colorado Springs. The laboratory was finished in 1899. Tesla planned to make experiments with wireless connections and to study lightning.
Tesla was granted 36 patents in the field of motors and generators, 9 in the field of transformation of electric energy, 6 patents in the field of lighting, 17 patents in the field of high frequency devices and regulators, 12 patents in the field of radio, 1 patent in the field of remote control mechanical engineering, 7 patents in the field of turbines and similar devices and 11 patents covering various fields. In total 99 patents in various technical fields. He was the first to point out the possibility of electrotherapy, and the possibility of wireless transfer of information and energy. The facts that some of his technical solutions have not been scientifically (theoretically and/or experimentally) completely verified even today speak for the brilliance of his mind and of his technical solutions. As a token of appreciation for an extremely important contribution to technological development, in particular in the field of electric engineering, a unit of magnetic induction has been given his surname.
Nikola Tesla died in New York in 1943.



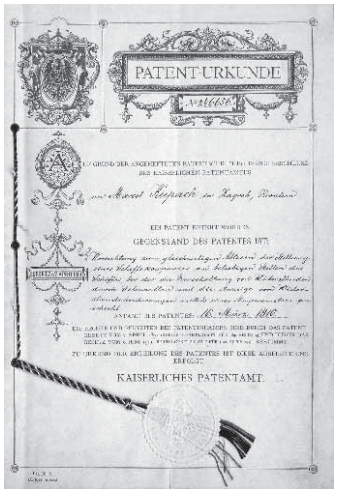


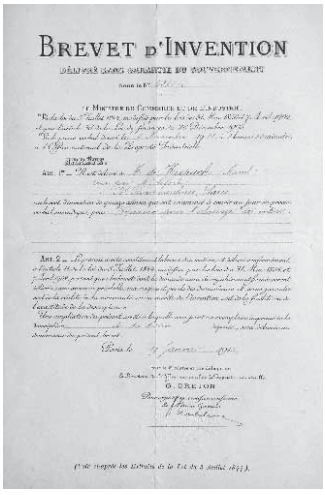


Marcel pl. Kiepach rođen je u Križevcima 1894. godine, u vlastelinskom dvoru, na obiteljskom imanju.
U dobi od 9 godina već je konstruirao različite naprave, te u jednom pismu svom ocu navodi: »Preko nedjela i četvrtke radim jednu novu mašinu koja meće slova u onaj pleh…».
U Križevcima je polazio pučku školu, a zatim je pohađao I Realnu gimnaziju u Zagrebu.
Svoj prvi izum-žirokompas Marcel je patentirao 1910. u Berlinu u dobi od 16 godina.
Nakon položenog ispita zrelosti 1914. godine roditelji su ga poslali na studij gospodarskih nauka u Halle, a zatim u Berlin.
Kiepacha privlače tehničke znanosti pa on paralelno upisuje Visoku tehničku školu u Charlottenburgu.
Kada je počeo I svjetski rat Marcel pl. Kiepach javio se u vojsku kao jednogodišnji dobrovoljac.
Kao austrougarski vojnik poslan je na ruski front u Poljsku, gdje je 1915. godine poginuo.

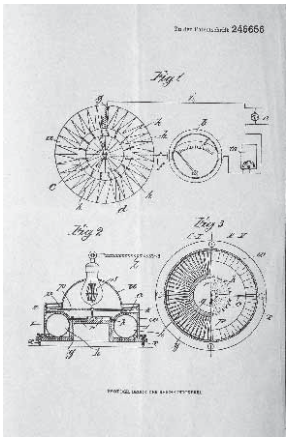
MARCEL PL. KIEPACH

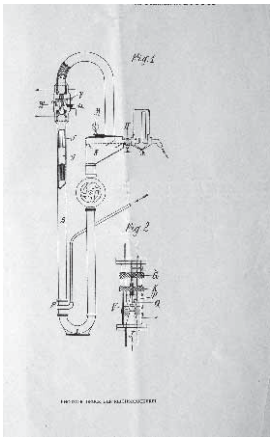
Marcel Kiepach, Esq. was born in Križevci, in the family estate, in 1894.
At the age of 9 he already constructed various devices, and in a letter to his father he wrote: »Sundays and Thursdays I am working on a new engine for putting letters in a tin plate».
He attended elementary school in Križevci and Ist Secondary School in Zagreb. His first invention, a gyrocompass Kiepach, Esg. patented at the age of 16 in Berlin in 1910.
On graduation from secondary school in 1914, his parents sent him to Halle and subsequently to Berlin to study economic sciences.
Kiepach was attracted by technical sciences and at the same time he attended the High Technical College in Charlottenburg.
At the beginning of the World War I, Marcel Kiepach, Esq. enlisted for the voluntary military service for a year. He was sent as an Austro-Hungarian soldier to the Russian front in Poland, where he was killed in 1915.

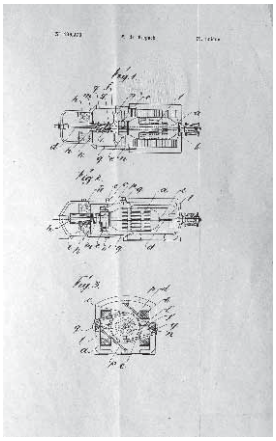


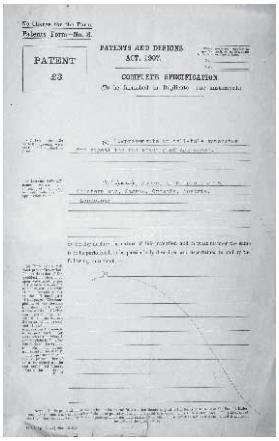


Prvi svoj izum žiro-kompas Kiepach je patentirao 1910. godine u Berlinu.
To je uređaj za istodobno pokazivanje položaja brodskog kompasa na raznim mjestima broda.
Isti izum patentirao je 1911. godine u Londonu.
Godine 1912. u Parizu je patentirao dinamo stroj za rasvjetu svih vrsta kola. Taj izum je bio predviđen za rasvjetljavanje kočija, omnibusa i željezničkih vagona, a temeljio se na principu električnog generatora tjeranog takvim vozilom.
1912. godine prijavio je u Berlinu u Carskom patentnom uredu konstrukciju za strujni prekidač za röntgenske aparate.
U suradnji s Heinrichom Weilandom prijavio je Carskom patentnom uredu u Berlinu izum pod nazivom mali transformator za niski napon.
Iz njegove prepiske s dipl.ing. A. Kuhnom, koji je bio posrednik za patente, može se zaključiti i da je Marcel radio na konstrukciji različitih naprava i aparata npr.istosmjerni motor, jednofazni motor, variometar za radio.





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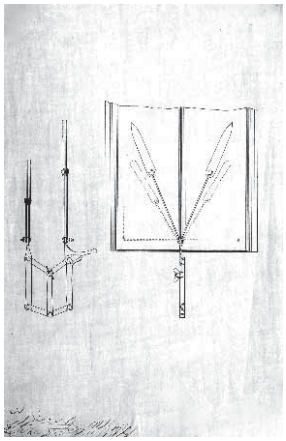
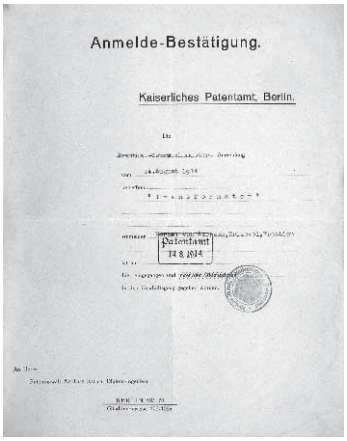



Anmelde-Bestätigung.
Kaiserliches Patentamt, Berlin.
Patentamt
14.8.1914

His first invention, a gyrocompass Kiepach, Esg. invented in 1910 in Berlin.
It is a device for the concurrent pointing of a position of the compas on various spots of the ship. He patented the same invention in London in 1911.
In Paris in 1912 he patented a dynamotor for illuminating various types of vehicles. The invention was provided for illuminating coaches, buses and carriages, and was based on the principle of an electric generator driven by means of such a vehicle.
Also in 1912, he filed with the Reichspatentamt in Berlin, an assembly of electric switch for Röntgen-apparatus.
In cooperation with Heinrich Weiland an invention was filed with the Reichspatentamt in Berlin entitled: small law voltage transformer.
Through his correspondence with A. Kuhn, B.Sc., who was a representative for patents, one may come to a conclusion that Marcel was working on the assembly of varoius devices and apparatuses for example: DC motor, single-phase motor, variometer for wireless application.

Mario Puretić rođen je 1905. godine u Sumartinu, na otoku Braču. Puretić je bio iz obitelji ribara i težaka. Zbog teške situacije, neimaštine i gladi, mladi Puretić je 1929. godine otplovio u Ameriku. U prvo vrijeme živio je u New Yorku, i radio u čeličanama na Long Beachu. Zatim je preselio u San Pedro u Kaliforniji i zaposlio se kao radnik ribar na brodovoma tunolovcima. Uvidjevši probleme koji se javljaju pri tunolovu, Mario Puretić izumio je i doradio izum tzv. Puretićevog koloturnika nazvan »power block». Godine 1956. Puretić je za ovaj izum dobio američki patent.

1977. godine posjetio je rodni Sumartin. Tom prigodom demonstrirao je primjenu power-block sistema za lov na srdele i tunu u Jadranu.

Sahranjen je u Sumartinu na otoku Braču 1994. godine.

MARIO PURETIĆ

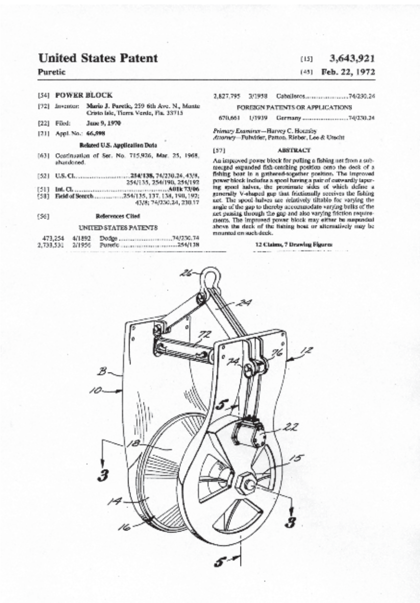
Mario Puretić was born in Sumartin, on the island of Brač in 1905 in the family of fishermen and laborers. In 1929 young Puretić saild off to America due to hardship, poverty and famine at home.

At first he lived for some time in New York and worked in steel plants of Long Beach. Afterwards, he moved to San Pedro, California and found a job as a worker on tuna boats, and soon realised the problems of tuna fishing. Mario Puretić has invented and improved the so-called Puretić's lifting tackle named: »power block».

In 1956 Mario Puretić was granted an American patent for his invention.

In 1977 he paid a visit to his hometown Sumartin. At that occasion he demonstrated the application of the power-block system for pilchard and tuna fishing in the Adriatic Sea.

He was burried in Sumartin, on the island of Brač in 1994.



United States Patent [15] **3,643,921**

Puretic [45] **Feb. 22, 1972**

[54] **POWER BLOCK**

[72] Inventor: Mario J. Puretic, 259 6th Ave. N., Monte Cristo Isle, Tierra Verde, Fla. 33715

[22] Filed: June 9, 1970

[21] Appl. No.: 66,998

Related U.S. Application Data

[63] Continuation of Ser. No. 715,936, Mar. 25, 1968, abandoned.

[52] U.S. Cl. 254/138, 74/230.24, 43/8, 254/135, 254/190, 254/192

[51] Int. Cl. A01k 73/06

[58] Field of Search 254/135, 137, 138, 190, 192; 43/8; 74/230.24, 230.17

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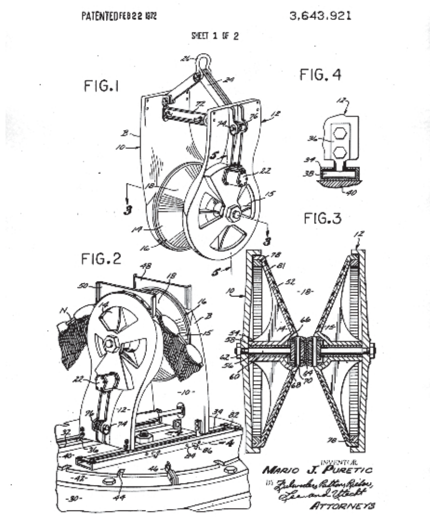
Primary Examiner—Harvey C. Hornsby

Attorney—Fulwider, Patton, Rieber, Lee & Utecht

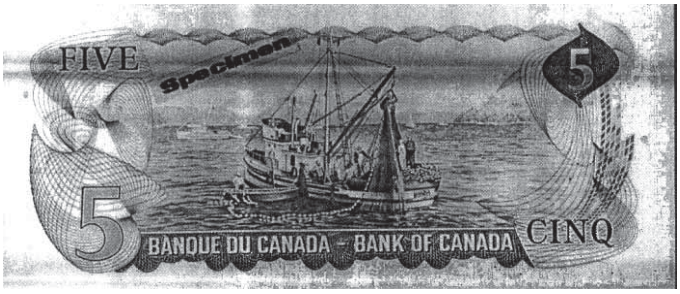
[57] ABSTRACT

An improved power block for pulling a fishing net from a submerged expanded fish-catching position onto the deck of a fishing boat in a gathered-together position. The improved power block includes a spool having a pair of outwardly tapering spool halves, the proximate sides of which define a generally V-shaped gap that frictionally receives the fishing net. The spool halves are relatively tiltable for varying the angle of the gap to thereby accommodate varying bulks of the net passing through the gap and also varying friction requirements. The improved power block may either be suspended above the deck of the fishing boat or alternatively may be mounted on such deck.

12 Claims, 7 Drawing Figures



Kada je Puretić u San Pedru počeo raditi kao radnik na ribarskim brodovima, ubrzo je uočio sve poteškoće rada na tunolovcu. Mreže pune ribe bile su teške i mukotrpno ih je bilo izvlačiti ponekad i po nekoliko sati, pri čemu je izlov bilo nemoguće zaštiti od napada morskih grabežljivaca.
To je Puretića potaklo na pronalaženje tehničkog rješenja ovog problema. Svoj prvotni izum postupno je dorađivao da bi na kraju došao do idejnog rješenja posebno oblikovanog uređaja s pogonjenim koloturnikom za podizanje mreže. Predvidio je da se uređaj montira na krmu broda ili na brodsku dizalicu. Izum je mogao imati elektromotor ili hidraulični pogon.
Puretić je svoj izum patentirao 1956. godine. Od 1955. godine u brodogradilištu u Seattleu počela je proizvodnja power-blocka prema Puretićevom izumu.
Puretićev izum omogućio je između ostalog i više no dvostruko povećanje godišnje količine ulova ribe.
Za doprinos razvoju svjetskog ribarstva njemu u čast od 1975. godine na kanadskoj novčanici od pet dolara otisnuta je slika ribarskog broda s njegovim izumom u primjeni iznad palube.
Mario Puretić prijavio je i ostvario još dvadesetak drugih patenata.



Soon as Puretić has started a job as worker on tuna boats in San Pedro, he has realised the problems of tuna fishing.
The fishing nets were heavy with fish and to pull them out of the sea was a heavy work that used to take several hours. During that time it was impossible to protect the catch against the attack of sharks.
That situation gave an incentive to Puretić to find a technical solution and resolve the problem. He gradually improved his original invention and reached the final solution of the specially formed device driven by the lifting tackle for fishing nets. He provided for the device to be mounted astern or to the derrick. The invention could have an electromotor or hydraulic drive. Puretić has patented his invention in 1956. Since 1955 the shipyard in Seattle began producing the power-block on the basis of Puretić's invention. Among other things on the basis of his invention the yearly catch of fish was more than doubled.
For his contribution to the development of the world fishing industry an in his honour, the Canadian five dollar banknote carries a figure of fishing boat featuring his invention in operation on board since 1975.
In his lifetime Mario Puretić applied for and was granted some twenty various patents.

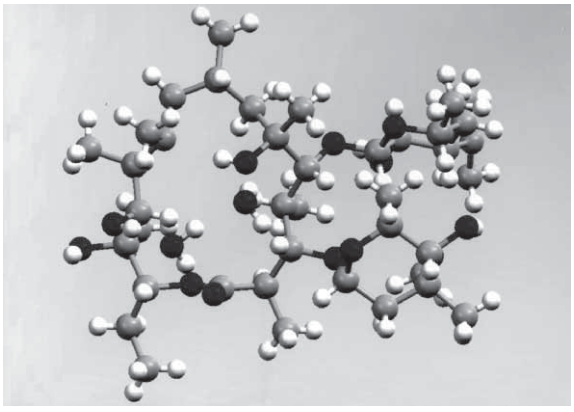
Slobodan Đokić, (Danilovgrad 1926. - Zagreb 1994.), diplomirao je 1952. godine na Tehničkom fakultetu u Zagrebu. Iste godine zapošljava se u Plivi, a 1956. godine postaje rukovoditelj Odjela za kemiju prirodnih spojeva u Istraživačkom institutu Pliva. Direktor je Istraživačkog instituta od 1971. do 1990. godine, nakon čega je kao savjetnik za istraživanje radio do odlaska u mirovinu 1992. godine.
Zajedno s dr. Tamburašev 1961. godine započinje istraživanje na kemiji makrolidnih antibiotika, što je rezultiralo sintezom novog makrolidnog antibiotika, kasnije prozvanog azitromicin, te je zajedno sa Zrinkom Tamburašev, Gabrijelom Kobrehel i Gorjanom Lazarevski koautor osnovnih patenata za njegovu pripravu. Koautor je više od 120 znanstvenih radova i patenata. Dobitnik je brojnih priznanja za svoj istraživački rad u zemlji, a uz Gabrijelu Kobrehel dobitnik je nagrade Američkog kemijskog društva "Heroji kemije 2000".

Gabrijela Kobrehel, rođ. Vazdar, (Obedišće 1941.), diplomirala je 1964. godine na Tehnološkom fakultetu u Zagrebu. Iste godine počinje raditi u Istraživačkom institutu Pliva, gdje ostaje do odlaska u mirovinu 1999. godine. Njezin istraživački interes bio je usmjeren prema sintezi polusintetskih makrolidnih antibiotika. Sinteza azitromicina je kruna njezinog istraživačkog rada. Koautor je više 45 znanstvenih radova i patenata s područja polusintetskih makrolidnih antibiotika.
Dobitnica je brojnih priznanja za svoj istraživački rad, a uz Slobodana Đokića dobitnica je nagrade Američkog kemijskog društva "Heroji kemije 2000".

SLOBODAN ĐOKIĆ · GABRIJELA KOBREHEL GORJANA LAZAREVSKI · ZRINKA TAMBURAŠEV

Gorjana Lazarevski, rođ. Radobolja, (Omiš 1946.), diplomirala je 1969. godine na Tehnološkom fakultetu u Zagrebu. Iste godine počinje raditi u Istraživačkom institutu Pliva, gdje ostaje do odlaska u mirovinu 2003. godine.
Cijeli radni vijek istraživala je kemijske transformacije makrolidnih antibiotika, što je rezultiralo koautorstvom na više od 40 znanstvenih radova i patenata. Dobitnica je brojnih domaćih nagrada za svoj istraživački rad.

Zrinka Tamburašev, rođ. Perić, (Sisak 1921. - Zagreb 2003.), diplomirala je 1948. godine na Tehničkom fakultetu, Kemijski odsjek u Zagrebu. U Plivin Istraživački institut došla je 1957. godine gdje je radila do odlaska u mirovinu 1980. godine.
Od 1972. godine radila je kao voditelj grupe za polusintetske makrolide, a 1974. postala je rukovoditelj Odjela za prirodne spojeve. Tada je doktorica Tamburašev započela i rad na sintezi novog makrolidnog antibiotika, kasnije prozvanog azitromicin, te je zajedno s Slobodanom Đokićem, Gabrijelom Kobrehel i Gorjanom Lazarevski koautor osnovnih patenata za njegovu pripravu. Od 1978. godine pa do odlaska u mirovinu, bila je rukovoditelj istraživanja na području baznih sirovina u Plivinom Istraživačkom institutu. Koautor je više od 25 znanstvenih radova i patenata. Dobitnica je brojnih domaćih priznanja za svoj istraživački rad.

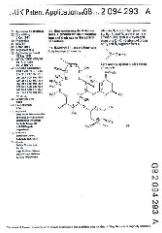


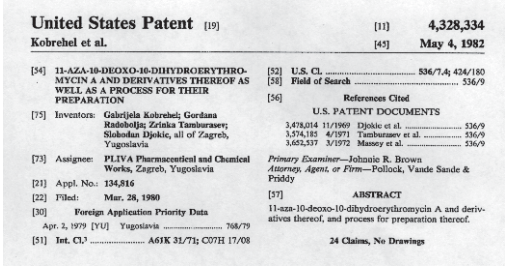
Slobodan Đokić, (Danilovgrad 1926 - Zagreb 1994) in 1952 graduated at the Technical Faculty, Zagreb and was employed in Pliva, where in 1956 became head to Department of natural chemical compounds at the Research Institute of Pliva. Since 1971 until 1990 he was director of Research Institute and afterwards adviser for research until his retirement in 1992. In 1961 in cooperation with dr Tamburašev the research of the chemistry of macrolid antibiotics was initiated, which resulted by synthesis of a new macrolid antibiotic, subsequently named: azithromycin. Togehter with Zrinka Tamburašev, Gabrijela Kobrehel i Gorjana Lazarevski he is a co-author of the basic patents for the preparation thereof. He is likewise a co-author of over 120 scientific papers and patents. Dr Đokić received numerous awards for his research work at home, and with Gabrijela Kobrehel a prize of the American Chemical Association: "Heroes of Chemistry 2000".

Gabrijela Kobrehel, born Vazdar, (Obedišće 1941) in 1964 graduated at the Faculty of Technology, Zagreb. In the same year she was employed in the Research Institute of Pliva until her retirement in 1999. Her research interest was directed to the synthesis of half-synthetic macrolid antibiotics. The synthesis of azithromycin was the crown of her research activity. Mrs. Kobrehel is a co-author of over 45 scientific papers and patents in the field of half-synthetic macrolid antibiotics. For her research work she received numerous awards and with Slobodan Đokić a prize of the American Chemical Association: "Heroes of Chemistry 2000".

Gorjana Lazarevski, born Radobolja, (Omiš 1946) in 1969 graduated at the Faculty of Technology, Zagreb. In the same year she was employed in the Research Institute of Pliva until her retirement in 2003. During her active life she was researching the chemical transformations of macrolid antibiotics, which resulted in co-authorship of over 40 scientific papers and patents. For her research work she received numerous domestic awards.

Zrinka Tamburašev, born Perić, (Sisak 1921 - Zagreb 2003) in 1948 graduated at the Faculty of Technology, Department of Chemistry, Zagreb. In 1957 she joined the Research Institute of Pliva until her retirement in 1980. Since 1972 Mrs. Tamburašev was head of the group for half synthetic macrolids, and in 1974 became head of Department of natural compounds. Then, dr Tamburašev initiated her work on the synthesis of macrolid antibiotics as well, subsequently named: azithromycin. Together with Slobodan Đokić, Gabrijela Kobrehel and Gorjana Lazarevski she is a co-author of basic patents for the preparation thereof. Since 1978 until her retirement she headed the research in the field of basic raw materials at the Research Institute of Pliva. Dr Tamburašev is a co-author of over 25 scientific papers and patents. For her research work she received numerous domestic awards.





United States Patent [19]
Kobrehel et al.

[11] 4,328,334
[45] May 4, 1982

[54] 11-AZA-10-DEOXO-10-DIHYDROERYTHROMYCIN A AND DERIVATIVES THEREOF AS WELL AS A PROCESS FOR THEIR PREPARATION

[75] Inventors: Gabrijela Kobrehel; Gordana Radobolja; Zrinka Tamburasev; Slobodan Djokic, all of Zagreb, Yugoslavia

[73] Assignee: PLIVA Pharmaceutical and Chmical Works, Zagreb, Yugoslavia

[21] Appl. No.: 134,816

[22] Filed: Mar. 28, 1980

[30] Foreign Application Priority Data
Apr. 2, 1979 [YU] Yugoslavia 768/79

[51] Int. Cl.³ A61K 31/71; C07H 17/08

[52] U.S. Cl. 536/7.4; 424/180

[58] Field of Search 536/9

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3,574,185	4/1971	Tamburasev et al.	536/9
3,652,537	3/1972	Massey et al.	536/9

Primary Examiner—Johnnie R. Brown
Attorney, Agent, or Firm—Pollock, Vande Sande & Priddy

[57] ABSTRACT
11-aza-10-deoxo-10-dihydroerythromycin A and derivatives thereof, and process for preparation thereof.

24 Claims, No Drawings

AZITROMICIN (SUMAMED, ZITHROMAX)

Makrolidni antibiotici su skupina spojeva kojima je zajednička karakteristika prsten sastavljen od 12-16 atoma. Najvažniji predstavnik, eritromicin, prisutan je u kliničkoj primjeni preko pola stoljeća. Njegova struktura sastoji se od 14-ero članog prstena na koji su vezana dva šećera: kladinoza i desozamin. Eritromicin pripada antibioticima srednje širokog spektra djelovanja i primjenjuje se kod bakterijskih infekcija dišnih puteva, kože i mekog tkiva.

Premda djelotvoran i siguran, veliki nedostatak predstavlja njegova nestabilnost u kiselom mediju želuca, gdje se brzo raspada na biološki neaktivne razgradne produkte. To je bio poticaj brojnim istraživačima da kemijskim promjenama molekule poboljšaju svojstva eritromicina.

U Istraživačkom institutu Pliva dr. Đokić i dr. Tamburašev započeli su prva istraživanja na kemijskim transformacijama eritromicinske molekule ranih 60-tih godina prošlog stoljeća. Azitromicin je sintetiziran krajem 70-tih godina i zaštićen je s dva patenta.

Njegova struktura, za razliku od eritromicina ima 15-ero člani prsten u koji je ugrađen dušik kao dodatni atom, zbog čega je ova skupina nazvana AZALIDI. Novi antibiotik pokazuje proširenu antibakterijski spektar, nisku toksičnost i vrlo dobru podnošljivost. Terapijska doza azitromicina je oko 10 puta manja nego eritromicina, a vrijeme terapije 2-3 puta kraće. PLIVA je tvrtki PFIZER 1986. godine prodala licenciju za azitromicin.

AZITHROMYCIN (SUMAMED, ZITHROMAX)

Macrolide antibiotics are a group of compounds having a common characteristic of a ring composed of 12-16 atoms. The most important representative, erythromycin, is present in the clinical application for more than half of a century. Its structure is composed of 14-member ring to which two sugars are attached: cladinose and desosamine. Erythromycin belongs to a group of antibiotics with medium broad spectrum of activity and is used in treating bacterial infections of upper respiratory tracts and of soft tissue.

Although effective and safe, its instability in gastric acid medium, where it is rapidly decomposing to the biologically inactive dissolving products, presents its great disadvantage. For numerous researchers an impetus was to improve the characteristics of erythromycin by chemical transformation of its molecular formula.

In the early 60-ties of the last century in the research institute of Pliva, dr Đokić and dr Tamburašev initiated the first researches of the chemical transformations of the molecule of erythromycin. Azithromycin was synthesised by the end of 70-ties and protected by two patents.

Its structure, on the contrary to erythromycin, has a 15-member ring in which an additional atom of nitrogen is incorporated, therefore this group is named AZALIDES. The new antibiotic features have a broader antibacterial spectrum, a low toxicity and very good tolerance. Therapeutic dose of azithromycin is ten times lower than erythromycin dose and the time of therapy is 2-3 times shorter.

In 1986 PLIVA sold the licence for azithromycin to the PFIZERcompany.

ISBN 953-6513-47-1

Naklada
300 komada

Zagreb, srpanj 2005.