

Swedish innovations through history

Skype

Niklas Zennström (1966-) and Janus Friis (1976-)

In 2003 Swedish inventor and entrepreneur Niklas Zennström launched Skype - the most famous solution for free internet telephony, together with Janus Friis. The technology of Skype is based on a network called the Global Index, which is a newer generation of the FastTrack file-sharing network Kazaa, an invention also constructed of Zennström and Friis.

Tetra Pak

Ruben Rausing (1895-1983)

The Tetra Pak is a system for storage, packaging and distribution of liquid foodstuffs such as milk and fruit juice. It was the trainee Erik Wallenberg (1915-) who came up with the original idea of the milk container while Ruben Rausing's wife, Amalie Rausing, was one of the people that developed the invention. She suggested that they would use the same technique as when you make sausages – by filling the container and cutting it off in a continuous flow.

GSM

Östen Mäkitalo (1938-) and Jan Uddenfeldt (1950-)

As two key innovators in the Swedish companies Telia and Ericsson in the 1980's, Östen Mäkitalo and Jan Uddenfeldt took part in developing the digital cellular standard GSM from the very beginning. The Global System for Mobile communications (originally from Groupe Spécial Mobile) is today used by over 3 billion people.

Automatic cash handling machine

Leif Lundblad (1938-)

In 1976 a machine for automatic cash handling, to count and dispensing bank notes, was invented by Leif Lundblad. His company, Inter Innovation, became a world-leading manufacturer of note handling equipment. Today Leif Lundblad has over 300 patents within a wide range of areas.

Computer mouse**Håkan Lans (1947-)**

Regarded as one of Sweden's foremost inventors, Håkans Lans' inventions includes the digitizer – a precursor of the computer mouse –and the fundamental principles of computer colour graphics. He is also responsible for the further development of the satellite navigation system Global Positioning System (GPS) so that it can be used by aircraft, ships and other craft (GP & C Total System).

Local anesthetics**Nils Löfgren (1915-67) and Bengt Lundqvist (1922-52)**

During the 1930s two Swedish scientists conducted large-scale experiments leading to the development of the local anesthetic LL-30. Astra, the pharmaceutical company, took over the development and by 1948 it had developed Xylocain.

More Swedish innovations:

Dynamite was developed by Alfred Nobel (1833-96) in 1866, when he discovered that the mixture of nitroglycerine and kieselguhr – a porous diatomite – was very stable and easy to handle, but retained its explosive characteristics. Today Alfred Nobel's is known for the Nobel Prizes in physics, chemistry, medicine/physiology, literature and peace, to be given to those who had "conferred the greatest benefit on mankind".

High-voltage direct current (HVDC) transmission is a method that was developed at the Swedish company ASEA under the leadership of Uno Lamm (1904-89).

The *AXE system* was a fully electronic, computer-controlled digital telephone switching system invented by Ericsson and the pioneer Åke Lundquist (1932-). AXE gave the subscriber access to a variety of services such as wake-up calls, automatic call forwarding and programming of frequently dialled numbers.

The *safety match* was invented by Gustaf Erik Pasch (1788-1862), when he replaced the hazardous yellow phosphorus found in the matches of that period with red phosphorus and put it on the striking surface instead of the match head.

Losec is an ulcer medicine that inhibits cells in the stomach lining from producing hydrochloric acid. Losec is sold and manufactured by Astra and was developed by its subsidiary AB Hässle. In 1988 Losec was approved as a prescription drug in Sweden.

The *dialysis method* is a Swedish innovation that works as an "artificial kidney", devised in 1965 by Nils Alwall (1904-86) and Lennart Östergren (1944-).

Beta-blockers – Swedish pharmaceutical companies began working with research projects based on receptor mechanisms in the 1960s. These projects led to some important drugs known as beta-blockers, which are used in treating asthma, cardiovascular diseases and various other conditions.

The *adjustable wrench* was invented by Johan Petter Johansson (1853-1943). Throughout the world, about 40 million monkey wrenches of the same model are produced annually. Johansson made a total of 118 inventions, several of them world famous and still in production.