

## HISTORY OF THE SELF-ADJUSTING DRIVE WHEEL

**Why is it that to the present day only very few people have heard of this pioneering invention with a reduction of the wear rate of at least 30%?**

I developed the patent DE4317461 / EP 0599156 at a time when I was employed as an engineer in the conveying system industry, and the patent application was filed on 26.5.1993 by my former employer, *PWH Anlagen und Systeme GmbH* (today: **Thyssen Krupp**) under the title of a self-adjusting chain wheel.

In 1996, my employer (Thyssen Krupp) assigned the patent rights to me. The original patent „self-adjusting chain wheel“ could only transmit the pressure forces to the spring. This is why I abandoned the patent in 2006.

Since the patent rights of this old patent DE4317461 / EP 0599156 were granted in 1996, I started developing and improving the self-adjusting sprocket further based on this patent.

Now, with the possession of the patent rights, I started to develop further and improve the self-adjusting chain wheel on the basis of the patent. For instance, it occurred to me to arrange the transmission spring such that both pressure and traction from the tilting movement of the tooth segments could be transmitted with the help of the spring.

Then, I started to market the patent myself and for the first time, I visited chain producers in order to present the self-adjusting chain wheel. However, my possibilities of marketing as an employee were limited at that time.

The company Charles Zimmermann in France wanted to use the patent underground in a salt mine with round link chains. As frequent chain breaks due to process tolerances are common with this kind of application, this choice seemed reasonable to me because the self-adjusting chain wheel adjusts to the chain. I continued my investigations on the basis of the round link chain, and I made drawings, calculations and finite elements analysis which I published in October 1999.

Now, with the calculation with FEM in my hands, I looked for a producer who was ready to use my patent.

I visited a large number of chain producers in Germany to introduce my

patent, but they were not interested in use. On this, I have to say that unfortunately I offered the patent ONLY to chain manufacturers instead of operators at the time.

In 2000, I was contacted by the company Koch, because they wanted to use my patent. Now, I had found an innovative engineer, Mr Bertele, wanted to produce my further development in his machine factory.

The company Koch had been entrusted with the delivery of a portal scraper for the power station in Ensdorf. Due to the proximity of the residential area, a solution with the lowest possible noise generation was a requirement. This is the reason why they opted for the self-adjusting chain wheel.

On May 31, 2001 an inspection of the portal scraper in operation was held in the presence of an employee of the company Kettenwulf and the newspaper „Saarbrücker Zeitung“. The „Saarbrücker Zeitung“ wrote an article on June 16/17, 2001 with the heading: „The Odyssey of an inventor with patience and stamina“.

After several meetings and presentations, the company Ketten Wulf on April 17, 2002 decided to sign a license contract on marketing of the patent at the time, DE 4317461 / EP 0599156 with me in order to run further tests which is what happened. In 2003 I was then sent the examination report for free disposal and use (without any requirement of secrecy) and the license contract entered into with me was terminated without stating reasons on 26 August 2005.

Reading the article in the journal Konstruktion 7/8-2002 with care, you will see that the self-adjusting sprocket is most highly praised by an employee of Ketten Wulf, which I subjectively believe to be accurate.

## **HOW DID IT CONTINUE?**

As I was a diligent engineer and employee at that time, and had no company to back me up, I wanted to wait and see at first how practical use at Ensdorf was going to develop.

In 2010, I visited the Ensdorf power plant to ask about my self-adjusting

sprocket. I learned that the self-adjusting sprocket that was installed in 2001 was outstanding and still working without wear.

**This means that during the entire time, it had not once been necessary to replace the cost-intensive chain.**

**When I visited Ensdorf again in November 2011, they removed an entire chain link for me, which is shown in the adjacent picture. You can see clearly that the chain link bolts still show now wear after all this time.**



After I had seen how successfully this sprocket was used, I applied for an EU patent for the new sprocket developed further by me under the designation "self-adjusting drive wheel" at the end of 2010 under numbers: EP 2594824 and DE 102011118515.

This sprocket patent optimises the distribution of the individual tooth forces on the chain.

The BENEFITS of the newly registered patent in an even more improved and expanded form are in wear reducing again considerably as compared to the sprocket used in Ensdorf.

This patent has been validly granted and the patent offers protection from the following countries at this time.

Germany – Austria – Switzerland – France – Great Britain – Italy – Spain – Romania – the Czech Republic and Poland.

After the patent had been granted, I repeated the publication of the **tremendous advantages of the self-adjusting drive wheel** which at that time had already been operating for more than **13 years on a portal scraper, with the benefit for the operator having further increased.**

I then wasted some time with offering the self-adjusting sprocket to chain manufacturers again for a while.

My experience with the German chain industry so far has, however, shown me that the German chain industry is obviously not interested in using my patent.

Originally, I wanted the patent to be sold in Germany and then used around the world. By now, I have understood that it is high time to present this "self-adjusting drive wheel" to the plant constructors, and specifically the **operators around the world** directly. As I find, the operators are enormously interested in my invention.

Kempenich, 18 November 2015

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