

An open and shut case

Choosing the right fastening for a piece of clothing or equipment could significantly alter the effectiveness of the item as a whole. According to the founder of fastenings brand Systemmag, Éric Sitbon, getting it right could even become a matter of life and death.

Systemmag was established in Paris in 2000. The product range is based on several new magnetic fastening systems used to close and adjust clothing, shoes, bras, luggage and other accessories, such as hats and watches. According to Mr Sitbon, the company's products can be used as an alternative to traditional closures such as buttons, clasps, zippers, hook-'n-loop and laces. Furthermore, he claims the comparative benefits are great.

Mr Sitbon came up with the idea in 1997 under very everyday circumstances. He found that when his young son was desperate to go to the toilet it was difficult to undress him quickly enough, which often led to messy accidents. He decided something needed to be done to make dressing and undressing children easier and quicker, and the magnet idea was born.

His first magnetic device, patented in 1998, was designed to help different parts of a garment, shoe or accessory to remain in contact, close or to be adjusted. He won a 'best new project' prize for the innovation the following year from ANVAR, a branch of the French ministry of research. By 2000, Mr Sitbon and his wife Agnes had set up a company, Salome, to develop and commercialise the invention, and the company had won a second award from ANVAR, this time for design development.

The magnetic closures use two blocks of magnets made from small pieces of magnetised ceramic arranged in one or more rows and glued to a plastic support. The use of small magnets offers flexibility and means the fastenings can be used to fit round complex shapes, for example in garment applications. The strength of the fastening can be adapted depending on the end-use. As an example, the company says a closure comprising 20 magnets can support a mass of 6 kg with a force of 60 N. Opening it requires just 0.6 kilograms (6 N), which is easily achievable using just two fingers.

The benefits of using the magnetic fastening system are numerous, according to the company. Mr Sitbon claims its systems are easy to use, adjustable, quick to undo and refasten and can be used for a wide range of end-uses.

The importance of silence

One important area of application for the technology is in military clothing and equipment, one of the situations where the choice of fastening could protect lives. Mr Sitbon claims there are several benefits of using Systemmag for pockets in military apparel, for example. "If you need to take out bullets or equipment from a pocket you don't want to be making any noise," he says. "This is the solution; it's completely silent." He goes on to say that using a fastening that makes a noise, such as hook-'n-loop, could cost many lives as well as forfeiting a mission.

In order to illustrate this point, Mr Sitbon claims that in 2008 the French Gendarmerie's counter-terrorism and hostage rescue unit GIGN (Groupe d'Intervention de la Gendarmerie Nationale) managed to lose a very dangerous man they were trying to capture. He claims they spent six months preparing to arrest the man, but that when the group got into position, one man opened a hook-'n-loop fastening and the whole mission failed.

Another benefit for the military is that the magnets open instantly, unlike other fastenings such as buttons. This means soldiers can access ammunition and other equipment very quickly in pressurised situations. And, the company founder says, if the person wearing the jacket takes off their gloves and places them in their pockets, they are less likely to fall out with the strong magnetic closure in place, while other fastenings may fail to reconnect and the gloves could fall out.

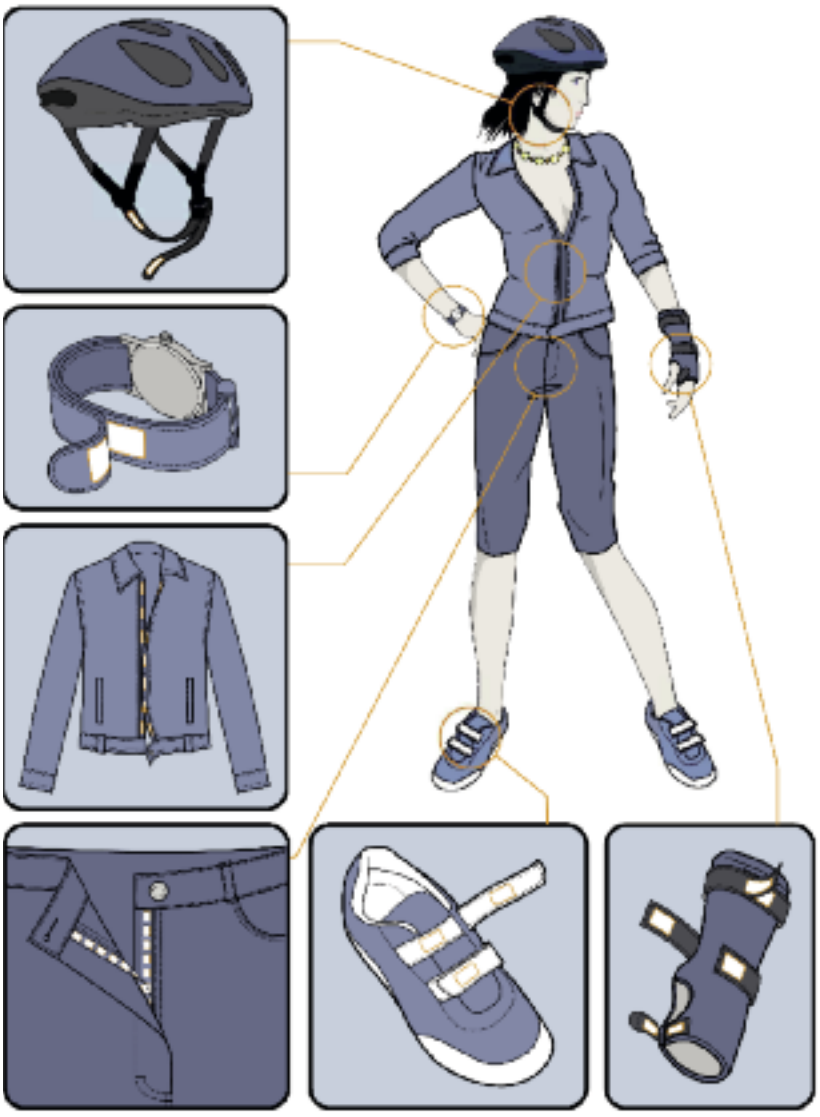
Systemmag products can also be used to secure the openings of military tents. The fastening is windproof and stops sand and microbes getting in. This is particularly important for tents in which people are receiving medical treatment.

Sporty uses

In terms of sporting applications, Mr Sitbon believes there are many possibilities. One end-use is in snow jackets, which the company has been working on for three years. A new collection was recently launched using the company's magnetic fastenings for the sleeve flaps and collars. The reason they are so effective, he claims, is that the magnets work best in cold temperatures and prevent cold air from getting inside the jacket.

Furthermore, if the jacket is being worn over a jumper, magnets are more practical than some other fastenings because the fibres cannot get caught and damaged. Other benefits are that the fastening is adjustable so the wearer can tighten or loosen sleeves and collars for added comfort, and that it provides instant access and closure so that the wearer is exposed to the cold for a shorter amount of time.

Other sporty applications for the technology include wet suits, parachutes, and cycling. Mr Sitbon has mocked up a prototype for a wetsuit, although it hasn't been developed commercially yet. He claims it provides a completely waterproof fastening and hopes the company will have the opportunity to use the idea in the future. Systemmag technology has already been used in parachutes. According to Mr Sitbon, the fastening has been used in second parachutes, in the event that the parachutist's first fails to open. "This could affect the life of man; it's a big responsibility," he says. It is far more reliable than some other fastening solutions, he claims.



There are a number of different uses for Systemmag's magnetic fastenings within the sports sector.

Systemmag

In terms of cycling, the technology can be used to improve visibility. For example, if someone wants to ride a bike at night, they can wear trousers with a fold that is held together by the magnets when they are not in motion. The flaps can be pulled apart before the cyclist starts pedalling to reveal a brightly coloured panel inside so other road users are more likely to spot the cyclist. The trousers can be fastened back into ordinary-looking trousers at the end of the ride. "There are a lot of possibilities," Mr Sitbon claims.

One of the few drawbacks, according to the company, is cost. "The cost of hook-'n-loop is one cent for a long piece," he says. "Our system is more expensive." However, the inventor believes customers are likely to be prepared to pay more for the technology "because we don't sell accessories, we sell systems". Added to this, Mr Sitbon claims the lifespan of the finished article is paramount. "Hook-'n-loop systems lasts maybe one or two years. Our system lasts 20 years," he says. Products using the technology can be machine washed and the fastening system is Oeko-Tex approved.