

The Tiny Miracle Behind Spiderman

H A R U N Y A H Y A



These days another film being watched with great interest by everyone from 7 to 70 is doing the rounds: "Spiderman-2."

The film is a sequel to the first, which broke "first three day" box office records when it was first released in the USA two years ago, and this too looks likely to break further records.

The film broke the "first day" box office record in North America with \$40.5 million.

A brief summary of the

story line is as follows:

Tony Parker uses the advantages given him by his powers to help others and has to fight the dark forces he encounters in doing so. Yet he also has to strike a balance between his roles as Spiderman and as a university student. This time Peter finds himself up against the powerful, many-armed, evil Dr. Octopus, or "Dr. Ock." Peter needs all his superhero powers to stop this eight-armed madman.

With this exciting story line and its stunning special effects, Spiderman-2 is a real visual extravaganza for viewers.

The Spiderman character is based on the classic Marvel Comic cartoon hero. Designed by Marvel director Stan Lee and company character designer Steve Ditko, Spiderman first saw the light of day in 1962, in the final edition of the not too successful cartoon Amazing Fantasy. The character gained such rapid popularity that the name Amazing Fantasy was changed to Amazing Spider-Man, and readers became re-acquainted with him in March 1963.

Let us now have a look at the features that make this superhero the "hero" he is.

The Spider Leap

Spiderman is capable of leaping great heights, just like a spider.

The Spider Web

Spiderman produces a web similar to that of a real spider and uses it to enmesh anyone he wishes to catch.

Spider Reflexes

Just like a spider, Spiderman possesses fast, powerful reflexes for protection in moments of danger.

Spider Senses

In addition to his reflexes, Spiderman also has "spider senses" to protect him from danger. Thanks to these it is impossible ever to attack him unawares from behind. These reflexes and senses make him a hero hard to beat.

Adhesion to Surfaces

One of Spiderman's main attributes is the way that he can walk on just about any surface, again just like a real spider.

Let us now have a look at few of these magnificent features in real spiders.

Functional Legs

The spider has four pairs of legs enabling it to walk and climb even under the most difficult conditions. Each leg consists of seven parts. At the end of each leg are hairs called "scopula." Thanks to these the spider is able to walk on walls or even upside down.

Superior Sensory Capabilities

With the exception of jumping spiders, most spiders have rather poor sight, and can only see for short distances. This disability, which might be a great disadvantage for a hunter, is compensated for by the spider's particularly sensitive early warning system.

This warning system is based upon the sense of touch. The body is covered with hairs which are very sensitive to vibration. Each one of these hairs is attached to a nerve ending. Vibrations resulting from touch, or even sound and smell, stimulate these hairs. The trembling of the hairs activates the nerve endings. The nerves then rapidly transmit the message to the brain. In this way spiders become aware of even the smallest vibration.

Venom-Pumping Fangs

The spider has two powerful fangs in front of its eyes. These fangs are weapons the spider uses for hunting and for protection. Behind each fang is a venom gland which pours its lethal poison into a poison hook. When the spider wishes to immobilise its prey, it sinks its fangs into it. Then it pumps venom into its victim's body through holes in its fangs.

Water-Walking

Water-spiders possess a special structure allowing them to walk on water. These spiders have a thick, velvety plait consisting of hairs covered in a water-resistant wax on the ends of their feet. This allows the spider to walk on water without sinking.

The Web: A Design Marvel

The spider web is made up of load-bearing frame threads and spiral capturing threads laid over these and coated with a sticky substance, as well as threads binding all the threads together. The spiral coated sticky threads are not completely tied to the scaffolding threads. In this way the more an insect caught in the web struggles, the more it gets stuck to the web. As the capturing threads stick all over the insect, they gradually lose their elasticity, both growing stronger and stiffening. In this way the insect is trapped and immobilised, and can be violently cut up. After this the prey, held by the unyielding scaffolding threads, like a wrapped-up, living food parcel, has no alternative but to wait for the spider to come and deal the final blow.

Spiders weave their webs to suit the size of the creatures they wish to hunt. The angle of webs is also changed depending on the sort of prey that is expected to be caught (flying, walking, crawling, etc.). This both lessens damage and increases the trapping capacity.

The Miracle of Silk

Spider silk is five times stronger than steel of the same thickness. Steel, known for being one of the strongest materials in the world, is an alloy produced in large factories in a series of processes. Spiders' silk, however, five times stronger than steel, is not produced in large factories: it is made by an arachnid. Just about any spider we can see anywhere can produce it. Another striking feature of the silk is that it is very light. We can demonstrate this with an example. A silk thread stretching around the whole world would only weigh 320 grams.(1) In addition, spider silk can stretch to four times its own length. It is very difficult to find a material both strong and elastic. For example, steel cables are one of the strongest materials around. But because they are not elastic like rubber, they slowly lose their shape. And although rubber cables do not lose their shape, they are not strong enough to lift heavy weights. On the other hand, as has been described above, spider silk is five times stronger than steel wire of the same thickness, and 30 percent more elastic than rubber of the same thickness.(2)

Spiders make different threads in their bodies for different purposes. These silks, in the same way as they have different qualities from the point of view of strength and elasticity, also exhibit different thicknesses and levels of stickiness. For example, although the dragline, which plays such a large part in the spider's life, does not possess the quality of stickiness, it is nevertheless strong and elastic. It can easily bear weights up to two or three times the weight of the spider. It is thanks to this silk that the spider, carrying the prey it has caught, can move safely up and down.

"Superheroes" Are Based on "Super Animals"!

Everyone remembers various superheroes from his or her childhood: Superman, with his ability to fly like a bird;

Batman, who moves silently and has many other bat-like abilities; Spiderman, the subject of this article, and many more ... If you have noticed, all these heroes have one thing in common; they are all heroes because they possess various superior animal properties! These animals have been created with such superior features that fictitious human beings who possess just a few of them turn into "heroes" able to easily perform tasks that a normal person could never manage. When we examine these animals used as role models for these heroes we do indeed encounter the most impressive properties.

As we have seen, the spider is an animal with spectacularly impressive features. It is of course impossible for these properties to have come into being in the spider by chance, or for a living thing such as spider with no powers of reasoning to have planned these features and placed them inside its own body. These superior features of the spider show that God created the spider flawlessly, just as He did all other living things.

Spiderman, currently playing in cinemas all over the world, possesses just a few of a spider's properties. As we hold our breath and watch these features in action in an imaginary character on the screen, we should also consider the spider itself, which possesses so many more, and feel even greater excitement in the face of God's magnificent creative artistry.

It must not be forgotten that Spiderman and all other superheroes are imaginary characters based on the wonderful living things created from nothing by God.

References:

- 1- Bilim ve Teknik Görsel Bilim ve Teknik Ansiklopedisi (Science and Technology Görsel Science and Technology Encyclopedia), p. 1087
- 2- Technology Review, Synthetic Spider Silk, October 1994, p. 16