

GPS Glasproduktions-Service INNOVATIONS IN SHEAR SPRAY SYSTEMS

Glass production improvements



PARALLEL SERVO SHEAR MECHANISM WITH INTEGRATED COOLING SPRAY NOZZLES

German-based IS machine and component manufacturer GPS came up with an inspiring way to showcase its innovations to customers and interested visitors at glasstec 2016 by installing a real 12 section IS machine at the exhi-

During glasstec 2016, GPS had a real 12 section IS machine up and running at its stand to show visitors its new gob delivery system, aimed at improving efficiency and optimizing glass production.

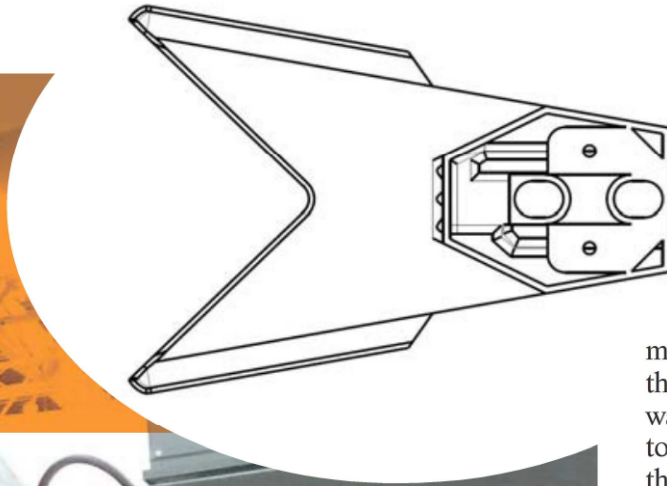


Fig. 1 - Schematic drawing showing a blade with integrated spray system for GPS IS machines, from below



bition. This complex installation certainly captured the attention of glasstec visitors in Düsseldorf, though it was in fact set up to help GPS provide an informative demonstration of its six new patents at the world's leading trade fair for glass. The 40-ton IS machine was used to demonstrate a new gob delivery system, a practical safety door, a shear spray system that

is integrated in the shear blades, an automatic mould lubrication system, a servo plunger and a deadplate cooling system.

Shear precision is essential

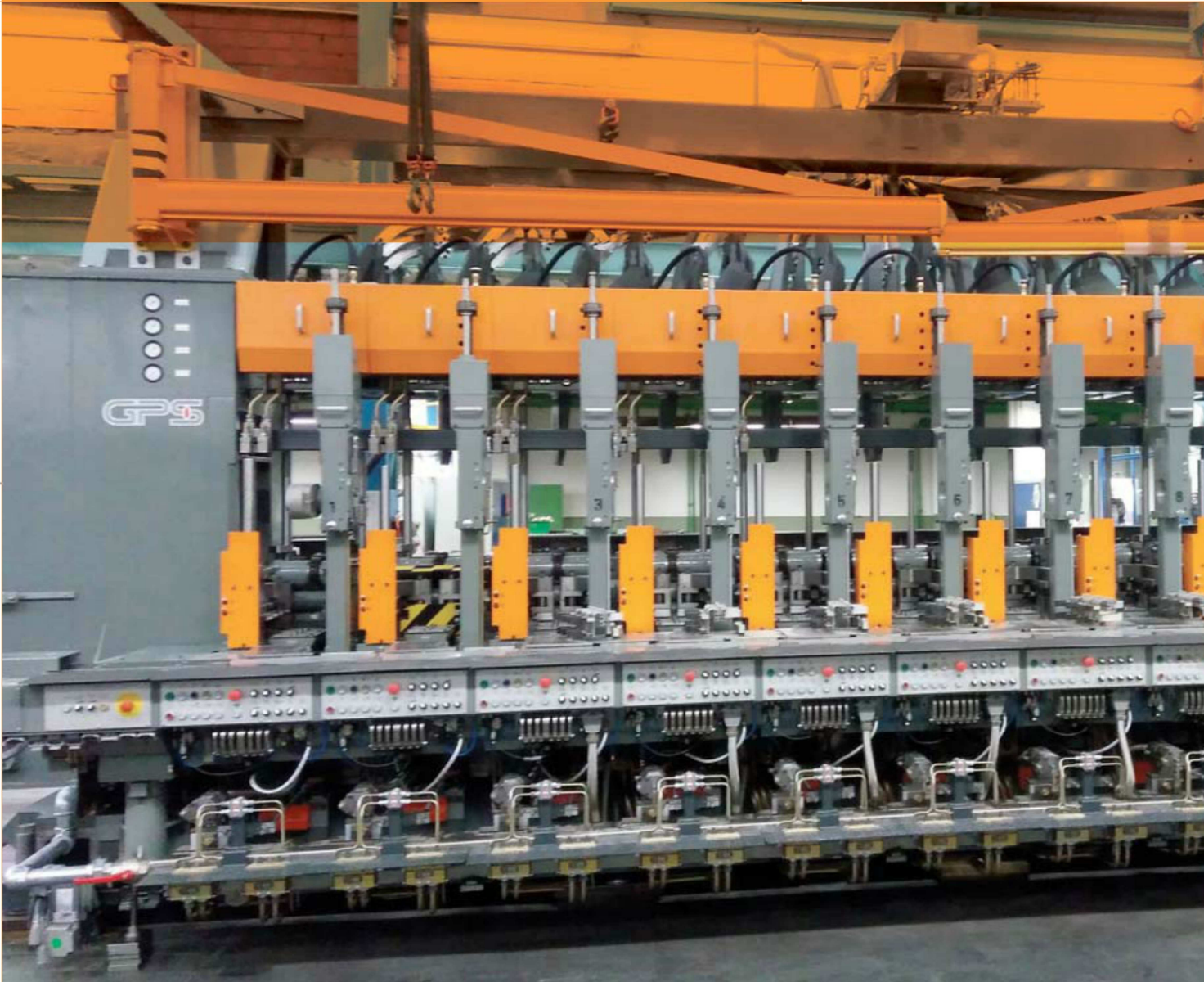
One of the innovations that met with a particularly positive response at glasstec was the shear spray system. GPS's concept for improving the efficiency of the IS

machine's shears and optimising the glass manufacturing process was welcomed by glasstec visitors, who told the GPS experts at the stand that this was an area where optimisations are urgently needed. The shear function is to consistently cut the glass gobbs into the right shape and size, as well ensuring that they precisely conform to weight specifications. It is vital that their shears operate with maximum precision so that the glass manufacturing companies can deliver consistently high quality products to their customers.

Heat impairs shear efficiency

Shears are generally positioned underneath the feeders, which comprise a plunger and a clay pipe the turning tube. Their metal blades are exposed to the heat from the feeders and the orifice ring for lengthy periods of time without adequate protection. Also, blades also heat up to a very high temperature and stay hot because they are in constant contact with the molten glass. Normally, they have to cut a glass strand being pressed through an orifice ring into between one and five gobbs. Each cut takes between one and two tenths of a second because the shears perform around 200 cuts per minute depends on machine size and article speed, and they are exposed to the hot glass for around 20 seconds during the course of one minute – so they cannot cool down.

If the metal shear blades get too hot and do not have sufficient lubrication the molten glass adheres to them and operators have to stop the entire machine to exchange them. Outdated technology at this stage of the produc-



tion process results in wasted time and money.

PREVIOUS APPROACHES

Spray systems are generally used to prevent the shear blades from overheating. They continuously lubricate the shears by applying an oil-water mixture to them with compressed air and cooling them with water. Some have nozzles that combine lubrication and cooling. The spray system can either be affixed to a holder directly underneath the orifice ring but above the shear blades to spray them from above. Or it can be affixed under the shear blades to spray them

from below. The drawback of spraying from above is that the spray system widens the distance between the orifice ring and the shear. This means that the glass gobbs are not cut when they emerge from the orifice ring, but further down, which considerably reduces cutting precision. Spraying from below, on the other hand, runs the risk that the cooling emulsion will cool both the shear blade and the orifice ring above it. If the orifice ring gets too cold, the homogeneity of the glass is impaired and, in extreme cases, the glass can actually cool down and set in the orifice ring.

LATEST GENERATION SHEAR SPRAY

GPS has optimised the constant process of lubricating and cooling the shear blades by designing a new spray system with horizontal rather than vertical nozzles that are precisely directed at the axis of the moving shear blades. Horizontal spraying allows the nozzles to be directly integrated in the blades of the new shears. The cooling emulsion is propelled through ducts into the blade arm with the help of compressed air. Each blade is individually connected. The holes for compressed air, oil and water pipes are also located inside the shear blades

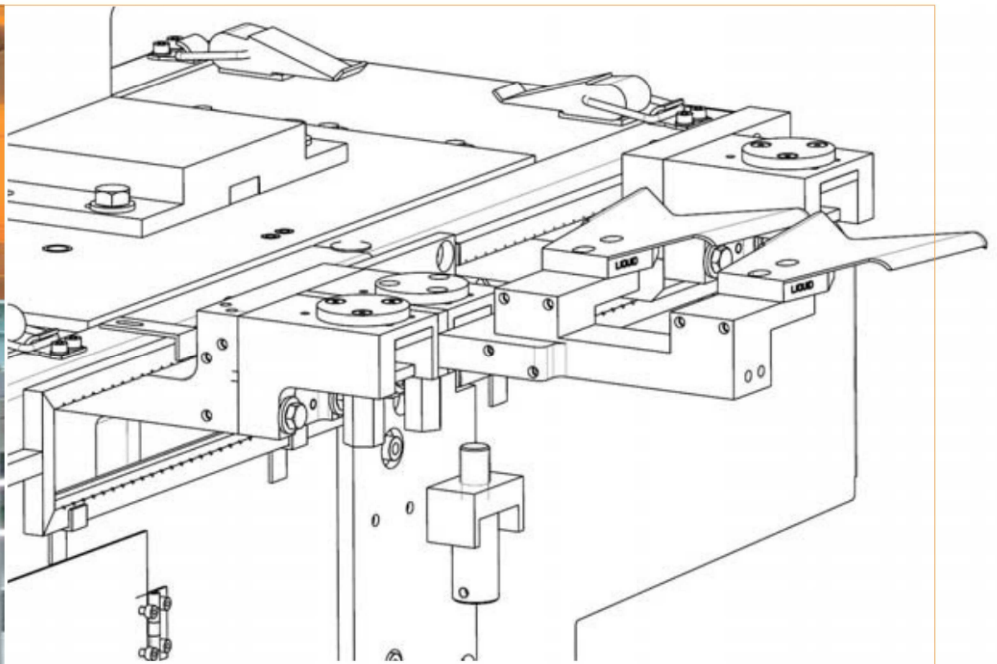


Fig. 2 Schematic drawing of the shear blade holder and arm with integrated spray system for GPS IS machines

the blade, reducing the number of machine stoppages and increasing production process efficiency. The distance between the orifice ring and the shear is also minimised with integrated shear spraying, which increases the precision of the cuts. The glass gobs cannot be inadvertently sprayed with coolant, so they are higher in quality and more suitable for further processing. Overall coolant consumption is also reduced – saving money and improving the ecological footprint. Last, but not least, shear life is extended, which also has a positive impact on the annual result.

ABOUT GPS

GPS is a leading German-based developer and supplier of IS machines catering to the needs of the international container glass manufacturing industry. The specialist company's product portfolio includes IS machines and components, servo mechanisms, feeders and conveyors as well as

control and drive systems for various applications. It also provides consultancy and training services to customers in the container glass manufacturing industry. GPS offers both all-inclusive and modular concepts, because all-inclusive solutions do not always meet the container glass manufacturers' requirements. Sometimes all an IS machine needs is a professional upgrade or the replacement of individual components to achieve improvements in efficiency and product quality. Based on this knowledge and its self-imposed standards of excellence, GPS develops optimum solutions in perfect quality for customers around the globe – at unbeatable value for money. ■

to optimally protect them against heat, dirt and other damage. The nozzles can also be replaced if required.

The advantages at a glance

GPS has raised the state of the art with its new patent. The lubricant and coolant only come into contact with the blade surfaces for just fractions of seconds and also cool the area with maximum precision because the spray system is set at an angle that maximises the efficiency of the spraying process. The orifice ring is able to maintain its temperature and efficiency level throughout the entire shift. The cooling glass does not adhere to



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