



Stirring involvement

Planetary gears from IMS Gear now make ice creams and sorbets even more delicious

This is stirring - in the truest sense of the word: Sophisticated technology from IMS Gear planetary gears modular system now makes ice creams, granitas and sorbets even more delicious. The following article elucidates how IMS Gear makes this happen and why Ugolini SpA relies on planetary gears made in Eisenbach for its machines.



Who does not know the sales stalls on promenades, markets and picnic spots in the South, where fruity granitas, tempting sorbets or delicious slush ice are hawked? Ugolini SpA is one of the leading global manufacturers of machines in which refreshing delights are prepared, cooled and constantly mixed to maintain the optimum consistency. The tasty goods are appetizingly displayed in large containers and are continuously mixed. This prevents excessive frosting or formation of lumps.



This PM 42 is one of the transmission variants which are used within the ice machines.

Exactly the right partner

“For more than 40 years, our family business has been developing and manufacturing machines for preparing and selling sorbets and granitas in the area of Milan,” reports the junior manager Marco Ugolini. When it was decided to offer also machines for slush and dairy ice cream, it quickly became clear that the existing gear solutions were not sufficient: “For a firmer consistency, one requires considerably higher torque to stir the product - and that on a long-term basis. Once the selected gear solutions from other providers failed in test operations, Ugolini came into contact with IMS Gear via the motor manufacturer. “In our association with IMS Gear, we soon realized that it is was just partner we needed for the rapid implementation of our project.”

“Planetary gears (PLG) have the remarkable advantage of high energy density.” This means high torque can be transmitted within small spaces,” explains Heinz Gert Hagedorn, Vice President Sales & Engineering Planetary Gears at IMS Gear. It is precisely this capability that is required in the specific application. The design of the machines is also important: As an

eye-catcher at the point of sale, the machine must also be visually attractive. After all, it must appeal to the eye. Lot of space should thus be available for displaying products for sale and slim dimensions for the required technology. Pointing out the sporty performance requirements, Franco Nacci, IMS Gear sales engineer, says “Specifically, we only had space with a diameter of 42 mm, while at the same time we had high requirements in terms of torque and life-span.”

The reason for the sporty look was that according to the calculations the gear design of a metal planetary gear with a diameter of 52 (PM 52) of the product line IMS.baseline was necessary to fulfill the requirements of torque and stability. Another reason for the sporty design was the prescribed timeframe, which was virtually used up after the failure of the technical implementation that was initially planned. Hagedorn sums up, “At this juncture, the principle of flexible, modular planetary gear system proved to be particularly reliable.” Because instead of the axial screw connection of the PM 52 gear, the design engineers selected the alternative connection via radial pinning, which is possible within the product line IMS.techline.”

This stratagem enabled the designing of a gear housing having an outer diameter reduced to 42 mm, while simultaneously retaining the gearing parts from the PM 52 gear. Moreover, the end shield of the motor was adjusted in such a way that the gear was directly fitted to the motor without additional motor flange. “Finally, we also modified the seal on the motor side, so that we could deliver an operational planetary gear with an outer diameter of 42 mm in large quantities within a few months,” Nacci points out the rapid implementation. And this actually with two different reduction ratios. Because the principle of the modular planetary gear system permits the adaptation of the reduction ratio at any time within a series with four to five different reduction ratios for each gear stage.

Modular gear system

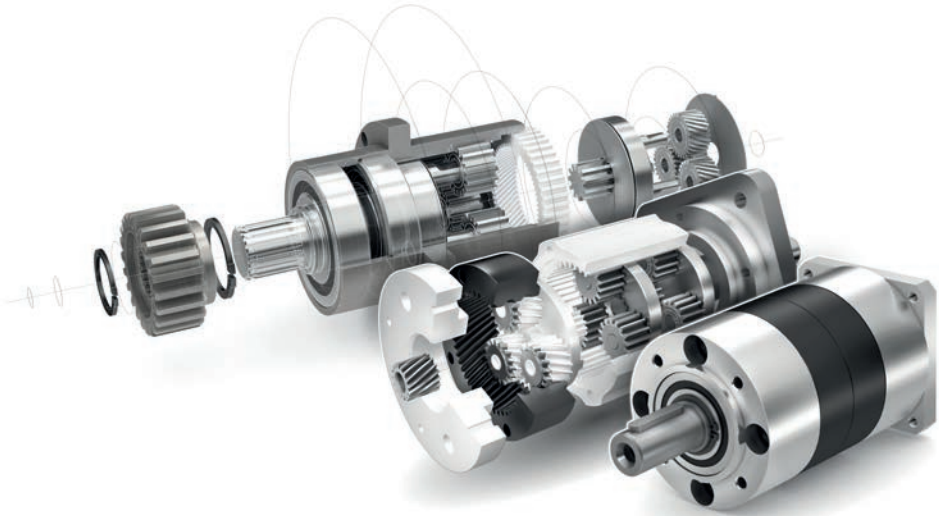
In this first gear version, all three stages were equipped with metal planet gears. Checks after 4500 hours of operating time resulted in virtually no identifiable wear. “Therefore, the prerequisites for the next step towards noise optimization were met,” reports Nacci. Even though for the most part the machines will be standing in busy places where there will be a lot of background noise, explains Marco Ugolini, there is still a growing demand for a quiet operation. This demand is being made so that the machines can also be reliably operated inside buildings.

“At this point, the benefits of the full modular gear system are revealed once again to the customer: Within the IMS.techline, it possesses the variability to replace metal planet gears with those made from plastic, the quality and durability of which have been demonstrated in innumerable test operations and

series applications,” Hagedorn states. In the first stage, where the high rotational speed of the motor directly encounters the gear, the ductile planet gears now ensure for the first gear reduction at an even lower torque. This visibly minimizes the noise level. “The accurate implementation of the gearing in this stage is based on decade-long experience of IMS Gear, combined with the most modern simulation calculations,” Hagedorn emphasizes. In the second and the third stages, the spur metal gears then convert the rotational speed into the torque required. Due to a special bearing technology, these gears are optimized for especially long-term durability even at high torques.



For optimum consistency, the ice cream has to be mixed continuously.



The modular system for planetary gears offers high variability in combination with fast and flexible realization.

„For us, the use of a brushless motor with the sophisticated planetary gear from IMS Gear constitutes an excellent technological solution with which we can optimally process the stirring and circulation process in production and in the dispenser,“ Ugolini is pleased to note. Especially in the production process for ice cream, this combination allows for an unprecedented level of monitoring and control to ensure optimal consistency and texture of the product. “Together with IMS Gear, Ugolini is thus helping the world-famous Italian ice cream to become even more delicious,“ Nacci happily observes.

The use in the high-end devices constitutes the first specific application. The proven stability of the the IMS Gear gears and the slim version is, however, making Ugolini also use planetary gears with modified gear reduction in simpler devices that do not require control systems. “The variability in the modular systems allows for fast and cost-

effective derivations,“ Hagedorn classifies this strategic option for the customer. Ugolini uses this option profitably: On the one hand, one offers high-end products, but at the same time one addresses new market segments. “Because we are using IMS Gear planetary gears, our products are among the slimmest versions in the market,“ Marco Ugolini states a competitive advantage.

Conclusion

Planetary gears from the IMS Gear modular system enable shortest project times, moderate competing goals such as low noise and durability by using superior technology and ensure safe and uncomplicated derivations.