

THE EVOLUTION OF TECHNOLOGY

Keeping up with progress is a must and constant up-dating with current technology is vital for any company.

Electronics, like electricity in its time, improved human life in general: many useful objects, updated by electronics, have become easier to use, lighter, more complete and, in many cases, cheaper. Electronic components look static but have replaced the functions of relays and switches.

Electronics and information technology have created artificial intelligence, giving rise to a myriad of programmes and software to support management, administration, organisation, forecasting and control activities: in our daily life, artificial intelligence is something we can no longer do without.

Electronics and IT are part of every work sector and of life

Mechanics has replaced old lathes and cutters with **computer numerical control (CNC) machines**, which offer centesimal precision while traditional tooling machines had trouble achieving decimal accuracy. **The speed of CNC has driven down manufacturing costs.**

It can be said, without fear of contradiction, that CNC has increased precision and made the interchangeability of many details much easier.

Many housewives have a dishwasher and washing machine, both with a choice of special wash programmes for clothes, cutlery and crockery rather than crystal.

Electrical appliances save water and detergents and respect textiles and tableware.

Discouragement: working today is not easy, we need to keep up with progress, comply with regulations and reduce production costs to foster the distribution of the wealth of goods produced.

When fatigue takes over and we fail at something, we are tempted to stop right there.

Like a cycle race - whoever is in the lead has to maintain it. The benefits of progress are manifold and so evident that they repay all the work which went into it.

Progress in Dentistry

If we look at the transformation of the dental profession over the last few years, there have been many important steps forward: **treatment and prevention have conquered periodontal diseases** and **dental implantology** has been very successful. Implants now allow prosthetic reconstructions which are even more respectful of the remaining teeth and more comfortable for the patient.

Orthodontics for children or pre-prosthetic treatments are now designed and planned on computer using ever more precise and complete software. It seems as if the scanner and cad/cam will soon replace dental impressions and dental mechanics for manufacturing the prosthesis. Obviously, new dental and technical equipment has been designed for this and others will be adapted to meet new requirements.

At the same time, the need was felt to improve dental surgery aspiration: the aim was to give the professional the ability to regulate the suction strength, to control any anomalies in its functioning on a small display, and equip the aspirator with a self-protection mechanism against environmental or power supply disturbances in order to avoid inconvenient temporary stops. These, and other improvements we deemed useful and which we will describe later, have been achieved with the help of modern technologies.

New Technologies: costs and benefits

Updating to new technologies requires time and considerable cost but also offers benefits for the company's image as well as financial and functional benefits relating to the management of the aspirators and compressors in the practice, benefits that certainly are not lost on the careful professional. Here are a few examples:

- • The use of the inverter together with a specific programme offers the ability to regulate the operating head suction, which we advise should be: maximum for surgery, average in preparation for prosthetics and minimal when aspiration is used for the suction of saliva.
- • The programme automatically regulates capacity, increasing and decreasing the speed of rotation of the aspiration unit in relation to demand.
- • During interventions, the aspirator could go into over-current because of the unexpected flow of liquid or overheat because of a temporary obstruction to the ventilation. In both cases, the software adapts the aspirator's operation to deal with the emergency, signals the anomaly on the aspirator display or on the computer (if connected), and once the emergency is resolved, automatically returns to normal function.

Here we have given three examples. If you would like to learn more about the features of our products, please visit our website at www.cattani.it.

Environmental sustainability

Our discussion would not be complete without mentioning environmental sustainability: saving raw materials and energy, results that are achieved only through the application of modern technologies. Here are three examples to explain what we mean.

A practice with two treatment chairs:

- • Turbo-Jet 2 modular is a fixed speed aspirator for two treatment chairs in simultaneous aspiration, weighing 32 Kg.
- Micro-Smart is a variable speed aspirator for two treatment chairs in simultaneous aspiration, weighing 21.5 kg.
- The saving in raw materials achieved with the Micro-Smart compared to the Turbo-Jet 2 modular is 10.5 kg.
- The energy saving is around * 30%.
- These savings are achieved mainly when the aspirator is under-used. The first, fixed speed, aspirator always uses the maximum power, while the second, with variable speed, uses the maximum only when both operators use suction at the same time and with large suction tips; it only uses half power when only one operator uses suction and consumption is also reduced with small diameter suction tips. Power consumption of the variable speed aspirator depends on demand.

A practice with four treatment chairs:

- Turbo HP Quattro is a fixed speed aspirator for 4 treatment chairs in use simultaneously. It weighs 58 Kg and has a constant consumption of between 8.7 A and 9.5 A = (2.09 kW/h),
- Turbo-Smart is a variable speed aspirator for 4 treatment chairs in use simultaneously. It weighs 23 Kg and has a consumption of between 5.8 A and 6.20 A = (1.4 kW/h).

Turbo-Smart saves 11 Kg of raw materials and saves* 0.690 kW/h electricity.

Here is a comparison of larger aspirators:

- A Uni-Jet 1000 fixed speed aspirator unit for 32 treatment chairs in use simultaneously, weighs 155 Kg and has a constant consumption of 13.5 kW/h.
- A Uni-Jet 500 variable speed aspirator unit for 32 treatment chairs in use simultaneously, weighs 88 Kg and has a variable consumption of between 5.7 kW/h and 13.5 kW/h.

With a variable speed aspiration unit, we found a saving in raw materials of 67 Kg and an estimated* power saving of 9.6 kW/h.

New technology allows the same work to be carried out using smaller motors which consume less and therefore achieve significant saving in raw materials and electricity; obviously the savings increase with the larger-sized motors. Also, energy saving are achieved through management and increase over time.

Apart from saving money, we have now know that man's demand for natural resources is higher than the offer, and it has become necessary to reduce consumption otherwise continuing to use more than what nature can reproduce will erode what we leave for future generations.

Our aim has always been to offer a service to the dental profession for whom we have worked for over half a century. With these products, using modern technologies, we have gone much further in the direction of offering a service to mankind as well as to future generations in particular.

If these product have been successful, it is due to the Company's staff that together has rendered research and production possible and special thanks are also due to members of the research team.

Just to be clear, the author of this article is not a member of the research group.

Cattani S.p.A.

* Energy saving has been calculated accurately. The uncertainty and therefore the use of the terms "about" and "estimated" derive from the probability of professionals using small diameter suction tips; our understanding is that professionals mostly use small diameter suction tips as and have therefore divided the time by 50%.

Edition April 2013