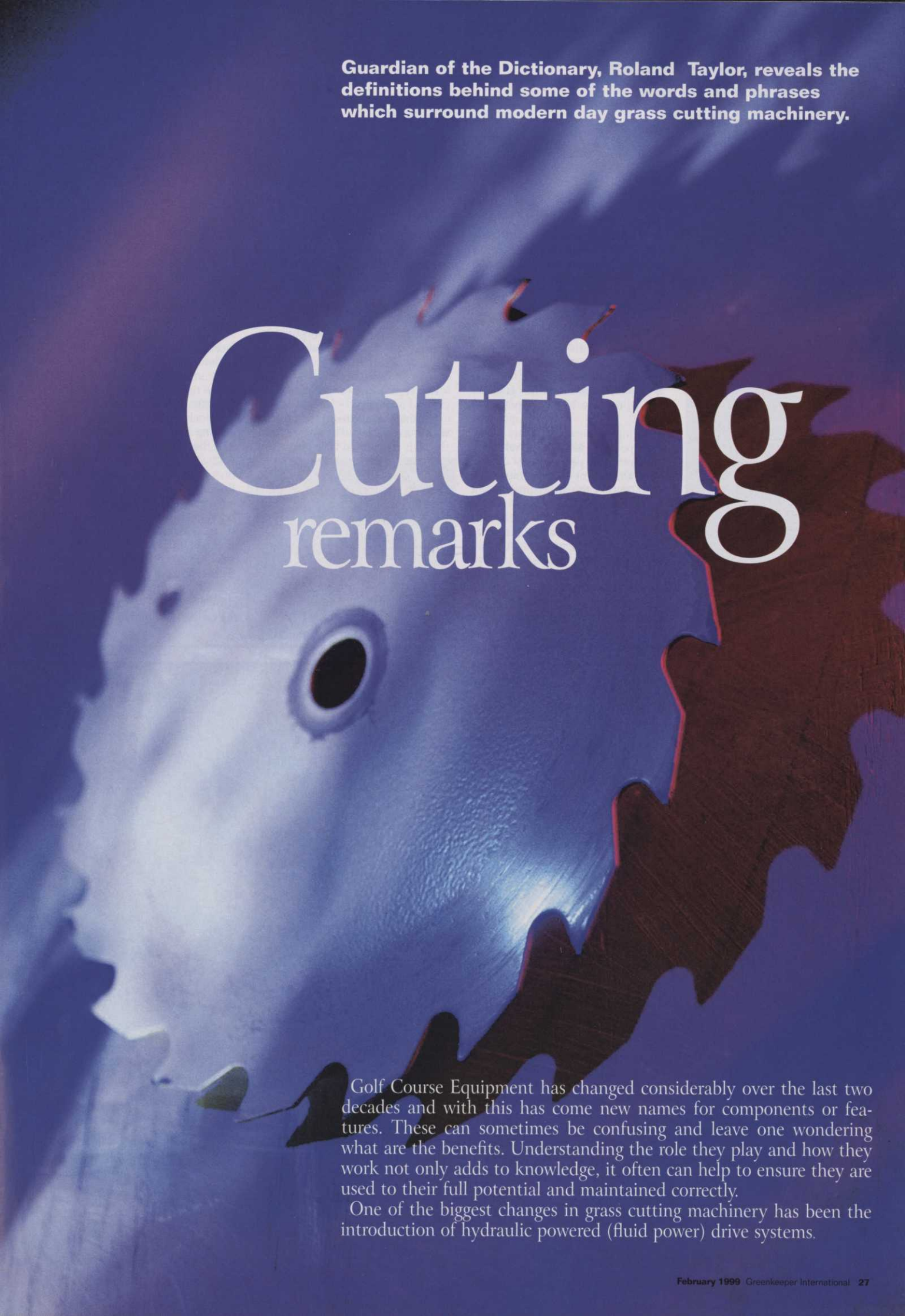
Guardian of the Dictionary, Roland Taylor, reveals the definitions behind some of the words and phrases which surround modern day grass cutting machinery.

Cutting remarks



Golf Course Equipment has changed considerably over the last two decades and with this has come new names for components or features. These can sometimes be confusing and leave one wondering what are the benefits. Understanding the role they play and how they work not only adds to knowledge, it often can help to ensure they are used to their full potential and maintained correctly.

One of the biggest changes in grass cutting machinery has been the introduction of hydraulic powered (fluid power) drive systems.

Cutting remarks

Hydraulic Power

This is a controlled circulation system of a pressurised liquid (in this case oil) to a motor which coverts it to a mechanical output that will work under load.

Hydraulics is the science of fluids in motion and has been harnessed by man for centuries, but it was not until 1650 that French scientist, Pascal, and Swiss physicist Bernoluli, formulated the laws on which today's hydraulic-power is based.

During the next 200 years it was only possible to use the velocities and pressures produced by nature. With the advent of the pump in the 19th century this all changed and in 1882 the City of London had a hydraulic system that delivered pressurised water through the street mains for driving machinery in factories and lifting bridges and hoists.

The next milestone occurred in 1906 when an oil hydraulic system was installed in "USS Virginia" for controlling and raising the guns.

During the 1920's, a self-contained hydraulic unit appeared on the market and opened the way for a host of applications. The rest is history.

The major benefits of hydraulic power is its flexibility and the fact that it produces more output than mechanical and electrical units of an equivalent size. It also responds rapidly and accurately to controls.

Two types of motor are used - linear and rotational.

The linear unit consists of a piston within a cylinder. The energy from the oil is transferred via a piston rod to a mechanical operation such as lifting or lowering. As well as being used on mowers and turf machinery, these hydraulic rams are found extensively in agriculture, aviation and automobiles.

In the case of rotational motors, the pressurised fluid, which is supplied by a hydraulic pump, acts on vanes, gears or pistons within the motor to create a force that produces torque (rotation) to an output shaft.

From this it can be seen that a modern ride-on fairway mower has linear motors to lift or lower cutting units and to provide power steering. The reels and transmission are driven using rotary motors.

There are a number of important factors relating to the care of a hydraulic drive system if it is to work satisfactorily.

The oil flows under considerable pressure, so a lot of heat is generated which needs to be dissipated. A cooling unit is part of the system and this only operates effectively if cold air gets through to it. If the ducting or fins become blocked by dried grass or dust then the oil will overheat and major problems can occur.

The tank has a reservoir to ensure that the correct volume of oil is maintained throughout the system. This level needs to be checked periodically to ensure there is ample oil available.

Bearing in mind that the machin-

ery is often used in a hostile environment, cleanliness is vital to a hydraulic system. Contamination of the oil by water or dirt will have disastrous results with the likelihood of hefty bills.

Other areas to watch are the hoses and especially their couplings. Check to ensure these are secure. It is not much fun being drenched in hot hydraulic fluid, so also make sure that hoses are not chafing against the frame. At any sign of a leakage or damage, replace with new components - the greens are not going to respond very well to a dose of oil, even if it is biodegradable.

Ergonomic design

Another phrase that has appeared in leaflets over the last few years, is 'ergonomic design' - sounds impressive, but exactly what does it mean?

One dictionary describes it as human engineering. In other words the operator's well-being is considered as an integral part of the overall design of a piece of equipment. All the aspects relating to the role he will play are taken into consideration. This is an area that is increasingly important, especially as turfcare machinery becomes more sophisticated and higher productivity is expected.

Ergonomics covers practicalities, efficiency and safety through the careful selection of displays, control layouts, work environment and operator comfort.

The type of features that show a company is using ergonomics as parts of their design are:

- Fully adjustable suspension seats
- Controls within easy reach
- Adjustable steering column
- Weather protection
- Safety features over and above the minimum requirement
- Accessibility for making adjustments or general maintenance
- Driving position with all-round visibility
- Low vibration and noise

In a nutshell what ergonomic design really means is that the operator will feel comfortable using the equipment and fatigue will be reduced to a minimum; as a result, the machine's optimum performance will be achieved.

Ergonomics are now very much a part of modern design, not just a fancy phrase in promotional literature. When it comes to buying equipment, find out exactly the benefits that are on offer under this heading.

Power-to-weight ratio

This is a phrase that is often found in literature on hand-held equipment such as brushcutters and chainsaws. It is the amount of power an engine produces in relation to how heavy it is.

To reduce weight and increase engine output without sacrificing quality is not easy, but with modern materials and changes in design an engine that is lightweight with plenty of power is achievable. Where hand-held equipment is going to being used for long periods at a time power-to-weight together with exhaust emissions, vibration and noise levels need to be taken into account.

Over the last two decades lots of beneficial changes have taken place to improve golf course machinery and the greenkeeper has had to adapt to using a new breed of equipment and become accustomed to the appropriate jargon. Technology is moving fast - already computers are becoming part of a greenkeeper's equipment, especially in the field of irrigation. Diagnostic modules are appearing on machines and engine management systems will soon be the norm. There are probably a host of new introductions about to appear in the next millennium.

The learning curve could be enormous, so it is up to each and every one of us to seek out any information that keeps us abreast of developments and the modern language that is likely to go with it.