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HM Today

HOLLAND MECHANICS

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Wheels as a Distinguished Component

Bicycle wheels today are components of distinction. Over the past century, rims, hubs and tyres could add to the sporty image, the suggested sturdiness, a touch of nobility... Today's possibilities are even more extended. Low rims versus high rims, polished or anodized, coloured, rims with brake surfaces or wheels with hub brakes, coloured tyres, stickers (the high rim side flange or even the aero spoke are a smart billboard). And, of course, the spoke pattern. For more than a century it has been crosswise, and double-sided, i.e. two mirror-image spoke screens on both sides of the wheel. Since Rolf Dietrich conceived his first wheelset with spokes emerging from the left and right sides of the hub and meeting at the same spot on the rim, countless variations have been developed for branded wheelsets, like Vuelta, Campagnolo, Mavic, Alex, Formula, Bontrager, Rigida or Shimano. Some are very basic, others may give excellent results in stiffness and resilience of the wheel, but have a derived pattern without real structural advantage. Nevertheless, customers of high-end bicycles have discovered the visual attractiveness of the odd spoke pattern: buy it, and show your friends.

The visual differences in the spoke pattern of these fashionable wheelsets created specific problems for the wheelbuilders: some require up to four different spoke lengths, and the tensioning becomes quite a problem when two spokes with their nipples at nearly the same spot of the rim face in the same direction. Tensioning the first, often means that the second looses tension in the same action. Tensioning two at a time is an impossible job by hand, but a quite normal setup for a tensioning machine. Today's wheelbuilder needs versatile machinery to cope with today's fashion. Every wheel as a separate job, with its own rim size, number of spokes, low or high rim, symmetrical or asymmetrical, spoke pattern, crossings. 28" wheels with 36 spokes, 26" wheels with 32, 28, 24, 22, 18 or 16 spokes, 24" wheels and smaller: The only condition of Paired Spoke Technology wheels is that the spoke tension must be secured by a thread locking compound which fixates the nipple on the spoke. Today's sophisticated hub fillers, lacing machines, stabilizers with QLock applicator and intelligent trueing machines can help you build nearly all the wheels a bike designer can conceive.

Spoke tensions today may be up to three times higher than the traditional wheel of 25 years ago. That is a result of stronger spoke material, tighter tolerances in the hub holes, stronger hub flanges, better rims, better nipples and better control of the tightening torques. Traditional lacing measures the roundness (vs. ovality) of the wheel, and the lateral tolerance. But to get a view of the quality of the wheel, the primary value of the spoke tension is a much better instrument. A straight wheel within the dimensional tolerances may show up a spread in spoke tensions of 50% or more. The same wheel can be made with a spread of less than 10%, but this is only possible with a trueing machine in which the dimensional tolerances and the spoke tension are control parameters. Measuring the complete set of spoke tensions as part of the wheelbuilding sequence is a reality, with inline tension measuring for every wheel or batch control.

Wheelbuilding machinery is not only much faster than lacing and trueing by hand, its main advantages are that the product is far more consistent, and that spoke patterns which were difficult to spoke by hand have become easier with the assistance of the machinery.

Even in countries where manual labour is very cheap, it makes sense to consider mechanizing your wheelshop. Why? Because the mechanically trued wheel is consistent, and the quality of the wheel can be made plausible in case of liability. In the EU market, in the USA and in Japan, the producer of a consumer product (for instance, a bicycle) is held liable for production failures. When proof is required, a wheel from a mechanized wheelbuilding line with a traceable wheel identification is a much safer starting point for the bicycle manufacturer.

The changing look of Holland Mechanics

Transformation of

HOLLAND MECHANICS

the old logo

HOLLAND MECHANICS

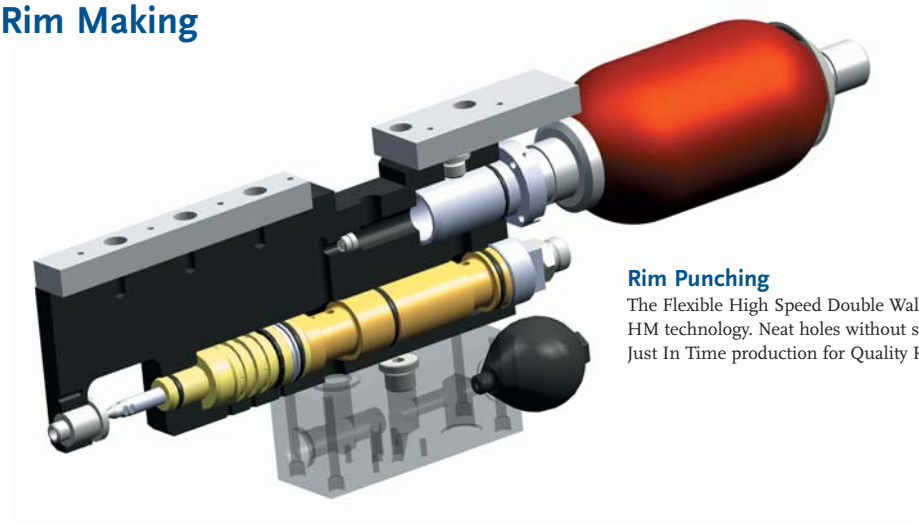
into the new logo

HOLLAND MECHANICS

Holland Mechanics asked Design Studio Hans Lemmens to update and optimise its logotype and housestyle which served the company already for several years. The briefing to the designer was that the new house style should reflect and express a number of things, at the same time keeping a strong link with the past. Key words to help define the desired adapted look were: wheels, hi-tech, modern, 21st century, reliability, partnerships, market leadership.
Holland Mechanics thinks that its new logo which is shown above has the quality to keep its up-to-date look for at least the next ten years.

Special Wheels

Rim Making

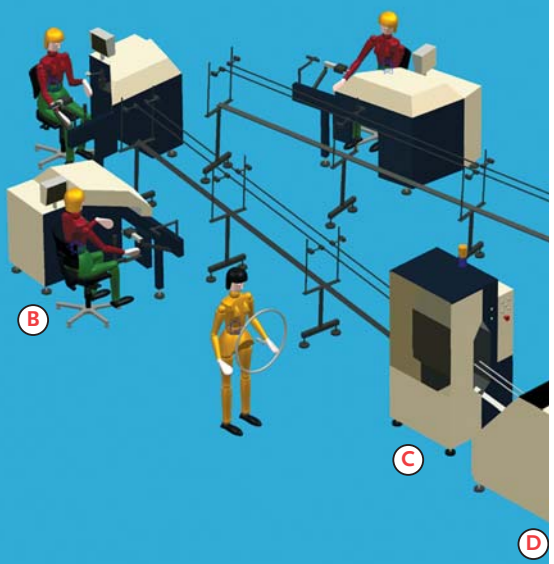


Rim Punching
The Flexible High Speed Double Wall Punching machine is a patented HM technology. Neat holes without shavings and no flushing needed. Just In Time production for Quality Rims.

Rim Rolling
Rolls the profile automatically into a spiral for three rims.

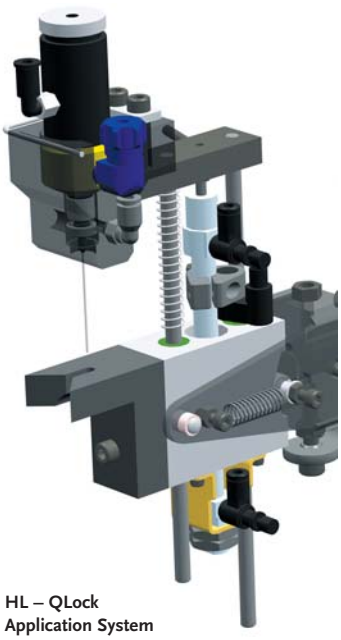
Rim Assembly
Cutting and Pinning in one operation. Three rims at one time.

Wheelbuilding



A Hub Filling System
HFS: Automatic Hub Filling System which inserts 36 spokes within 30 seconds. PST Wheels with four different spoke lengths can easily be filled on the HFS because it is equipped with 4 Spoke containers for 4 different spoke groups.

B Lacing & Tightening ISL PST
The newest ISL PST with improved camera system for precise scanning of nipple holes. All wheels with difficult PST (Paired Spoke Technology) and normal spoke patterns can be scanned, laced and tightened in one operation. Flexibility and variety; the ISL changes over automatically from 16" till 28" within seconds.



HL – QLock Application System

NWF – Nipple Washer Feeding system
Feeds automatically a HM QLet or a standard washer between the nipple and the rimbed.

C Quality Application Systems

HB – Stabilizer
Improved "seating" of the nipple in the rim and the spoke neck at the hub flange. Stronger spoke neck and reduced loss in spoke tension by 30 percent.

HL – QLock Application System
Final spoke tension can be secured by using automatic dosing system with QLock thread locking compound

HT – QTape Application System
Automatic assembly of light self adhesive Rimtape which is always in the center of the rim bed, covering the spoke holes or nipple heads.

D Trueing Robot SG Touch Screen
The Robot Second Generation TS is not only user friendly because of its Touch Screen interface but it can also true fully automatic all difficult spoke patterns because the advanced software runs on the internal Pentium 4 processor.

WID – Wheel Identification
Automatic Identification of wheel types with their unique spoke patterns. WID is a recommended option for customers who are assembling PST wheels or other specials.

One Hand Trueing
Wheel designs with a very narrow spoke pitch can be trued by one hand.
Automatic scanning and storing of wheels with barcode labels.

Special Attention

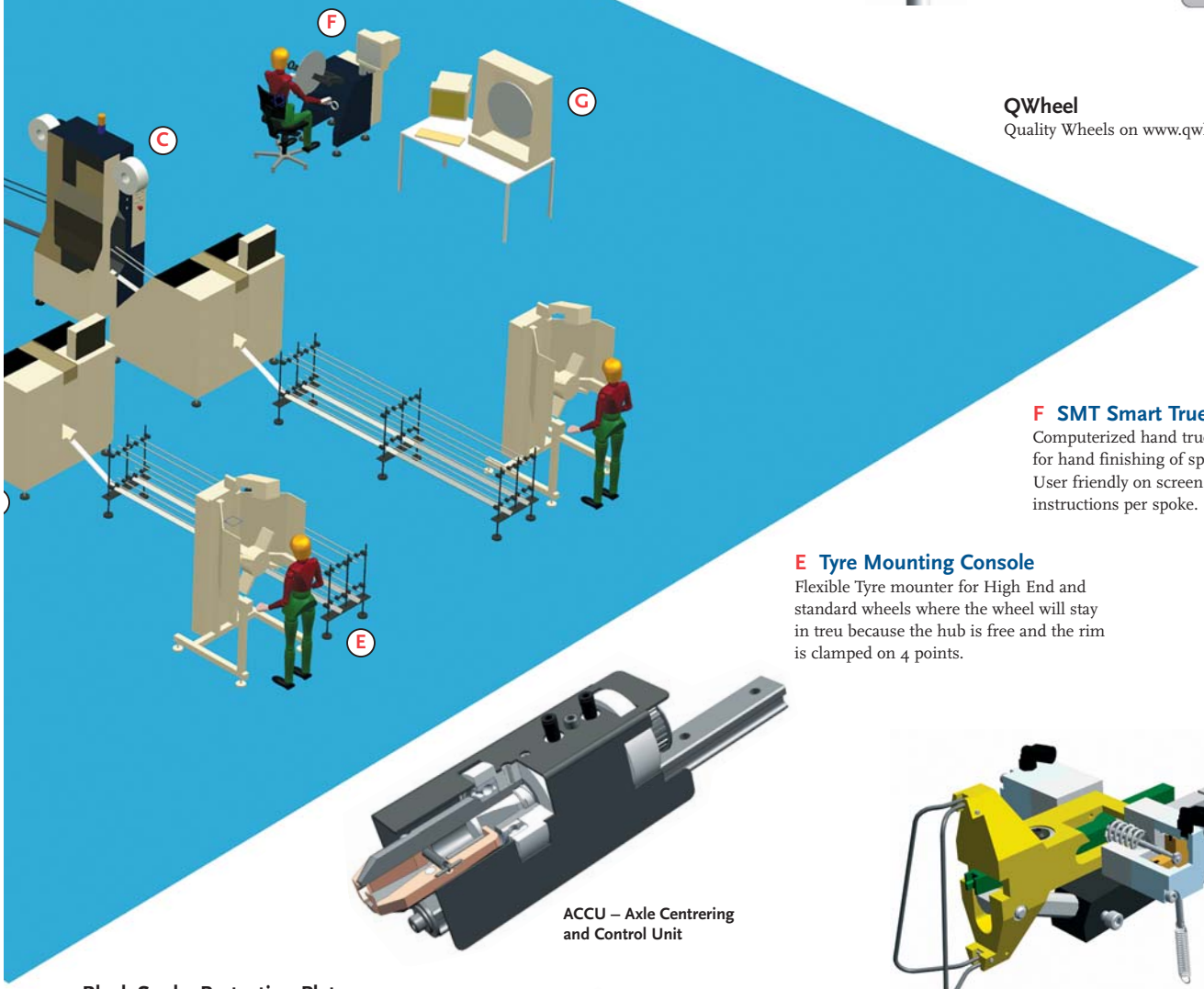
Q-Corner

QLets
Special developed nipple washer for Low resistance & Equal Tensioning.

QTape
Self-adhesive weight saving rim-tape. Always in place. Ultra light and strong.

QLock
Thread Locking Compound which prevents the nipple from loosening.

QWheel
Quality Wheels on www.qwheel.com



F SMT Smart Truer
Computerized hand trueing machine for hand finishing of special wheels. User friendly on screen trueing instructions per spoke.

E Tyre Mounting Console
Flexible Tyre mounter for High End and standard wheels where the wheel will stay in treu because the hub is free and the rim is clamped on 4 points.

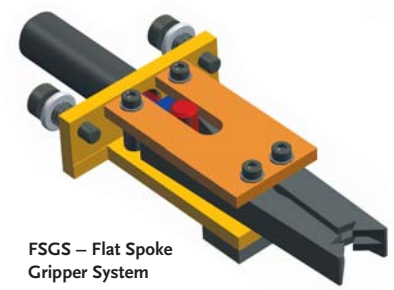
ACCU – Axle Centrering and Control Unit

Black Spoke Protection Plates
Prevents scratches on Black Spokes

ACCU – Axle Centrering and Control Unit
Special hub clamps which measures the bending of the axle and makes corrections in the trueing process.

Track & Trace
Automatic scanning and storing of wheels with barcode labels.

FSGS – Flat Spoke Gripper System
Prevents wind-up in flat spokes



FSGS – Flat Spoke Gripper System

G Tensiomatic
Automatic tension measuring device connected to the trueing Robot SG TS. Can be placed inline in front of the Robot for controlled tension trueing and after the Robot for controlling final tensions (Track & Trace).

The rim: punched vs drilled spoke holes

Drilling has always been the most obvious way to make spoke holes in a double wall rim, but punching has certain advantages. For a start, punched holes give a stronger rim. Why? Because part of the material is removed in the form of the pellet, but the material immediately around the hole is forged as a hardened wall around. Compared to a drilled hole, this 'finishing' of the hole is far more shear-proof than the drilled hole. With today's trend towards spoke pattern variations the HM punching machine can cope with all of them in a very efficient and flexible way. Holland Mechanics has developed a patented system called High Speed Punching which gives particularly neat holes without cracks. A second advantage of High Speed Punching is that there are no shavings. It is a well-known problem that the shavings (sometimes mixed with the cutting oil) of conventional punching and drilling methods hide inside the double wall rim. Extensive flushing is needed to clean the rim, but even then the 'dishwashing brush' can't reach all of it.

right rim: High Speed Punched rim (patented by HM)

Trued, Glued, Qu'ed

At Holland Mechanics, trueing wheels has always been our business. But besides lacing (in any pattern) and trueing, we strongly advocate additional measures to prolong the life cycle of the wheel, and improve the quality. Our Q-series of Quality modules includes Q-Lock, a module to give each spoke nipple a tiny droplet of locking compound to prevent slackening of the spokes in wheels intended for a heavy-duty life. Another Q-module is the automatic application of rim tape. The Q-Tape saves time (putting on a ultra light rim tape at the end of the assembly line, takes more than 'a few' seconds, each time again, centering the hole over the valve hole in the rim, and checking that the tape effectively covers all nipple ends properly. A third quality module we are currently developing, are

QLets

QLets are washer or o-rings between the nipple head and the rim. It is a well-known problem that the different hardness of the nipple material and the rim material may cause biting. The transverse slot machined in the nipple head may even act as a chisel in the rim material. The trueing torque is intended to increase the tension of the spoke, and is partially lost in the biting between nipple head and rim. Biting results in unequal spoke tensions within the wheel.

This problem has been known for a long time (even before wheels were trued mechanically, it is as old as the aluminium rim). A recognized 'therapy' is the application of eyelets in the rim, which guide the nipple heads. An intrinsic drawback of eyelets is that the rim need slightly larger holes, which weakens the rim This is not just theory: rims with eyelets are relatively often showing cracks in the plane of the wheel. Spoke makers in turn have sophisticated the head profile and finish of their nipples. Holland Mechanics have developed the QLet, were LET stands for Low resistance & Equal Tensioning. The QLets are tiny, conical rundles between the nipple heads and the rim. The QLets have a special coating which results in low resistance on the nipple during the trueing and tightening process. The construction is such, that the pulling force of the tensioned spoke does not 'push out' the material of the QLet, and the coating lets the nipple turn with a minimum of friction. The application of the QLets permits the wheeltruer an effective 1/3 increase of the spoke tension. Applying the QLets is not much of a problem, it is automatically feeded into lacing machine.

Agenda

Wheels and Impact

Why lock spoke nipples? Various manufacturers of spokes and nipples each have found methods to prevent spoke nipples to unscrew themselves. Some lock the nipple with a pre-applied locking compound, others have a plastic insert in the nipple (like a self-locking nut in construction work). Holland Mechanics offers a sytem which applies a tiny droplet of locking compound on each nipple along the line between lacer and trueing machine.
But when will the nipple unscrew? The answer is: every time the tension on the spoke is relieved. In principle, this never happens. For a race wheel on a track bike that only rides on a polished wooden surface, the slackening of spoke nipples is theory. But for a bicycle in everyday use, taking the bumps means relieving the tension of one or two spokes, just a split second on the moment one hits the curbstone with the front wheel, or drops the rear wheel from the sidewalk, with a loaded bike. When the bump is such that it hits the rim (through the pressure of the tire), the rim undergoes the tiniest deformation, say 7/100 of a millimetre, for 1/10 of a second, and completely within the elasticity of the rim itself. No permanent damage, it seems. But the nipple has unscrewed itself a few degrees. And so on. Bike wheels in daily use take the beating. Bike wheels with locked nipples have a longer average life.

Funny thing: 50 years ago, a rear wheel had 40 spokes. The next generation had 36 spokes (better materials, standardization of both wheels on one bike, one type of rim in stock). If a wheel broke down, the remedy was often to use thicker gauge repair spokes. Today's standard for a 26" wheel is 32 spokes (better materials, just discard a broken wheel, or the complete bike when it is sloppy). During the same 50 years, the average lenght and weight of the people in most developed countries has increased considerably- Not only in the 'States the average went up. Men and women weighing in at 100 kilos or more are no rarity. They buy bicycles, just like you and me. Well, you say, better materials will bear them. How about a 100 kg-plus lad on a bike hitting the road carelessly?

Bicycle dealers should advise their manufacturers strongly to supply 40-spoke wheels as an option for heavy-weight people. Locked spokes should be standard on every bicycle for heavy-duty.