MEDIA RELEASE

PENNY + GILES SOLENOIDS CLEAR THE LANES FOR TEN-PIN BOWLING

Cwmfelinfach, UK – 4th May, 2011 – There are more than 200 tenpin bowling centres in the UK, averaging 24 lanes per centre. These include chains such as First Bowl, AMF and Hollywood Bowl; independents and many British and American military bases.

Penny + Giles Controls, a business unit of Curtiss-Wright Controls and designer and manufacturer of high precision joysticks, sensors and solenoids, has developed a number of bespoke solenoids to activate and control the specialised machinery that cleans and oils the busy lanes in tenpin bowling centres throughout the UK and Europe.

The solenoids are manufactured for Canterbury-based Embassy Services, a company that specialises in the servicing, repair and refurbishment of tenpin bowling machinery, which is predominately supplied from the USA.

Whilst laminate has replaced traditional timber as the material of choice for bowling lanes, they are still oiled with a special low-friction lubricant to help protect the surface and control the path of the ball as Stuart Munnings of Embassy Services explains: "If it is thrown properly a bowling ball is spinning when it leaves the hand. No matter how fast it is spinning, the ball will slide through the first heavily-oiled twenty feet of the lane. It then has a degree of guidance in the middle section where the oil is shaped and tapered, before reaching the final section, at which stage the lane is almost dry because the oil has been stripped off. At this point stored energy in the ball is released, creating the correct hooking action on the bowling lane."

He adds: "Game play can be significantly affected by the length and depth of the coating applied to the lane, hence the need for the development of an accurate and reliable solenoid to ensure that the machine correctly controls the flow and shape the oil."

During tournaments, officials measure the amount of oil used to ensure that it meets strict rules governing both the amount applied, and to what portion of the lane it is applied. The more games played on the lane the more the oil degrades so the oiling machine is usually employed twice a day in reasonably busy centres and up to ten times a day during tournaments.

The wheel-mounted machines begin their 3-stage process at the bowler's end of the lane, where a cleaning head applies a detergent to convert the degraded coating of oil into an emulsion. This is then removed by a vacuum head and the machine begins to deposit a new coating of oil, which is built up in layers by moving the machine up and down the bowling lane. When the process is completed the machine is moved to the next lane. Typically, a machine takes 30 to 60 seconds to strip and oil an entire bowling lane.

As well as controlling the supply of oil and lowering the buffing brushes and cleaning vacuum heads to the lane prior to the application of each new coating, the Penny + Giles solenoids also play an important role in shaping and tapering the finished coating.

In total, twelve solenoids are fitted to each machine. A pair of larger Penny + Giles solenoids is connected to cantilevers to raise and lower the three heads that individually operate the cleaning, vacuuming and oiling functions. Control of the six oil tanks fitted to each machine is operated by smaller Penny + Giles solenoids.

Based on their positive experience with the solenoids developed for the cleaning and oiling machines, Embassy Services invited Penny + Giles to develop a robust, accurate and reliable solenoid that is an integral part of the complex pinspotter mechanism, which operates in what is arguably the most arduous environment in a bowling centre.

Pinspotter mechanisms are used to assemble and place the ten pins upright onto the lane surface, register the first bowled ball, and sweep away the fallen pins after picking up the remaining standing pins. Swept pins are automatically lifted inside the machine, sorted and placed, ready to be 'spotted' for the next game by a table mechanism on the lane. The table is moved to one of two different heights by the specially developed Penny + Giles solenoids, which are either engaged or disengaged.

The solenoid that the Penny + Giles unit replaces was an upgraded version of an archaic US-manufactured component, which was dual 50/60 Hertz and tended to run very hot in a bowling centre environment, making them very unreliable. Various alternatives were developed by manufacturers in Europe – some with oversized heat sinks, others with various coatings to try to dissipate the heat, but not one of them was fit for purpose or particularly successful.

Commenting for Embassy Services, Stuart Munnings says: "The solenoids had become unnecessarily complicated over the years, but fortunately, when we invited Penny + Giles to look at the problem they very quickly produced a thoroughly developed product that we were able to use straight away, which is impressive when you consider that typical US bowling

equipment is based on 40 year-old technology. Their engineers are very knowledgeable regarding the electro magnetic fields (EMF) that can be generated within the solenoids."

He adds that it was refreshing to find a company in the UK that would work with them to develop a product specifically for the application and says that Penny + Giles worked very closely with them and provided a lot of very good feedback and technical help, which is a rarity these days.

The solenoid developed by Penny + Giles was wound specifically for the pinspotter machine's Hertz/voltage requirement which also means that reliability and general performance is greatly improved.

The solenoid is mounted on the machine using a laser-cut bracket, which positions it accurately for operation.

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Editors note:
Embassy Services is an independent family business providing spare parts and specialised services to the bowling industry, with experience in both technical and training services. Its extensive workshop facility includes a dedicated motor repair shop and lane equipment refurbishment and testing area, with the capability to service, upgrade and repair a wide range of bowling equipment. The company stocks a range of AMF pinspotter spares and upgrades and also holds used lane machines that can be refurbished to factory standards, and upgraded to the most modern standards from a large stock of lane machine parts.

For press information contact:
Simon Cantillion, Cantillion King Advertising
16 The Cornhill, Stroud, Gloucestershire, GL5 2JT, United Kingdom.
Tel: +44 (0)1453 755551 Fax: +44 (0)1453 751525
E-mail: simon@cka.co.uk Web: www.cka.co.uk

For further information, sales and reader service enquiries contact:
Mike Iles, Business Development Manager, Penny + Giles Controls Ltd
15 Airfield Road, Christchurch, Dorset, BH23 3TG, United Kingdom.
Tel: +44 (0)1202 409409, Email: mike.iles@pennyandgiles.com Web: www.pennyandgiles.com

For editorial information regarding Curtiss-Wright Controls products or services contact:
John Wranovics, Director of Public Relations
Curtiss-Wright Controls Embedded Computing, Tel: (925) 640-6402
Email: jwranovics@curtisswright.com Web: www.cwcembedded.com

About Curtiss-Wright Controls Integrated Sensing, Penny + Giles
Penny + Giles is a global leader in the design and manufacture of specialist position sensors, solenoids and control hardware for industrial and defence markets. Headquartered in Christchurch, Dorset, United Kingdom, Penny + Giles is part of Curtiss-Wright Controls Integrated Sensing, a business unit of Curtiss-Wright Controls, Inc. For more information visit www.pennyandgiles.com.

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Headquartered in Charlotte, N.C., Curtiss-Wright Controls is the motion control segment of Curtiss-Wright Corporation (NYSE: CW). With manufacturing facilities around the world, Curtiss-Wright Controls is a leading technology-based organization providing niche motion control products, subsystems and services internationally for the aerospace and defence markets. For more information visit www.cwcontrols.com.