Technical Details

- 14.4 volt battery
- Forward / Reverse control
- Variable Torque Control
- Accommodates tool bits up to 100mm in length by 10mm in diameter
- 500rpm no load speed
- 7Nm Torque at chuck
- Stores four tools internally in magazine
- Uses tools with standard hexagon fitting

Note: - Larger or smaller versions can be produced as required.

The *Multi-bit Drill*

The *Multi-bit Drill* has a unique internal mechanism that allows a variety of tool bits, drills, countersinks, screwdriver bits etc. to be simultaneously loaded into a magazine within the drill. A loading mechanism moves each bit into place as selected. This feature is in addition to the usual torque limiting devices, and variable speed controls normally associated with portable drills.

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Patent applied for.

1995-01/06-CMP

Why is it needed?

The *Multi-bit Drill* has been designed to make peoples lives easier when doing DIY tasks by:

- Eliminating the need to have a drill and a cordless screwdriver. Even with both these you may still be changing over tool bits.
- Allowing tasks to be done more easily in places where changing tools or putting tools down is awkward, i.e. up a ladder or on the roof, and eliminating the chance of dropping the tool bits.
- Locating the tool bits you require all in one place.
- Providing for fast changeover times between bits.

Who is it for?

It has been designed for the DIY and professional markets where users can get frustrated by having to repeatedly swap between tool bits. It would be suited to shop fitting work, assembly or light building work. The loading system could also be easily modified to take larger tool bits and a more powerful motor, making it suitable for the heavier building site environment.

How does it work?

The drill has a rotary magazine inside which can hold four tool bits. A slot just in front of the trigger allows the operator, using their finger, to turn the magazine round. To select a tool the magazine is rotated until the desired tool is visible in the top window. Windows either side allow the user to see where the tools are. The magazine can then be turned in either direction for quick loading.

To load the selected tool, two buttons, one each side of the casing are pushed forward. This pushes the selected tool down the internal magazine and automatically engages it into the chuck. When the buttons reach the furthest forward position they lock in place, securing the tool bit in the chuck ready for use.

Once the drill is loaded the operation is the same as any other drill. A trigger controls the on or off, and this can be fitted with a variable speed function. A slider above the trigger handles the forward and reverse functions, and torque control is provided by a ring below the magazine. See labelled Diagram overleaf.

To unload the tool the two buttons are squeezed inward slightly, keeping this position applies enough pressure for the buttons to be pulled back to the home position. The squeezing action combined with the action of pulling the tool bit back is what unlocks the tool bit from the chuck, the operation is then repeated as required.

To change damaged or broken tools or just to load a different set of tools, part of the magazine can be ejected through a door in the rear. The cartridge can either be swapped with a second cartridge containing a totally new set of tool bits or individual tools can be unclipped and replaced. The cartridge is then replaced and the door shut.

Who has developed it?

Design and development work was completed by Loftus Hall, a final year student in Product Design at Bournemouth University. The design was demonstrated to the public in June 2005 at the University's annual Festival of Design and Innovation.

The *Multi-bit Drill* was also awarded the James Dyson Foundation Award for Product Design at New Designers (Part 2), the UK's leading graduate design show. (www.dec.bournemouth.ac.uk/news270705)

Features and Benefits

- Loads and unloads simply using a slider on the casing.
- Rear door allows individual tools to be changed, or different magazines to be swapped easily and quickly.
- Changing mechanism saves time and reduces fiddly tool changes.