

## About Knitting Machines

Domestic knitting machines have been around for many years and have been popular since the 1950's. They have been available in a number of different gauges to suit different thicknesses of yarn. They are often termed either as "Japanese" or "European", by style as well as by place of manufacturer.

A lot of the early makes of machine companies have disappeared, sometimes because they were incorporated into the larger manufacturers but also because they did not continue to develop their range of machines in the way that the remaining companies did.

Japanese machines have been manufactured by Brother, Silver Reed and Toyota, and have been badged differently for markets around the world. They can be called Jones, Empisal, Knitmaster, Knit King, White, Singer and various other names. The Empisal brand was used for different machines in different countries. These machines were supplied as a single bed of needles with the option to add an additional bed of needles (a ribber). The early machines were what are now known as standard gauge with additional gauges added over the years.

European machines were made by Passap, Pfaff and Singer, sometimes known as Superba and different from the Singer badged machines made in Japan. These machines were usually two beds of needles fixed together, although they did make single bed machines as well. The needles on these machines are usually 5 mm apart.

Silver Reed is currently the main company producing machines and importing them into the UK. (There is a good second hand market for most makes and more information is available elsewhere about buying a second hand machine.)

The gauge is the taken from the centre of one needle to the centre of the adjacent needle. The machines work best in the middle of their tension range which is usually adjusted by means of a tension dial on the carriage. If yarn is knitted at the wrong tension it will make the resulting knitting either too stiff or too loose and holey.

Fine Gauge	Needles are 3.5 mm or 3.6 mm apart and equate to 7 gauge. They knit yarns up to and including 3 ply and some fine 4 ply yarns. These machines can be difficult to find as there weren't as many sold.
Standard gauge	Needles are 4.5 mm apart, 5.6 gauge. They knit yarns up to and including 4 ply and some fine double knit yarns. These machines are the most popular.
Mid-gauge	Needles are 6 mm or 7 mm apart, approx. 3.9 gauge and work well with DK yarns, including hand knit yarns. These machines often have plastic beds and limited patterning facilities.
Chunky gauge	Needles are 9 mm apart, 2.8 gauge and knit the DK, aran and light chunky weight yarns.

It is possible to knit some thicker yarns on every alternate needle, but this will reduce the width of the fabric produced. It can also create additional problems if the yarn won't fit into the hook of the needle and allow the latch to close over it.

### **Patterning:**

There are a number of different methods of selecting the needles for the patterning on knitting machines. Buttons, knobs and levers on the carriage are moved to different positions in order to make the stitch pattern, plus needles are left out of work and different yarns are used to create the different stitches – tuck, slip, fairisle, thread/punchlace lace, tuck lace, knitweave etc.

The main methods of needle selection are:

**Manual patterning:** needles are selected by hand.

**Push Button patterning:** buttons are pressed and a handle cranked to select needles as required for every row of pattern on Brother and Toyota machines. Knitmaster machines have the buttons on the carriage and also require needles to be selected for one repeat of the pattern.

**Punchcard patterning:** needles are selected by the machine according to the pattern punched on a card which is inserted into the card reader. Usually 24 stitch repeat, but some models were 12 or 18 stitch repeat. Fine gauge machines are usually 30 stitch repeat.

**Electronic patterning:** needles are selected by the machine according to a pattern loaded into the computer memory of the machine which can contain up to 700 patterns. The patterns can be up to 200 stitches wide (depending on model of machine). Patterns can also be flipped, rotated and doubled in length and width. Parts of the pattern can be isolated to create new patterns. Some machines read patterns from mylar sheets or external reader boxes. It is also possible to connect some machines to a computer and input the pattern directly. There may also be a slot for a pattern cartridge which contains additional patterns.

Casting on and off and shaping are done by hand, and the carriage is moved by hand. Additional stitch patterns such as cables and bobbles can also be worked by hand.

Machines can have plastic or metal beds. Plastic bed Japanese machines are usually more basic and they do not have ribbers available. Bond/USM machines are also plastic bed machines. The European machines are usually considered to be more complicated than the Japanese machines

### Optional accessories:

#### **Ribber**

Except for the very early machines it should be possible to buy a ribber for most Japanese metal bed machines. This is a separate bed of needles that fits onto the front of the main bed to create a double bed machine. With a ribber it is possible to create various ribs, tuck ribs, raked ribs and double jacquard patterns. The ribber has limited patterning capability with most of the patterning being done on the main bed. It is also possible to knit circular or U pieces by adjusting the controls.

#### **Motors**

Motors are available for some machines. They are either mounted on a rail above or behind the machine or at the right hand end of the machine, depending on the type of motor and the machine that it is fixed to. The motor only pass the carriage from side to side. It does not shape the knitting.

#### **Lace Carriage**

Some Japanese machines come with a lace carriage or they can be purchased separately. Lace carriages work by bending two needles together to transfer a stitch. Brother/Toyota machines work by using a lace carriage to transfer the stitches and the main carriage to knit the rows. Silver Reed/Knitmaster use a separate carriage that transfers the stitches and knits at the same time. Chunky gauge machines do not have lace carriages.

Double bed machines make a form of lace by transferring stitches between the two beds of needles. The Passap transfer attachment can be used to create lace.

Machines without a lace carriage or facility can still be used to create lace by manually manipulating the stitches (hand transfer) before knitting the row.

#### **Garter Carriage**

Available for some Brother standard gauge machines only, a garter carriage is a separate electrical device that sits on the machine bed and creates plain and purl stitches as it "walks" along. It is not possible to have needles in upper working or holding position when the garter carriage is in use, so different methods have to be used when shaping is required. It is slow.

**Cast off Linker**

As the name implies – used to cast off the stitches when the piece has been knitted. It can also be used when join pieces of knitting together on the knitting machine. Most only work in one direction.

**Transfer Carriage**

Used to transfer stitches from the ribber bed to the main bed on Japanese machines. There is also an attachment for Passap machines which transfers stitches from one bed to the other.

**Intarsia Carriage**

Some machines have a facility to knit intarsia already built into the carriage, others require a separate carriage. Both mean that the needles return to upper working position and so the hooks of the needles are outside the sinker or gate pegs and in a position where yarns can be hand laid into the hooks of the needles prior to passing the carriage to knit the stitch.

**Colour Changer**

Available for most models of machine, the colour changer enables the yarn in the feeder to be changed more easily than doing it by hand.

**Garter bar**

Available for standard and chunky gauge Japanese machines, they are long “combs” that hold the stitches from the needles so that the whole piece of knitting can be turned around and rehung onto the needles.

[www.guild-mach-knit.org.uk](http://www.guild-mach-knit.org.uk)