

Making "John Bull" Tyres

Control is the Key to Quality at the Evington Valley Mills, Leicester. Visit Reported by H. H. ENGLAND

TREVOR LAKER was a technical journalist before he joined the John Bull Rubber Co., Ltd., of which concern he is now the Sales Director. I mention his name not only because he gave me a personal and warm welcome to Leicester when I visited the John Bull factory recently, but also to tell my readers of the interesting fact that he is the proud owner of the car with the registration mark A1.

That is a suitable symbol to start the story of a visit to John Bull tyre making. There is an air of efficiency and meticulous control throughout every process that seems to pre-assure an A1 product.

All cycle-tyre making in Britain is designed to a high standard but it does strike one that at every stage of the job in hand at the Evington Valley Mills, the best ingredients are chosen, the controlled method of manufacture is continuously operating and the laboratory tests never fail to find fault, if fault there should be.

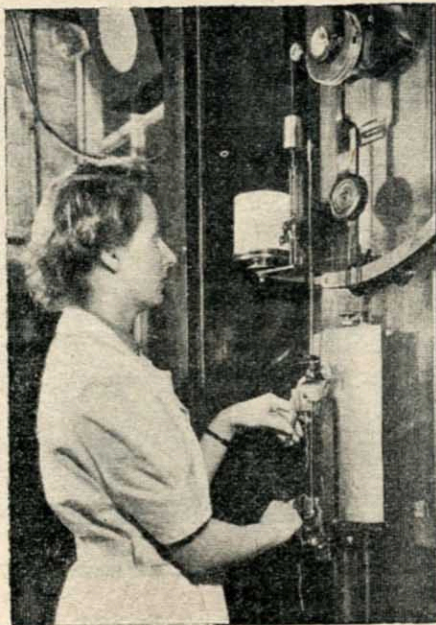
Rubber is a milky white fluid called latex which is tapped from a tree, the *Hevea Brasiliensis*. This latex is coagulated, that is curdled like milk; then the curds are rolled into sheets and dried off either fairly quickly by smoking or more slowly in the open air.

These sheets are the raw rubber of the industry.

The next process is to combine this raw rubber with various chemicals to impart to it the required properties. In a mixing machine the rubber is "chewed" with pre-determined quantities of the appropriate ingredients. One of the essential ingredients is sulphur, which causes the rubber to vulcanize at a later stage when heat is applied to the mixture. Vulcanizing not only toughens the compound but renders it elastic.

Put into the mixture also are accelerators (to speed up the vulcanizing process), stiffeners or softeners, according to the use to which the rubber is to be put, and also anti-oxidants to reduce the effect of air and sunlight, i.e., to stop the rubber from perishing. A reinforcer is carbon black which increases the tensile strength by several hundred per cent. Some rubbers have "fillers" added at this mixing stage. These are cheap chemicals such as china clay which increase the bulk and reduce cost. John Bull tread compounds are not cheapened by "fillers."

The tyre casing is made from a special cotton cord fabric which is weftless. The cords have to be of a high tensile strength and practically inextensible; that is incapable



(Above) Testing a strand of cotton cord used in making tyre fabric. It must have tensile strength but little stretch. (Below) Building a cycle tyre casing on a semi-automatic machine.



of being stretched. This fabric is treated with rubber so that each individual strand is enclosed in a sheath of rubber. This has the effect of reducing abrasion between threads in the casing, thus minimizing the possibility of fracture and increasing the life of the tyre base.

Tyre building is carried out on drums, some of which are semi-mechanically operated, the fabric being built into a flat casing enclosing two bead wires. The bead wires are, of course, specially made, accurate in circumference to within a few thousandths of an inch and absolutely inextensible.

This flat hoop of fabric wrapped diagonally across and round the bead wires has then laid centrally upon it the tread rubber—a flat strip of toughened compound calendered, that is pressed in a specially designed machine into a section with thickened centre (the "running" tread) and thin sides (side walls).

The hoop of fabric and rubber is then placed in the bottom half of a mould which is steam heated at a selected temperature. The mould is closed under hydraulic pressure and the tyre is left to "cook" for a pre-determined time. This time and temperature are very important as a slight "over cure" or "under cure" will result in a tyre which will give an inferior performance.

Both temperature and time are controlled electrically on every press, the control room being quite separate from the vulcanizing mill.

Here experts can watch every press on its own recording sheet and immediately investigate the operation of a press that is either running at the wrong temperature or is opened too soon or too late.

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