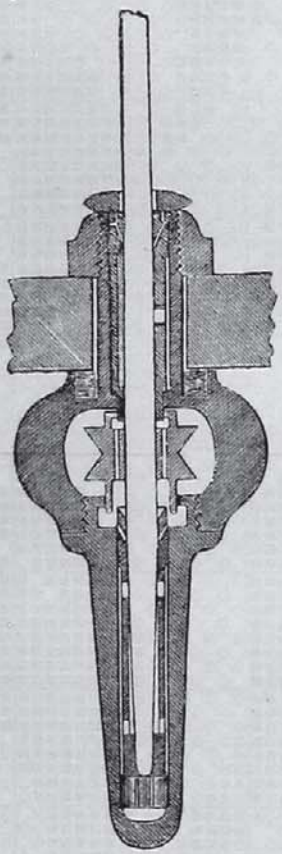
Machinery and Appliances.

AN IMPROVED SPINDLE.

In a recently patented spindle, illustration of which is presented herewith, the public, says our American contemporary, *The Textile Record*, have offered to them a simple, easily cared-for and durable device capable of the highest speed. It is one that will give the ordinary mill-help no trouble, and that will yield the greatest possible production and best quality of yarn from any given hank roving. Spindles embodying the principles of the patents are now in operation at a speed impossible of attainment under the old methods of construction. This speed is possible without any increase of wear, and at a positive saving of power.



The spindle is supported in a holder attached by a retaining nut to the bolster rail of the spinning frame. The whirl driving the spindle is below the bolster rail. The spindle has two bearings, one above and one below the driving whirl. The band driving the spindle has, therefore, the resistance equally divided between the upper and lower bearings. The holder is separable at the lower extremity of the yoke, and thus enables the spindle to be removed and replaced at pleasure, without disturbing the adjustment of the bolster bearing.

The spindle proper has an egg-shaped or parabolic foot which rests and revolves upon a flat, hardened disc. The foot is not confined, as in ordinary spindles, so that there can be no binding or friction by reason of want of allignment with the upper bearings. In the upper part of the yoke there is an annular chamber for holding oil. A wick feeds this oil by capillary attraction to the upper part of the bearing. The lower part of the support has ample space for a store of oil. Below the disc upon which the spindle revolves there is a chamber into which the sediment from the oil can collect, and from which it may be removed occasionally

Without going into a detailed description of the construction of this spindle support, it will doubtless be of interest to spindle users to know something of what is accomplished by this new candidate for public favour.

In the first place, a perfectly true-running high-speed spindle is secured, having two bearings, one above and one below the driving whirl. These bearings are easily removable, and, although very durable, can be replaced, when necessary, at a very trifling cost. A frame once fitted with these spindles would require almost no outlay for repairs. The means for lubrication are such that the spindle will not require oiling oftener than any of the so-called self-oiling spindles. The spindle will run absolutely true with any bobbin fit to be used on a spindle, and will preserve a perfectly upright position under the natural conditions of the varying load (that is, from empty to full bobbin). The simplicity of the device is its most favourable feature. It combines all of the advantages of the best and lightest running two-rail spindles, with all and more than can be claimed for the best of the modern single-rail spindles.

The spindle foot is at all times submerged in oil. The oil is so supplied to the bearings, that while they are at all times lubricated there can be no waste. No oil can be thrown upon the yarn. More of these spindles can be driven, per horse power, than of any other now before the public. The spindle under consideration is the joint invention of Mr. Stockton Bates, and will be known by his name.

[It would be more satisfactory if our American friends, when they come out with such a flourish of trumpets, would give us a little more specific information regarding speeds, production and such matters, instead of the vague general statements that are made to do duty for them.—Ed. *T.M.*]

Bleaching, Dyeing, Printing, etc.

HOSIERY YARN DYEING.

The desire to furnish goods whose colours are fast, knit goods especially, does not give much trouble to the manufacturer, but the dyer of the yarns for them encounters no small difficulties. These are not only caused by the demand that the colours shall be fast to washing, but particularly that they must not rub off upon paper, or muslin either. A knitting yarn supposed to be dyed in fast colours meets the requirements of consumers only in case it is fast to washing, but in particular they must not rub off. To attain this object we must at present content ourselves with combining the known methods of dyeing that yield colours absolutely fast to washing but which rub off, with those methods that give colours less fast to washing but which do not rub off. In producing fast colours upon cotton knitting yarns, by the processes described below, the two methods are united.

A blue fast to washing, but rubbing off, is vat blue. To the same class of colours belongs catechu brown, produced with prepared catechu boiled with bluestone, and developed with bichromate of potash. Not perfectly washing-fast, but not rubbing off, are the colours produced by the following dyestuffs:—Benzo-brown, benzo-azurine, benzo-black blue, violet black, and cotton brown, all of which are dyed upon a strongly alkaline bath with soap, and boiling for one hour.

VAT BLUE is combined with these dyestuffs by bottoming upon the vat to half the depth of the required shade, washing well after developing and dyeing upon an alkaline bath with benzo-azurine or naptho-cyamine for light colours, with benzo black-blue for darker, and with violet black for deep shades; finally washing well and soaping upon a fresh bath. A very dark, nearly black, vat blue is, before entering the vat, feebly bottomed with cachou de Laval, or with catechu (developed with potassium chromate), washed, blued upon the vat, and finished as stated. A navy blue and vat blue, dyed in this manner is very soft and glossy, and does not rub off with gentle rubbing. It stands washing very well, if not handled too severely, and if correctly treated in the finishing dye-bath, it can be washed, together with white bleached yarns, without giving them a colouring.

BROWN is dyed by bottoming with catechu and potassium bichromate to about half the required shade; washing well and dyeing with an alkaline bath with benzobrown or cotton brown for light shades; and with a mixture of benzobrown and benzoblack, blue, or violet black for medium and dark shades; finally washing and soaping in a fresh bath. A brown thus dyed is not only very handsome and soft, but perfectly fast.

For the production of fast Bordeaux and garnets the well-known fast to washing, but not to light, garnet obtained from primuline may be used, by development and by topping it with benzopurpurine or brilliant Congo, and shading it with benzoblack, blue, or violet black. The Bordeaux thus dyed are fast for washing and rubbing, but not to light, which defect may be overlooked considering the use to which the article is put. To obtain dark garnets, which are to be less bright but more fast to light, a bottom is dyed with cachou de Laval, or with catechu and bichromate of potash, well washed and dyed in an alkaline bath with benzopurpurine or brilliant Congo, and shaded with benzoblack, blue, or violet black. These most fashionable colours vary only in shade, and any shade is easy to produce to sample by applying the above methods. Many dyers are of opinion that the same effect can be obtained by the substantive dyestuffs alone; it must not be overlooked, however, that though buyers may be satisfied at first sight by the colours not rubbing off, complaints are pretty sure to be made afterwards of the small degree of fastness to washing if these colours are used alone. The colours produced after the method recommended by the writer are not the best, but they are faster and more adapted to hosiery dyeing than all other dyes, such as plain vat blue, alizarine, Bordeaux, and brown by catechu alone, all of which smut on rubbing. The only correct way would be if possible to produce blues, browns, and garnets upon the fibre by a chemical process similar to the aniline black.—E. LINDENGER, *Oest. Woll. Lin. Ind.*

AZO DERIVATIVES OF BETA-NAPHTHOHYDROQUINONE.

The orthodioxy derivatives of aromatic hydrocarbons cannot, as a rule, be made into azo compounds. This has been attempted many times by chemists, because, judging by analogy, these dioxy compounds will yield faster colouring matters than the simple hydrocarbons themselves, but the fact that they do not form azo compounds by the ordinary processes has hitherto prevented their use. Dr. Otto N. Witt has, however, found that alpha-beta ortho-dioxynaphthalene can however be made to yield azo derivatives; this body is better known as beta-naphthohydroquinone. When cold aqueous solutions of this body are made to react with diazo compounds, such as diazo-benzene chloride, colouring matters are produced which possess one very important property, namely, that of combining with aluminium, iron, and chromium oxides to form insoluble lakes. These new colouring matters can, therefore, be dyed on mordanted fibres like alizarine and logwood; and thus dyed they give shades of colour said to be very fast.

By using diazo-benzene chloride to combine with the dioxynaphthalene an orange powder is obtained which can be introduced into commerce in the form of a paste, and which can be used for dyeing and printing cotton; with alumina mordants a bluish pink is obtained; with iron mordants a grey violet, while chrome mordants give purple tints.

By using diazo-benzene sulphonic acid to react with the beta-napthohydroquinone, a colouring matter is obtained which is soluble in water, and can be used for dyeing silk and wool, on which it produces red or purplish tints, according as alumina or chrome has been used to mordant the fibres with. Other colouring matters can be produced by similar means, all of which