Hydro-extraction has been a problem to all mankind ever since one man invented a custom for them to wear clothing, as none of the materials that have yet been employed for that purpose have had the quality of maintaining themselves in a condition of perfect cleanliness, or of automatically cleaning themselves. Hence the necessity of washing and afterwards drying them. No doubt, the sun's rays, and the atmosphere either still or in motion, were the first hydro-extractors, and very good ones too when time could be given for the exercise of their influence. This, however, would not always occur, and various methods would be sought to hasten the attainment of the desired state. Wringing and squeezing were no doubt early practiced to, and the drying finished by exposure to the warmth of the sun. All this, however, is less desirable in a few words, implies, no doubt, a considerable lapse of time before the various methods were discovered. They each, however, mark progress, and in various ways have been used from time immemorial for this purpose. Possibly it would be much later before the best of all the methods was invented. This was the discovery of the power of centrifugal force to throw off water from any article containing it when not specially impeded. The principle has been known for ages, and doubtless was playfully applied thousands of times by ancient washers when it was a common practice to resort to the brook-side for the purpose of washing clothing, during which they would "whit" or throw a wet skin or cloth horizontally over their head or violently in front making the water fly in spray from it upon their companions. Here unquestionably was the principle of the modern hydro-extractor unconsciously evolved and repeated many a time before its value was recognized and applied as we know it today. The mechanical embodiment and economical application of the principle as we know and use it now is of recent date, but to trace the history of its development would take more time than space that are at our command at the present moment. It will be sufficient to observe that the machine now known as the hydro-extractor, like every other machine, has attained its present degree of perfection by slow steps upward.

A few words of description may be necessary to enable our readers, who are not technically acquainted with the branch of business in which the hydro-extractor is used, to comprehend it. Generally speaking the hydro-extractor consists of a strong outer casing containing a basket or cage for the reception of the material to be operated upon. These cages are composed of copper or galvanized steel perforated or wired as may best suit the requirements of the case. The cages are usually mounted upon vertical shafts and driven either by strap or gearing. When this is the case, however, difficulty and trouble is often experienced, especially with straps which get damped and slack, and soon render it almost impossible to run the machine at a uniform or satisfactory speed. In the ordinary machine and with the ordinary form of driving a strong foundation is required, as the speed at which the machine are run causes great vibration. The uselessness of the machine, too, is materially reduced when the engine is driving upon the main engine of the establishment, as, if wanted to be worked when the other portion is stopped, the engine must run at comparatively great expense to drive it. Experience of these disadvantages led to the invention of the machine we are now about to describe.

The patent suspended steam-driven hydro-extractor, as made by Messees Thomas Broadfoot and Son, Central Iron Works, Huddersfield, is remarkable in a high degree for its simplicity, perfection and durability, and above all for the ingenious manner in which the obvious disadvantages of the older type of the hydro-extractor are eliminated. All the difficulties of driving arising from belts or gearing are done away with by substituting a small steam engine and thus driving directly. This engine is attached to the machine; it is very simple, though of peculiar construction, having been specially designed for its purpose. It is absolutely balanced and well finished, rendering it possible to work at a very high speed with a minimum of liability to get out of order. The reciprocating parts are made of the most carefully selected material; and constructed as lightly as possible consistent with safety and durability; and, in order to be placed on any ordinary floor strong enough to bear its weight without fear of damage from vibration. The engine is supplied with a steam service pipe of about one inch diameter, which enables the machine to run independently of the main engine at any time, which is an especial advantage when there is a press of work. This type of machine occupies less space than machines driven in the ordinary way, and is much less dangerous, owing to the absence of the usual accessory that are liable to entangle the clothing of attendants. It is quite noiseless, and requires no skilled labour for its superintendence. The method of direct steam driving is the only one by which the slippage of belts and wasteful friction can be avoided in starting and stopping, and which have in the older form been a large item, as may be inferred when it is stated that the weight of a loaded basket is nearly half a ton, which must be quickly raised from a state of rest to make about 1,000 revolutions per minute. From the fewness, simplicity, and excellent construction and finish of the working parts, and the provision of means by which all wear can be taken up, the cost in repairs is reduced to the narrowest, much less in fact that of maintaining belts alone in the older system of driving. In proof
of this, it need only be stated that machines constructed by Messrs. Broadbent's on this principle, with only ordinary attention, have cost nothing in repairs during a service of from six to eight years.

The firm will make them in all sizes from $50 to 60 inches diameter of basket and for all branches of manufacture in which they are a requirement; and also for laundries. Messrs. Broadbent and Sons will be pleased to give any information that users and intending purchasers may desire, and applications to them at the above address will receive prompt attention.

THE RICHMOND PATENT DOUBLE MOTION CARD GRINDER.

The Richmond patent double-motion for card grinders, shown in the accompanying illustration, is a radical departure from all existing machines. It can be applied to any card-grinder, and the builder claims that it will do as much work in three hours as can be done in ten with other grinders.

The two conical grinders revolve in opposite directions, having also the regular traversing motion; in this way, the grinding surface comes in contact with all sides of the teeth equally and produces a round point instead of the ordinary chisel point. It also does away with all possibility of broken teeth from over-grinding, and of the necessity for stopping or

spinning in a few minutes. The grinders, which are now being manufactured at Richmond, are sold from $100 to $500, according to size. The manufacturer will be pleased to give any information that users and intending purchasers may desire, and applications to him at the above address will receive prompt attention.

News in Brief.

ENGLAND.

Ashton.

The three mills, together with the warehouse belonging thereto, in the hands of Mr. Joel Heathcote, and owned by the Eastern Mills, are to be purchased by the Orrell Sprinkler. The work is being carried out by Messrs. Dawson, Taylor and Co., of Salford.

Bolton.

Mr. Althorp has severed his connection with the firm of Messrs. Johnson, Johnson, and Co., and Moir Mill. The business will probably be continued by Mr. Johnson's younger son, under the name of Johnson and Son.

Bury.

Most of the mills in Bury at present work on Thursday evening, and resume on Thursday morning, which is the usual length of half-time holidays.

Although the weavers' officials say that the strike still exists at Mount Pleasant Mill, Mesnes, and certain mills in the town, it is believed, all the looms are running.

Matters are said to be, unfortunately, not very prosperous at another half-time in the town—The Oak Mount. In the present state of trade there is only a dull outdoor look, and the silent looms, week by week, on the understanding that the makers will not return to work, and the men are now on strike against alleged bad work (and consequently low wages) and hours.

Church.

The Globus Manufacturing Co. have "woven up" and closed their shop of 750 looms owing to bad trade.

We understand that Mr. John Haswell is working the material out of his mill, and that there is little prospect of closing for a time owing to the unsatisfactory state of trade. The mill contains about 600 looms.

Farnworth.

Mr. John Hindley's Egerton-street mill still remains closed.

In consequence of slackness of trade, a number of the coloured mills here have commenced to run four days a week.

Since taking over Haspa Mills, Swinton, Mr. Thos. Boulton has found it necessary to stop a portion of the machinery at his Farnworth mill.

The spinning and weaving mills in Worsley-cum, belonging to Messrs. S. Horst and Co., Limited, and which have been standing for about two years, are now being painted, in view of putting them up for sale.

Hastings.

Several of the large weaving concerns in the Hastings district are running short of work.

Heywood.

A meeting was held on Monday night, at the Free Masons' Arms Hotel, Heywood, to take into consideration the advisability of forming a company to erect a mill of a capacity of about 100,000 spindles, on the site of the ill-fated Mills Heywood, under the name of Heywood and Company, who presided, advised the townspeople to adopt the policy of "self-help." If they had done that ten or twelve years ago, Heywood would have been more prosperous than it was at present. Abundance of money was going out of the town by investment in Oldham and other towns, and he asked them to form their own companies, that a little more than they had done. The site, in his opinion, was a very good one. His advice was that they should get as many as possible of the share taken up before they embarked in the enterprise.

Miss M. W. Heywood stated that a mill over 60,000 shares were already promised to be taken up, and gentlemen in the town had expressed their willingness to help the project. A number of shares taken up before they embarked in the enterprise. Miss M. W. Heywood stated that a mill over 60,000 shares were already promised to be taken up, and gentlemen in the town had expressed their willingness to help the project. A number of shares were already taking up before they embarked in the enterprise.

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