

CLASS I., Sub-Class C.—JOHN COX, of Auckland.—(Dated 22nd February, 1867.)

A Machine embracing certain improvements for Hackling and Preparing Flax and other Fibrous Substances.

THE said machine consists of a novel mode of hackling or combing flax, or other fibrous substances, in such a manner as to free the fibre more or less from all vegetable substance, impurities, noxious and other matters pertaining thereto.

The hackles or combs are to be made of steel or other suitable material, sharpened at the point and rounded at the edge, and be of sufficient width to allow of a hole being punched or drilled for an iron to pass through for the purpose of keeping them in exact position.

CLASS I., Sub-Class C.—E. W. TRENT, of Christchurch.—(Dated 17th June, 1869.)

Principle of the Machine.

THIS machine is constructed on the principle of a rotary comb or card; the teeth are made of steel or tempered iron, about one-eighth of an inch in thickness, projecting from the wood, lagging any distance that may be thought desirable; the points are short and sharp. The points enter the leaves and divide the fibres; after which the rapid succession of the bodies of the teeth passing through the flax leaves, impart a continual chafing or rubbing of the fibres, which thoroughly separates the vegetable gum from them. The efficiency of the machine depends upon the high rate of speed at which the drum is run, and the proper speeding of the feed rollers. The principle may be said to consist of combing combined with friction.

In the construction of this machine there is no necessity for any of the working parts to be confined to any particular dimensions.

Description of the Feeding Table.

The feeding table consists of two sides of timber, in which revolve two small wooden rollers; round these rollers is stretched an endless band of cloth which is kept constantly travelling towards the feed-roller, being driven by a pulley which is driven by a belt and pulley from the drum spindle, the flax leaves are fitted in the holder and screwed up tight. They are then laid on the endless band of cloth, which draws the points of the leaves towards the feed-rollers, the holders sliding over the cloth in a groove on each side the feed-table.

Observations.

The flax may be prepared by this machine either from the green leaf, or after having been submitted to the action of steam or water. The teeth may be made either round, square, triangular, octagonal, or in any other form rod steel is manufactured.

The machine is capable of being used either with or without the feeding table.

CLASS II., Sub-Class A.—JOHN JOURNEAUX, of Melbourne, Victoria, now of Wellington, New Zealand.—(Dated 23rd February, 1870.)

1. STEAM pipes are connected to a steam boiler; these pipes are connected to branch pipes, which are introduced into a series of double-bottomed vats. The object of the double bottom is that the steam may be introduced by this means and the mass heated as required without the steam coming in direct contact with the fibre.

That part of the branch pipes which is within the double bottom of each of the vats is perforated with small holes. The steam from the boiler is by this means ejected from the pipes into the space between the double bottom, so as to cause the water in the vats to become heated to a certain degree hereinafter described. The branch pipes are also provided with brass cocks, so as to regulate the amount of steam. The raw leaves of the *Phormium tenax* are first passed through a pair of ordinary grooved rollers. The leaves having been thus bruised are placed longitudinally in one or more of the vats referred to. The vat being half-filled with these bruised leaves, water is admitted in sufficient quantity to cover them.

One of the cocks is then opened and steam admitted by means of the branch pipes until the heat of the mass has risen to 190° Fahrenheit. The whole is allowed to remain in that degree of heat for three hours. The liquor is then drained off into a cistern. Fresh water is then admitted into the vat, and heated by the same agency to 90° Fahrenheit. A leaven composed of materials hereinafter described is then mixed with the contents of the vat, and vinous fermentation is allowed to take place. A uniform degree of heat is kept up during 60 or 70 hours. When the fermentation has attained a slight degree of acid, the whole bulk of the fibre is removed and pressed out. It is then placed in an adjoining vat containing water already heated to boiling point which carries away all vegetable matter still adhering to the fibre. It is then taken out and passed through the squeezers which partly dry it. The fibre of the *Phormium tenax* is then by the above process of fermentation found to be entirely deprived of that gum which it naturally produced, and which has become neutralized. It is finally submitted to a drying process and is prepared for the market. The leaven before mentioned consists of—

30 lbs. potatoes,	} to three hundredweight of flax.
2 lbs. sugar, and	
$\frac{1}{2}$ gallon of yeast	

2. The extraneous matter beaten from the leaf as it passes through the rollers contains a large quantity of gum, and is allowed to fall into a bin placed under said rollers, and conveyed through a shoot into the cistern, which contains the liquor drawn from every first soaking of the fibre. These contents are boiled in the said cistern by means of steam injected within the double bottom for two hours. The gum then separates from the vegetable matter and settles to the bottom, and all foreign matter floats on the top and is skimmed off. The gummy substance is then allowed to cool, and proof alcohol is applied in the proportion of one to thirty gallons. The whole is then well stirred and allowed to settle.