

rollers, the journals of which are supported by elastic bearings. Price's machine is a type of this class.

2. Metallic beaters are fixed to the face of a drum and form right and left angles to the axis of rotation; the drum revolves at a high speed, and the beaters operate on one side of the leaf on a metallic plate supported by elastic bearings. Messrs. Fraser and Tinne's machine is a type of this class.

3. Metallic beaters are fixed to the face of a drum parallel to each other and at an angle to the axis of rotation; the drum revolves at a high speed and operates on one side of the leaf, on a metallic bar supported by elastic bearings. Mr. Gibbons' machine is a type of this class.

4. Metallic beaters parallel to each other are fixed to pairs of arms radiating from a shaft which revolves at a high speed, and by means of two such sets of revolving beaters both sides of the leaf are operated on, on a series of narrow metallic bars supported by elastic bearings. Mr. Booth's improved machine is a type of this class.

5. Metallic beaters parallel to each other are hung loosely between the outer edges of discs fixed on a shaft which revolves at a high speed, the loose beaters operate on one side of the leaf on metallic rollers, the journals of which are supported on elastic bearings. J. H. Noding's machine is a type of this class.

6. Metallic beaters are fixed parallel to each other and to the axis of rotation on the face of two drums revolving together at a high speed and operating on both sides of the leaf; the beaters of one drum striking on the space between the beaters of the other alternately. Pownall's machine is a type of this class.

*Sub-Class B.—By Percussion on Non-elastic Metallic or other Surfaces.*

1. Metallic or wooden stampers, with or without springs, are caused to fall on the leaf, on a bed of wood or metal, fixed or moveable, with or without water.

Messrs. Purchas and Ninnis', Mr. Franz Scherff's, and Howland's machines are types of this class.

*Sub-Class C.—By Combing on Elastic Metallic Surfaces.*

1. Metallic spikes, radiating from the face of a drum, which revolves at a high speed, operates on one side of the leaf on metallic rollers, the journals of which are supported by metallic bearings.

E. W. Trent's and John Cox's machines are types of this class.

CLASS II.—WHEN THE LEAF IS BOILED OR STEAMED.

*Sub-Class A.—By Vinous Fermentation.*

1. The crushed leaves are softened by a water-bath heated to 190°; then passed between pressure rollers to remove refuse matter; then subjected to vinous fermentations in a water-bath heated to 90°; finally, squeezed, washed, and dried.

John Journeaux's is a type of this process.

*Sub-Class B.—By Grooved Pressure Rollers.*

1. Metallic rollers, grooved at right angles to the axis, and fixed in rolling contact; squeeze out the refuse matter and divide the fibre.

Mr. Pownall's machine is a type of this class.

*Sub-Class C.—By Combing on Elastic Metallic Surfaces.*

Similar to Sub-Class C., Class I.

Michael Murray's machine is a type of this class.

*Sub-Class D.—By employing Substances which exercise a Chemical Action combined with Mechanical Appliances.*

1. Prussiate of potash is the chemical agent used. The machine has metallic beaters parallel to each other and to the axis of rotation fixed on a wood roller or drum, the axis of which is fixed on elastic bearings; the drum revolves in water and operates on the leaf, which is fed in sideways on fixed metallic bars parallel to each other, but at an angle to the axis of the drum.

Mr. L. Natrass's machine is a type of this class.

2. The leaves are first crushed by means of pressure rollers, and are then subjected to a cold water bath to remove impurities; then to a hot water bath raised to 212°, in which fish or other animal substances have been digested.

Cornelius Thorne's is a type of this process.

*Sub-Class E.—By Percussion on Elastic Non-metallic Surfaces.*

1. Metallic beaters parallel to each other are fixed to pairs of arms radiating from a shaft which revolves at a high speed; and by means of two sets of such revolving beaters, both sides of the leaf are operated on on india-rubber rollers. Booth's patent is a type of this class.

CLASS III.—WHEN THE FLAX HAS BEEN OPERATED ON BY ANY OF THE PREVIOUS PROCESSES TO SOFTEN AND SEPARATE THE DRIED FIBRE.

*Sub-Class A.—Friction and Pressure between Metallic Rollers.*

1. To a metallic roller, grooved on its face, parallel to its axis, is imparted, by suitable machinery, a reciprocal rotary motion greater in one direction than the other; grooved rollers of smaller diameter, the journals of which work in elastic bearings, are fixed in rolling contact with the large roller, the fibre being operated on between the surfaces of the small and large rollers.

G. A. C. Bremme's and J. E. Hodgkin's machines are types of this class.