

**SPINNING WOOLLEN AND  
WORSTED: BEING A PRACTICAL  
TREATISE FOR THE USE OF ALL  
PERSONS ENGAGED IN THESE  
TRADES**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649270637

Spinning woollen and worsted: being a practical treatise for the use of all persons engaged in these trades by Walter S. Bright McLaren

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.  
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

[www.triestepublishing.com](http://www.triestepublishing.com)

**WALTER S. BRIGHT MCLAREN**

**SPINNING WOOLLEN AND  
WORSTED: BEING A PRACTICAL  
TREATISE FOR THE USE OF ALL  
PERSONS ENGAGED  
IN THESE TRADES**



## P R E F A C E.

---

THE design of this Manual is to describe in a concise form the principles of worsted and woollen spinning, as exemplified in the machinery employed in the various processes of those trades. There are many spinners, both masters and workmen, who know their business without having paid much attention to the reasons why the different processes are employed to produce required results ; and there are probably still more who do their work by rule of thumb, and never take the trouble to make the exact calculations which are really required. No better example of this can be found than the way in which wool is generally washed, without any regard to what is best for it, but merely with a view to cheapness and obtaining a good colour. That this arises from ignorance of the structure and nature of wool is most probable, and therefore a considerable amount of space has been devoted to this branch of the subject. To those who desire to know the reasons for what they are doing, and to have in a convenient form the rules for all the calculations they require, it is hoped this book may be useful ; while to those who are not actually spinners, but who desire to have an insight into the trade, it may prove clear and instructive. 47018

It has been too much the custom to consider weaving as the one important part of the textile industries; and in all discussions on technical education, spinning and its preparatory processes have been almost if not entirely ignored. It may be doubtful whether a spinning school would be of much use compared to its cost; but the technology of the trade is amply sufficient to require such a work as the one now presented, while weaving may well be left for separate treatment. The present work treats of both worsted and woollen spinning. So far as I am aware, no book has ever been written on the former, and yet its processes are much more numerous and more delicate than those of the latter, and much greater exactitude is required and can be obtained in them. Regarding the woollen trade, and especially carding, much has been written, and, therefore, little that is new can be said; but it is hoped that the method here followed may be of more practical use to the carder than has been the case with other books. The aim has been in every chapter to make the Manual such that the overlooker in every room in every mill will find it a guide in his work.

Although the worsted and woollen trades are quite separate, they have the same raw material, and the initial processes of sorting and washing are common to both. It would be better for each trade if it knew more of the other, and could take hints from it. One of the weak points in the workmen of the present day is that they only know their own branch of their own trade, and

have no opportunity of obtaining that general knowledge which increases their power of usefulness. This work may in a small degree tend to remove that defect, and will show how much there is in common between the two trades.

It has been necessary to explain the workings and construction of certain machines at some length, rather than to confine the Manual to general principles. But in any manufacturing trade, the principles can only be seen clearly when carried out in practice by the machinery, and therefore without the descriptions they would only be understood by those actually engaged in giving effect to them in daily work.

I gladly take this opportunity of thanking those friends, among whom I will only mention the Manager and overlookers of my own mill, who have kindly given me much help in preparing this Manual.

WALTER S. B. McLAREN.

*Springfield Mill, Keighley.*

# CONTENTS.

## CHAPTER I.

### THE NATURE OF WOOL.

PAGE

1. Wool and Hair—2. Growth of Wool—3. Formation of the Fibre—4. Wool, Fibrous and Porous—5. Serratures of Wool—6. Serratures in Various Wools—7. Causes Affecting Length and Quality—8. Trucness of Breeding—9. Soundness of Fibre—10. Softness, Fineness, and Length—11. Colour—12. Felting—13. Alpaca and Mohair . . . . . 1

## CHAPTER II.

### WOOL-SORTING.

14. Hogs and Wethers—15. Different Qualities of Wool—16. Range of Qualities—17. Names of Qualities—18. Form of the Fleeces—19. Skin Wool—20. Wool-Sorters' Disease—21. Theory of the Disease—22. Nature of the Disease—23. Best Preventive—24. Method usually Employed . . . . . 14

## CHAPTER III.

### WOOL-WASHING AND OILING.

25. Yolk on Wool—26. Sheep Washing—27. Advantages and Disadvantages of Washing Sheep—28. Adulterated Soap—29. Effect of Hard Water—30. Means for Softening Water—31. Receipts for Soap—32. Danger of Strong Soap and Hot Water—33. Petrie's Washing Bowl—34. McNaught's and Jefferson's Bowls—35. Dr. Braun's Machine—36. Verviers Wool-washing—37. Ordinary Hot Blast Drying Machine—38. Petrie's Dryer—39. Moore's Dryer—40. Hydro-Extractor—41. Oiling Wool—42. Best Oil to be Used—43. Oleine Oil for Woollens—44. Test for Oil—45. Quantity to be Used—46. Carbonisation—47. Methods Employed—48. Wool not Injured if Care be Taken—49. Wiesner's Experiments—50. Extraction of Oil from Soap Suds . . . . . 24



## CHAPTER IV.

## THE DIFFERENCE BETWEEN WORSTED AND WOOLLEN.

PAGE

51. Worsted and Woollen—52. Former Distinction Untenable—53. Difference not in Length, nor in Combing and Carding—54. Nor in Mule and Throstle—55. Nor in Milling—56. Difference lies in Arrangement of Fibres—57. In Worsted, Fibres lie Smooth and Parallel—58. In Woollen, Fibres lie Roughly and Crossed—59. Appearance of the Two Yarns—60. Processes Designed to Assist these Characteristics—Worsted—61. Process for Woollen—62. Definitions of Worsted and Woollen Threads . . . . . 52

## CHAPTER V.

## PREPARING AND CARDBING FOR COMBING.

63. Different Treatment for Different Yarns—64. Subdivision of Processes for Worsted—65. Preparing by Gill Boxes—66. Principle of First Gill Box—67. Clough's Gill Box—68. Diagram of Clough's Gill Box—69. Set of Gill Boxes—70. Levelling the Slivers—71. Method of Oiling—72. Special Points needing Care—73. Fallers—74. Draft of Gill Boxes—75. Draft between Front Rollers and Fallers—76. Suitable Drafts for Set of Boxes—77. Preparing for Mohair and Alpaca—78. Carding before Combing—79. The Tenter Hook Willey—80. Lickers-in or Opening Rollers—81. Arrangement of a Card—82. Barring Rollers—83. Carding without Combing—84. Difference between Preparing and Carding—85. Capability for Milling not affected by Gilling—86. Back-washing—87. Card Clothing—88. Speeds of Cards—89. Modern Improvements . . . . . 61

## CHAPTER VI.

## WOOL-COMBING.

90. Hand Combing—91. The Nip Comb—92. Action of the Nip Comb—93. Chief Point of the Nip Comb—94. Setting of Nip Comb—95. Noble's Comb—96. Ground Plan of Noble's Comb—97. Feeding the Noble Comb—98. Dubbing Brushes—99. Double Drawing-off Rollers—100. Defects of Noble's Combs—101. Holden's or Square-motion Comb—102. Bailey's Nail-motion—103. Advantages of Holden's Comb—104. Other Combs—105. Hailing or Top-making . . . . . 90

## CHAPTER VII.

## DRAWING.

106. Principle of Drawing—107. Drafting Twice the same Way—108. Open Drawing—109. Two-Spindle Gill Box—110. Varying Speed and Drag of Bobbin—111. Open Drawing Boxes—112. Knock-off Motion—113. Roving and Size of Bobbins—114. Botany Open Drawing—115. Drawing without Gills—116. The Rutch—117. Amount of

## CONTENTS.

xi

PAGE

|  |     |
|--|-----|
| Draft—118. Calculations for Draft—119. Test of Calculations—120. |     |
| Gauge Points—121. Corresponding Speeds of Boxes—122. Advantage   |     |
| of Cone Drawing—123. Principle of Cone Drawing—124. Effect of    |     |
| Cone Drawing—125. Variation in Speed of Bobbins—126. The Bob-    |     |
| bin can Lead the Flyer—127. Speeds with Flyer leading Bobbin—    |     |
| 128. Speeds with Bobbin leading Flyer—129. French Drawing—130.   |     |
| Effect of French Drawing . . . . .                               | 118 |

### CHAPTER VIII.

#### WORSTED SPINNING.

|  |     |
|--|-----|
| 131. Principle of Spinning—132. Flyer Spinning Frame—133. Flyer  |     |
| Spinning—Twisting and Winding the Yarn—134. Calculations for     |     |
| Twist and Speed—135. Calculations for Draft—136. General For-    |     |
| mulae for Spinning—137. Cap Frame—138. Drawhaeks and             |     |
| Advantages of Caps—139. Movable Cylinders for Cap Frames—        |     |
| 140. Ring Spinning—141. Improved Lifter Motion—142. Important    |     |
| Points in Ring Spinning—143. Fox's Ring and Cap Frame—144.       |     |
| Mitchell's Caps for Spinning-Bobbins—145. Stop-motions for Spin- |     |
| ning Frames—146. Worsted Mule Spinning—147. Calculations for     |     |
| Yarn . . . . .   | 150 |

### CHAPTER IX.

#### WOOLLEN CARDING.

|   |     |
|---|-----|
| 148. The Woollen Trade—149. Shake Willey—150. Blending and Oil- |     |
| ing—151. Mixing Wool and Cotton—152. Care needed in Blending    |     |
| —153. Mixing Willey—154. Shoddy, Mungro, and Flocks—155.        |     |
| Burring Machine—156. Card-feeding Machines—Evan and King's—     |     |
| 157. Bramwell's Weighing and Feeding Machine—158. The Scribbler |     |
| —159. Functions of the Various Rollers—160. Relative Action of  |     |
| the Card Wires—161. Setting the Rollers—162. Lickers-in and     |     |
| Breast—163. The Swift—164. The Fancy—165. The Doffer—166.       |     |
| The Workers and Strippers—167. Grinding—168. Turning and        |     |
| Covering Rollers—169. Card Clothing—170. To find the Amount of  |     |
| Clothing Required . . . . .                                     | 154 |

### CHAPTER X.

#### FEEDING, CONDENSING, AND SPINNING.

|   |     |
|---|-----|
| 171. Intermediate Feeding Machines—172. Blamire's Feed—173. Balling |     |
| Head and Creel Feed—174. The Scotch Feed—175. The Apperley          |     |
| Feed—176. Last Swift to be Covered with Filletting—177. Ring        |     |
| Doffers—178. Double Rubber Condenser—179. Single Rubber             |     |
| Condenser—180. Double Doffer—181. Belgian Condenser—182. Belgian    |     |
| Carding—183. Mule Spinning—184. Difference between Worsted and      |     |
| Woollen . . . . .   | 213 |

## CHAPTER XI.

## TWISTING, REELING, AND SCOURING.

|  | PAGE |
|--|------|
| 185. Winding—186. Roller and Trap Twisters—187. Stop-Motion Twisters<br>—188. Effect of Twisting—189. Reeling—190. Gassing and Scouring<br>—191. Shrinking—192. Conclusion . . . . . | 235  |
| GLOSSARY . . . . .   | 246  |
| INDEX . . . . .  | 253  |