Sept. 8, 1959 H. P. TWITCHELL 2,902,724

CARDING ENGINES FOR WOOL

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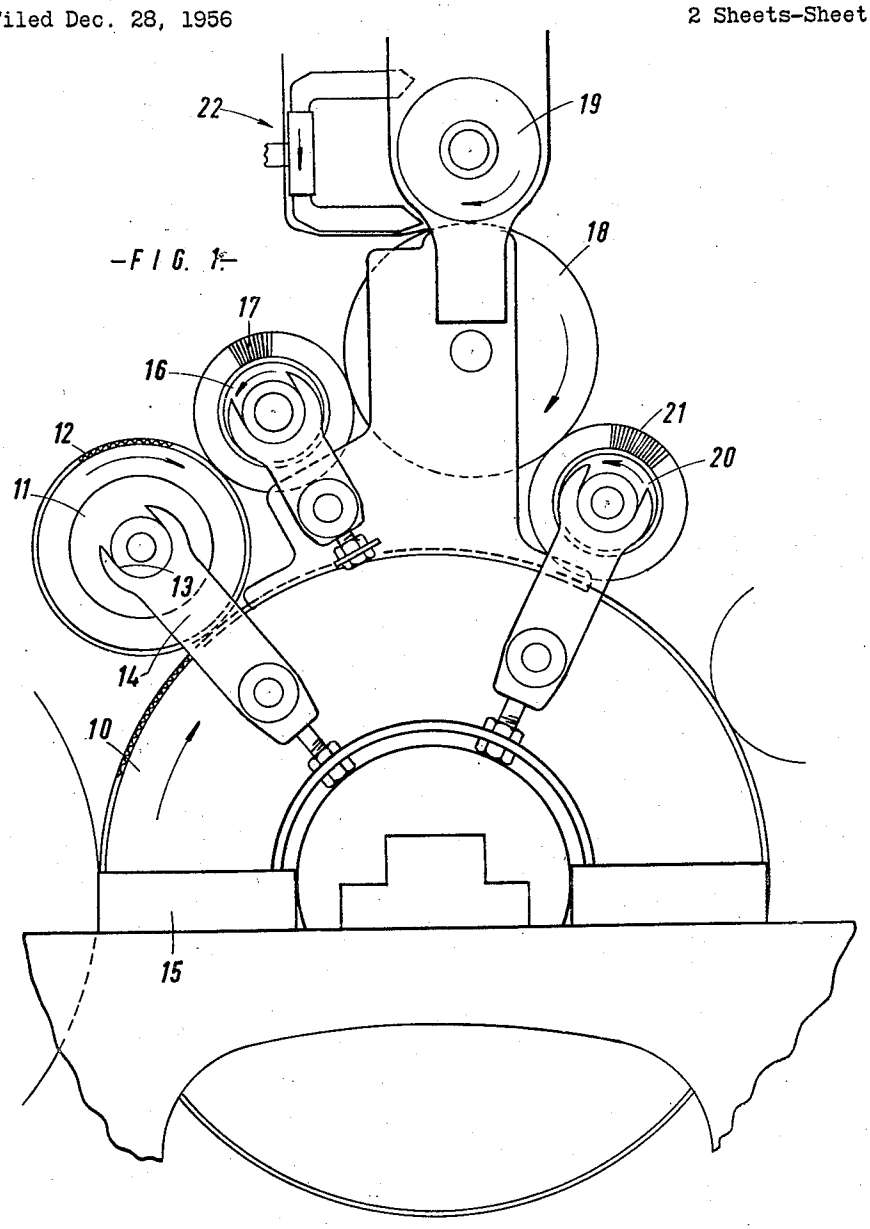


FIG. 1

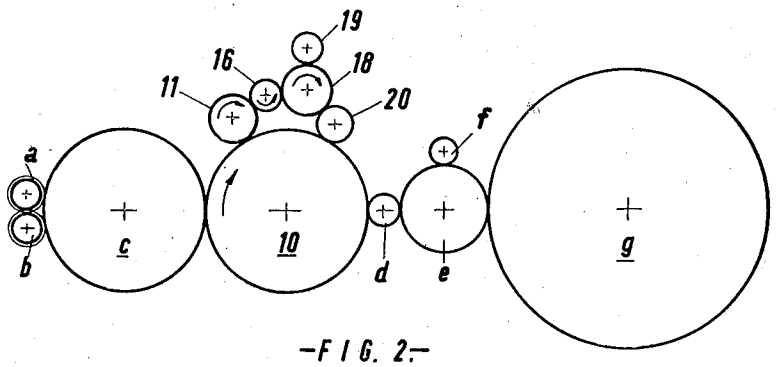
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-FIG. 2-

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CARDING ENGINES FOR WOOL

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7 Claims. (Cl. 19—99)

This invention concerns carding engines for wool, especially worsted.

Known types of carding engines for wool are divided into two main types. In that type of carding engine known as the French card, there is a lickerin, over which a web of fool fibres passes, a breast roller to receive the fibers and a pair of burr beaters, one located to operate in conjunction with the lickerin and one located to operate with a Morel roller which is located adjacent the breast roller on the side remote from the lickerin. In the Yorkshire card the arrangement is somewhat different in that there are four lickerin rollers, the last one being a Morel roller, and working in conjunction with these lickerin rollers are three dividers which serve to transfer the web from one lickerin to the next. In this arrangement there are seven burr beaters, there being one associated with each lickerin and one with each divider.

The main disadvantage of such arrangements is that a lickerin normally takes up a woolen web which consists of a lower part, being the looser woolen fibres picked up by the teeth of the lickerin, and an upper part, being the more closely matted fibres picked up by the points of the lickerin teeth. In a web of normal thickness where such conditions obtain, burr-beaters, operating subsequently on the web, cannot act efficiently on the unopened upper web surface. By reducing the thickness of the web in an attempt to overcome this difficulty production is correspondingly cut down.

It is the principal object of the present invention to provide a method and means whereby a web of woolen fibres on a pre-opening roller (i.e. a lickerin, breast roll or the like) may be more efficiently treated. More particularly it is an object of the invention to provide a method and means for more efficiently removing burrs from such a web. Another important object of the invention is to provide such means which are in the form of an attachment for standard apparatus which can quickly be moved out of and into operative position.

According to the present invention a method of preparing wool (especially worsted) fibres for carding includes the step of separating the outer part only of a web of fibres from the rest of the web as the web is being progressed by a pre-opening roller (i.e. a lickerin, breast or like roller), subjecting said outer part to a burr-removing process, and finally re-uniting said outer part of the web to the remainder of the web at a subsequent point on the roller.

Normally the re-united web will then be passed from the roller to a further burr-removing process.

According to the present invention a machine for the treatment of wool fibres before carding includes, in association with a preopening roller (i.e. a lickerin, breast or the like roller), an assembly consisting of a divider, a brush, a Morel roller, and an angle stripper in succession, and an burr-beater associated with the Morel roller, the arrangement and disposition thereof being such that the outer part only of a web of wool fibres

fed to the roll is continuously separated by the divider from the rest of the web, said outer part being passed by the brush to the Morel roller where the burr-beater is operable to remove burrs and the like, and finally conveyed by the angle stripper to be re-united at a subsequent point on the pre-opening roller with the remainder of the web.

Preferably the assembly will be so mounted and arranged that the divider may be adjusted away from the pre-opening roller to render the assembly inoperative.

The invention will now be described further, by way of example, with reference to one practical form thereof as shown in the accompanying drawings in which Fig. 1 illustrates diagrammatically the apparatus fitted to what is known as the French card. It will be understood however that this does not restrict the apparatus to use with this particular type of carding engine only as it is within the scope of the invention to apply apparatus to other types of carding engines, such as a Yorkshire card. Fig. 2 of the drawings illustrates diagrammatically the full machine.

The existing breast worker and stripper of a French card are removed and in place of these are secured above the breast roller **10** a divider **11** which is in the form of a roller provided with an ordinary fillet surface **12**, the divider **11** being rotatably mounted in bearings **13** held adjustably in brackets **14** on the machine frame **15**. The adjustability is such that the divider **11** may be moved towards, or away from the breast roller **10**, as necessary. Held in a similar manner is a known type of brush or first stripper **16** which has a bristle covered surface, or brush fillet surface **17** which is located adjacent the divider **11** further away from the lickerin roller, than the divider. This first stripper **16** serves to remove the web (not shown) from the divider **11** and transfer it to a Morel roller **18** above which is located a burr-beater **19**. At the side of the Morel roller **18** remote from the first stripper **16** is located an angle stripper **20** having a brush fillet surface **21** which is adapted to transfer the web back on to the breast **10**. The arrangement of the divider **11**, the first stripper **16**, the Morel roller **18**, and the angle stripper **20** is such that the angle stripper **20** is angularly displaced from the divider **11** along the circumference of the breast roller **10** by an angle which is substantially less than 180°.

In use the position of the divider **11** is such relative to the breast **10** that it will divide the web coming from the lickerin into two parts. For example, the divider could be so set that 50% of the web is carried over the first stripper **16**, the remaining 50% of the web passing directly over the breast roller **10**. It is found convenient to have the divider **11** rotating in the opposite direction to the breast **10** and adjustable in relation thereto so that more or less than 50% of the web may be picked up and carried over this divider **11**. The part of the web carried by the divider **11** is picked up by the brush or first stripper **16** which rotates in the opposite direction to the divider **11**, and is transferred to the Morel roller **18** which rotates in the opposite direction to the brush and is passed below the burr-beater **19**. This burr-beater **19** removes the burrs in known manner, that is to say the burrs are held by the ends of the Morel wires (not shown) and the knives on the burr-beater (not shown) remove these and disperse them into a suitably located receptacle illustrated generally at **22**. From the Morel roller **18** the web passes on to the angle stripper **20** and is returned to the breast roller **10** where it is intermingled with that part of the web carried thereon, a further burr-removing process at a subsequent burr-removing location removing any burrs contained in that part of the web which has been carried by the breast **10** and not subjected to the above-described process.

When the apparatus is fitted to a Yorkshire card it is necessary to remove or displace the known divider in order that the divider **11** may be fitted, the position of this divider **11** being over the third lickerin.

In the example just described the sizes and surface speeds of the various rollers chosen to ensure efficient working of the machine are as follows:

	Diameter, inches	Surface Speed, feet per minute
Breast roller	27	352
Divider	9¼	24
First stripper	5⅞	46
Morel roller	9¼	56
Burr beater	5⅛	1,341
Angle stripper	5⅛	154

It will be evident that the sizes of the rollers can be varied proportionately to give the same surface speeds or varied to suit individual requirements to give the best surface speeds for the type of wool to be de-burred.

The action above described is such that the looser or more-opened part of the web remains on the breast roller **10**, whilst the more matted fibres on the points of the lickerin teeth are taken off by the divider **11**, opened gently by the brush or first stripper **16** and Morel roller **18**, and effectively de-burred by the burr-beater **19**. This part of the web is then returned to the lickerin **10** and re-unites with the other part of the web to form a substantially homogeneous web which then normally proceeds for further burr-beating before reaching the swift.

It is also within the scope of the invention to rotate the divider **11** in the opposite direction to that described and in this case this roller acts as a worker. When the roller rotates in the first-mentioned direction a smaller percentage of wool is carried thereby.

It will be noted that the whole assembly is compactly arranged for attachment to a lickerin or like roller and that the adjustment of the various parts give a desirable flexibility of action. When treating certain fine wools the assembly may quickly be taken out of action by adjusting the divider **11** away from the lickerin periphery.

Referring finally to Fig. 2 the whole machine is shown diagrammatically. Lickerin **10** is preceded by another lickerin *c* and feed rollers *a*, *b*, and followed by roller *d*, *e*, burr-beater *f* and swift *g*. Associated with lickerin **10** are the divider **11**, brush **16**, Morel roller **18**, burr-beater **19**, and angle-stripper **20**.

What I claim is:

1. A method of preparing wool fibers for carding, comprising the steps of advancing a web of fibers by means of a pre-opening roller; separating only an outer part of the web of fibers from said pre-opening roller while an inner part of said web of fibers continues to be advanced by said roller; removing burrs from said outer part of said web of fibers while it is separated from said roller; and then returning said outer part of said web, after it has been deburred, to said pre-opening roller to be united with said inner part of said web thereon.

2. A method of preparing wool fibers for carding, comprising the steps of advancing a web of fibers by means of a pre-opening roller; separating only an outer part of the web of fibers from said pre-opening roller while an inner part of said web of fibers continues to be advanced by said roller; removing burrs from said outer part of said web of fibers while it is separated from said roller; then returning said outer part of said web, after it has been deburred, to said pre-opening roller to be united with said inner part of said web thereon; and then removing the entire web from said pre-opening roller to subject the entire web to a further burr removing action.

3. An apparatus for treating wool fibers before carding, comprising, in combination, a pre-opening roller; a divider cooperating with said pre-opening roller for removing therefrom only an outer part of a web of fibers thereon; a Morel roller spaced from said divider and said preopening roller; a first stripper located between said divider and said Morel roller and cooperating with said divider and said Morel roller for removing said outer part of said web from said divider and for delivering said outer part of said web to said Morel roller; a burr-beater cooperating with said Morel roller for removing burrs from the part of the web delivered to said Morel roller by said first stripper; and an angle stripper located between and cooperating with said Morel roller and said pre-opening roller for removing the deburred outer part of said web from said Morel roller and for delivering the same back to said pre-opening roller to be reunited thereon with the inner part of the web which is not removed by said divider.

4. In apparatus for treating wool fibers before carding, comprising, in combination, a pre-opening roller; a divider cooperating with said pre-opening roller for removing therefrom only an outer part of a web of fibers thereon; a Morel roller spaced from said divider and said pre-opening roller; a first stripper located between said divider and said Morel roller and cooperating with said divider and said Morel roller for removing said outer part of said web from said divider and for delivering said outer part of said web to said Morel roller; a burr-beater cooperating with said Morel roller for removing burrs from the part of the web delivered to said Morel roller by said first stripper; an angle stripper located between and cooperating with said Morel roller and said pre-opening roller for removing the deburred outer part of said web from said Morel roller and for delivering the same back to said pre-opening roller to be re-united thereon with the inner part of the web which is not removed by said divider; and adjusting means cooperating with said divider for moving the same away from said pre-opening roller to a rest position where said divider is incapable of removing any fibers from said pre-opening roller so that said divider, first stripper, Morel roller, burr-beater, and angle stripper are rendered inoperative by locating said divider in said rest position thereof, and for moving said divider back to an operative position where it cooperates with said pre-opening roller to remove an outer part of a web of fibers therefrom.

5. An apparatus for treating wool fibers before carding, comprising, in combination, a pre-opening roller; a divider cooperating with said pre-opening roller for removing therefrom only an outer part of a web of fibers thereon; a Morel roller spaced from said divider and said pre-opening roller; a first stripper located between said divider and said Morel roller and cooperating with said divider and said Morel roller for removing said outer part of said web from said divider and for delivering said outer part of said web to said Morel roller; a burr-beater cooperating with said Morel roller for removing burrs from the part of the web delivered to said Morel roller by said first stripper; an angle stripper located between and cooperating with said Morel roller and said pre-opening roller for removing the deburred outer part of said web from said Morel roller and for delivering the same back to said pre-opening roller to be reunited thereon with the inner part of the web which is not removed by said divider, said divider, first stripper, Morel roller, and angle stripper respectively having parallel axes which are parallel to the axis of said pre-opening roller and which are angularly displaced in succession one after the other about the axis of said pre-opening roller.

6. An apparatus for treating wool fibers before carding, comprising, in combination, a pre-opening roller; a divider cooperating with said pre-opening roller for removing therefrom only an outer part of a web of fibers thereon; a Morel roller spaced from said divider and said pre-opening roller; a first stripper located between said divider and said Morel roller and cooperating with

said divider and said Morel roller for removing said outer part of said web from said divider and for delivering said outer part of said web to said Morel roller; a burr-beater cooperating with said Morel roller for removing burrs from the part of the web delivered to said Morel roller by said first stripper; an angle stripper located between and cooperating with said Morel roller and said pre-opening roller for removing the deburred outer part of said web from said Morel roller and for delivering the same back to said pre-opening roller to be reunited thereon with the inner part of the web which is not removed by said divider, said Morel roller being located between said burr-beater and said pre-opening roller.

7. An apparatus for treating wool fibers before carding, comprising, in combination, a pre-opening roller; a divider cooperating with said pre-opening roller for removing therefrom only an outer part of a web of fibers thereon; a Morel roller spaced form said divider and said pre-opening roller; a first stripper located between said divider and said Morel roller and cooperating with said divider and said Morel roller for removing said outer part of said web from said divider and for delivering said outer part of said web to said Morel roller; a burr-beater cooperating with said Morel roller for removing burrs

from the part of the web delivered to said Morel roller by said first stripper; an angle stripper located between and cooperating with said Morel roller and said pre-opening roller for removing the deburred outer part of said web from said Morel roller and for delivering the same back to said pre-opening roller to be reunited thereon with the inner part of the web which is not removed by said divider, said divider, first stripper, Morel roller, and angle stripper respectively having parallel axes which are parallel to the axis of said pre-opening roller and which are angularly displaced in succession one after the other about the axis of said pre-opening roller, and said angle stripper being angularly displaced from said divider along the circumference of the pre-opening roller by an angle which is substantially less than 180°.

References Cited in the file of this patent

UNITED STATES PATENTS

1,612,581	Holden	Dec. 28, 1926
2,189,519	Harrison et al.	Feb. 6, 1940

FOREIGN PATENTS

11,050	Germany	Oct. 12, 1880