Dec. 13, 1938. P. SCHWARZE 2,139,859

CARDING, CLEANING, OPENING, AND LIKE MACHINE FOR TEXTILE FIBERS

Filed March 21, 1935 2 Sheets-Sheet 1



Fig. 1



Fig 2

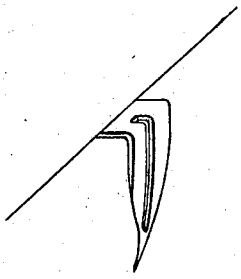


Fig. 3

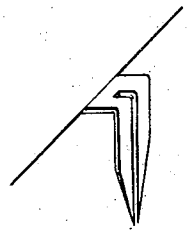


Fig 4

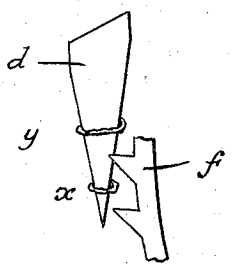



Fig. 8

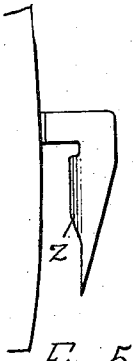



Fig. 5

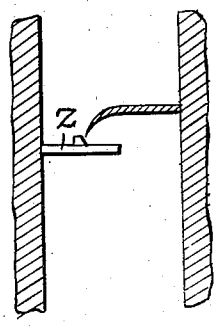



Fig. 6

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CARDING, CLEANING, OPENING, AND LIKE MACHINE FOR TEXTILE FIBERS

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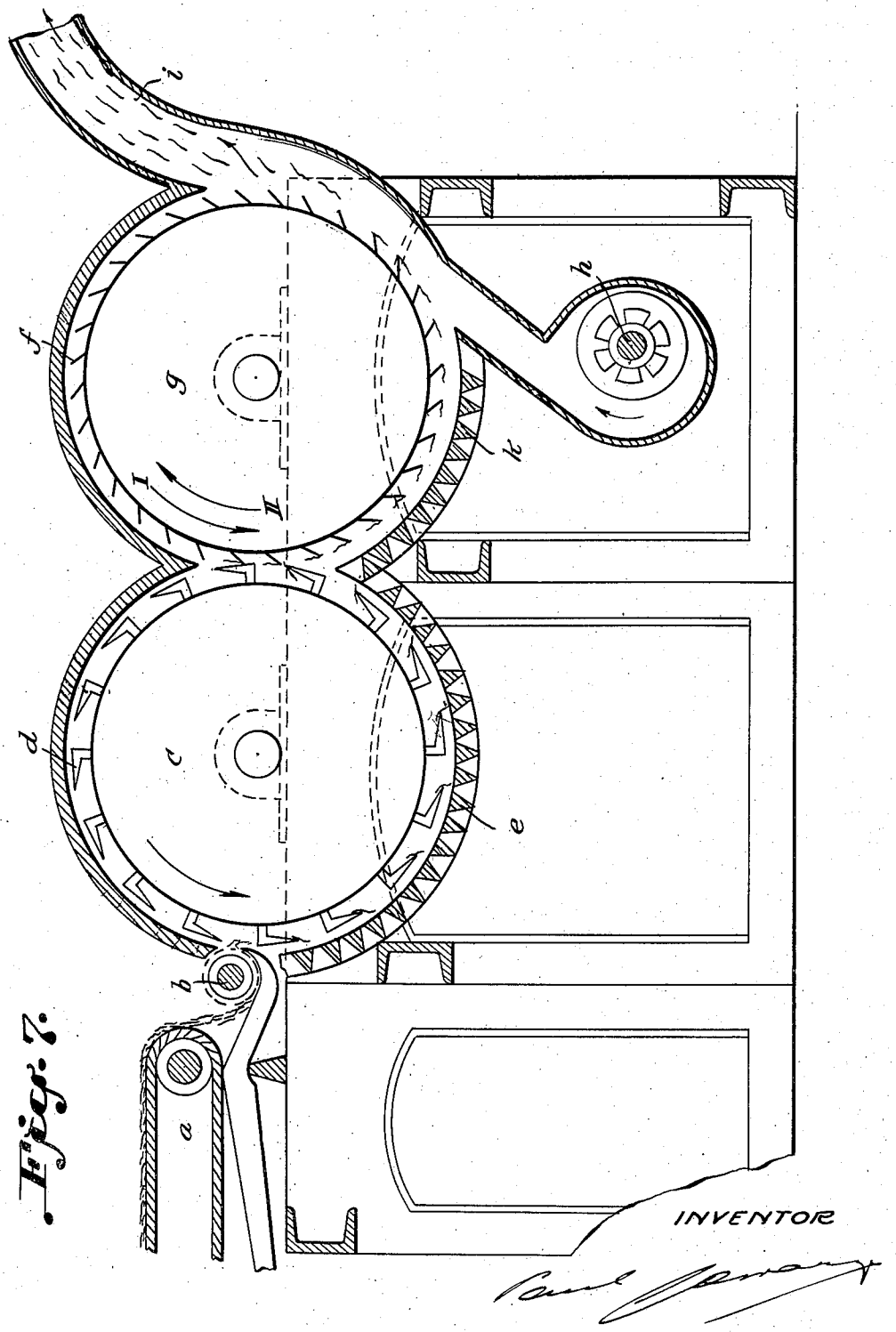



Fig. 2.

INVENTOR

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# UNITED STATES PATENT OFFICE

2,139,859

## CARDING, CLEANING, OPENING, AND LIKE MACHINE FOR TEXTILE FIBERS

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Application March 21, 1935, Serial No. 12,134
In Germany March 29, 1934

5 Claims. (Cl. 19—99)

Carding, cleaning, opening and like machines for textile fibers are known which consist of two coacting rotatable cylinders and in which the tangentially disposed teeth of the feed or teasing cylinder are provided with outwardly facing channels through which channels the teeth of the stripping or doffing cylinder are arranged to pass, as shown in the United States Letters Patent 2,014,673.

The object of the present invention is to improve this arrangement with a view to making it more suitable and efficient for dealing with certain kinds of fibrous material and to simplify the construction.

According to the present invention at least two cylinders are used, one of which, the feed or teasing cylinder, receiving the fiber from the feed apparatus, has teeth approximately tangential to the cylinder, the teeth being formed of pointed plates and the other cylinder, the stripping or doffing cylinder, has teeth which are arranged opposite the pointed plates and which by relative movement of the two cylinders are caused to pass the pointed plates in close proximity, thereby moving the fibers from the tips of the pointed plates towards their widening parts and ultimately carrying them away.

The pointed plates may be arranged with their flat sides parallel or transversely to the axis of the feed or teasing cylinder. Their lateral portions may be bent to either side in longitudinal direction, the object being to assure better and more sparing stretching of the fibers and to reinforce the teeth. The reinforcement can also be effected by providing one or more longitudinal ribs, preferably disposed on the side of the teeth facing the cylinder. Alternately the pointed plates may be provided with a longitudinal slit wherein the teeth of the stripping cylinder are adapted to engage.

In the accompanying drawings the invention is illustrated by way of example.

Figs. 1 and 2 show the flat tooth in side and front elevation respectively.

Fig. 3 is a perspective view of the flat tooth with longitudinal slit and backbent point.

Fig. 4 is a perspective view of a two part tooth, with a longitudinal slit extended to the point, double points being thus formed.

Fig. 5 is a side elevation of a transversely disposed flat tooth.

Fig. 6 is a plan view of a transversely disposed flat tooth and a sectional view of a laterally bent or set take-off tooth.

Fig. 7 is a vertical section of an opening machine of the same type as shown in the United States Letters Patent 2,014,673 with a pair of cylinders having teeth in accordance with the invention.

Fig. 8 illustrates diagrammatically the manner in which a tooth on the teasing cylinder, formed by a pointed plate, cooperates with saw teeth on the stripping cylinder.

Referring first to Fig. 8, *d* designates a tooth on the teasing cylinder formed of a pointed plate. When the point engages the fiber a coil *x* of fiber is formed thereon and slips onto the tooth to a position such as indicated at *y*. The teeth *f* of the stripping cylinder which are adapted to pass opposite the pointed plate *d* in near proximity cause the coils of fiber to be moved from *x* or *y* further to the widening portion of the pointed plate *d*. Thereby the fiber is loosened and stretched very considerably and is ultimately removed from the pointed plate *d* and carried away by the teeth *f*.

The form of tooth shown in Figs. 1 and 2 is employed with advantage in the case of hard pressed long stapled fibers, such as those of the best Egyptian cotton, or in the case of cottonized flax fibers which are stuck together as a result of chemical opening. In the case of such fibers the teeth engage comparatively large lumps of material, and in this connection it is of advantage not to allow the teeth of the stripping cylinder to approach too close to the feed or teasing cylinder, so as to prevent the fibers from being torn. Obviously, the fibers will then not be opened so well, but in many cases, for example with the aforesaid kinds of fibers, it is advisable to effect first of all a kind of preliminary opening to spare the fibers and this, as experiments have shown, can be very efficiently accomplished with the flat teeth shown in Figs. 1 and 2.

An effect similar to that of channelled teeth may be achieved if the flat teeth are provided with longitudinal slits wherein the teeth of the stripping cylinder are adapted to engage. Fig. 3 shows a tooth formed of a pointed plate with a longitudinal slit of which the point is bent backwards towards the cylinder in order to assure good engagement of the teeth of the stripping cylinder. Fig. 4 shows a modification in which the slit is extended right through to the point of the tooth, so that in a way a tooth divided into two parts is produced, that is to say a tooth having two points disposed in close proximity. In this case both points would engage a tuft of fiber, and these tufts would be stretched and taken off in the manner already described by the

teeth of the stripping cylinder which move along the slit. This embodiment is technically simpler than channeled teeth.

Figs. 5 and 6 show the tangentially disposed tooth of the teasing cylinder arranged with the flat side transversely to the axis of the cylinder, *z* designating a reinforcing rib. In this case the teeth of the stripping cylinder which effect the stretching and doffing of the fibers are so disposed as to pass laterally by the teeth of the teasing cylinder, it being of advantage to bend or set the teeth of the stripping cylinder towards the teeth of the teasing cylinder. The transverse disposition of the teeth is of particular advantage if short fiber material is to be dealt with, and more especially if in such cases small diameter cylinders are utilized. In these cases it may occur that owing to the rotary movement of the cylinders the fiber tufts received from the feed device are so engaged by the teeth of the teasing cylinder that a large proportion of said tufts becomes lodged at the rear, i. e. on that side of the teeth which faces the cylinder. If in such cases the material is short fibered it will not be sufficiently pulled forward and properly taken off by the teeth of the stripping cylinder. This defect which frequently causes choking of the teasing cylinder is eliminated by the transverse disposition of the teeth, since the teeth adapted to take off the fibers seize same from the side and since it is possible in this way to partly supply the stripping cylinder with teeth which extend to the base of the pointed plates or the surface of the teasing cylinder whereby they remove any fibers which become lodged there. By bending the sides of the transversely disposed pointed plates channels may be formed which face sideways.

Referring now to Fig. 7, *a* and *b* designate a feed apparatus of a well known type. The cylinder *c* has teeth *d* of the kind shown in Fig. 1 to 6 and is rotated as indicated by an arrow at a speed depending on the output and the degree of the opening required. *e* and *k* are grids. By the engagement of the teeth *d* with the fiber supplied by the feed roller *b* tufts of fiber are collected and carried along the grid *e* into proximity with the teeth *f* of the second or stripping cylinder *g*. This cylinder *g* rotates either as indicated by the arrow I or as indicated by the arrow II but in any case there is a relative movement between the two cylinders causing the tufts of fibers on the teeth *d* to be moved by the teeth *f* from the tips of the teeth *d* towards their widening part wheerby the coils of fiber formed on their tips are stretched and taken off by the teeth *f* of the cylinder *g*. The fibers on the teeth *f* are then carried to the delivery end of the machine where a stream of air created by a fan *h* carries them into a delivery duct *i* through which they pass to sieve drums and winding apparatus in the usual way. Means other than a fan of any suitable kind may be used for tking the fibers from the teeth *f*. The grid *k* comes only into operation if the cylinder *g* rotates as indicated by the arrow I.

The teeth in the form of pointed plates may be fixed to the teasing cylinder in any suitable manner. The flat form of tooth makes it possible to effect the fixing in a simple manner with only one foot strap.

What I claim as my invention and desire to secure by Letters Patent of the United States is:

1. A machine for opening, cleaning, carding or like treatment of textile fibers, having in combination two coacting rotatable cylinders, one of said cylinders having approximately tangential teeth, comprising pointed plates being provided with longitudinal slits, and the other cylinder having teeth arranged to pass through the slits of said slotted teeth.

2. A machine for opening, cleaning, carding or like treatment of textile fibers, having in combination two coacting rotatable cylinders, one of said cylinders having approximately tangential teeth, comprising pointed plates being provided with longitudinal slits extended to the points in such a manner that double teeth with two points are formed, and the other cylinder having teeth arranged to pass through the slits of said slotted teeth.

3. A machine for opening, cleaning, carding or like treatment of textile fibers, having in combination two coacting rotatable cylinders, one of said cylinders having approximately tangential teeth, comprising pointed plates being disposed with their flat sides transversely to the axis of the cylinder, and the other cylinder having teeth arranged to pass laterally by said transversely disposed teeth and in such manner, that by relative movement of the two cylinders the fibrous material on said transversely disposed pointed plates is caused by the teeth of the second cylinder to move from the tips of said plates to their widening parts and is then taken off.

4. A machine for opening, cleaning, carding or like treatment of textile fibers, having in combination two coacting rotatable cylinders, one of said cylinders having approximately tangential teeth, comprising flat pointed plates, and the other cylinder having laterally bent teeth arranged opposite said pointed plates and adapted in such manner that by relative movement of the two cylinders the fibrous material on said pointed plates is caused by the teeth of the second cylinder to move from the tips of said pointed plates towards their widening parts and is then taken off.

5. A machine for opening, cleaning, carding or like treatment of textile fibers, having in combination two coacting rotatable cylinders, one of said cylinders having approximately tangential teeth, comprising flat pointed plates, and the other cylinder having teeth arranged opposite said pointed plates and adapted in such manner that by relative movement of the two cylinders the fibrous material on said pointed plates is caused by the teeth of the second cylinder to move from the tips of said pointed plates towards their widening parts and is then taken off.

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