Aug. 6, 1968 A. S. VINOGRADOV ETAL 3,395,425

CARD

Filed Nov. 9, 1966 2 Sheets-Sheet 1

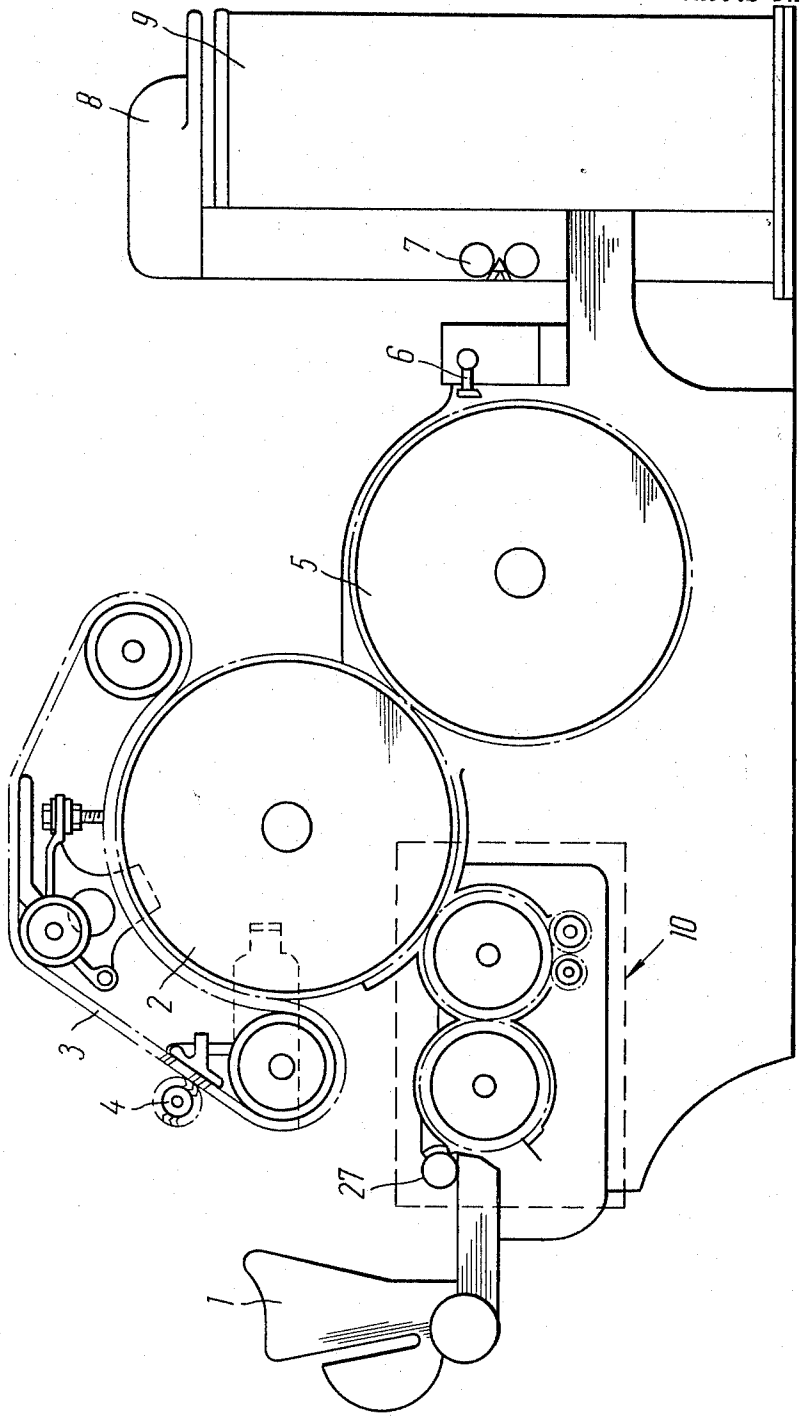
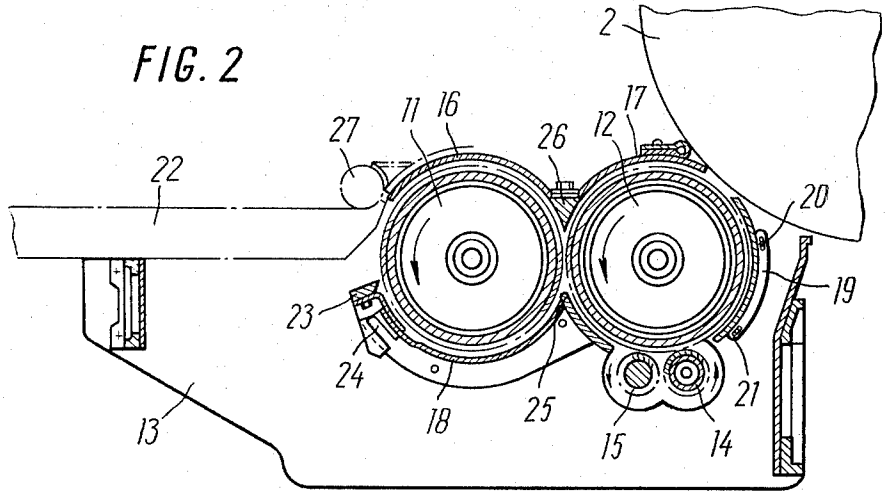


FIG. 1

FIG. 2



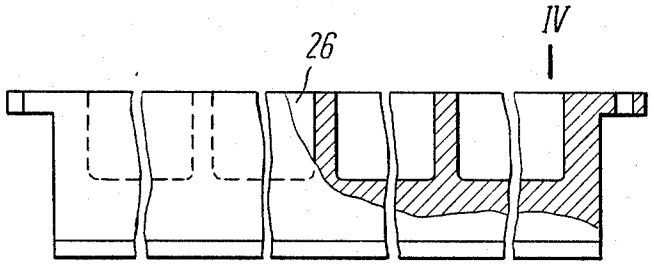


FIG. 3

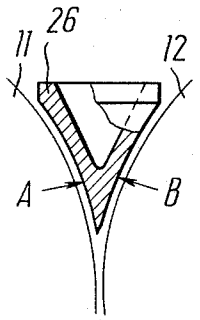


FIG. 4

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CARD

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ABSTRACT OF THE DISCLOSURE

A card machine in which one part of a pan is arranged beneath the receiver cylinder and extends in part below the transfer cylinder up to a pair of operating rollers arranged beneath the transfer cylinder, a second part of the pan extending as a shield between the pair of working cylinders and the main cylinder and adjustable between the rollers and main cylinder.

The present invention relates to devices for carding and cleaning cotton fibers, and more particularly to cards used in the textile industry.

There is already known a card which comprises a receiver unit constituted of a toothed receiver cylinder and a toothed transfer cylinder enclosed in a housing and arranged in a horizontal plane, and wherein a trash stripper knife is arranged in the working zone of the feeding table (see, for instance, Patent No. 96,750, class 75*b*, 10, issued in the U.S.S.R.).

The disadvantage presented by this card is the low cleaning capacity of the receiver unit which affects the efficiency of the card and impairs carding quality.

Moreover, the receiver cylinder and transfer cylinder which are enclosed in a housing do not ensure stabilization, normal outlet and elimination of air currents affecting the structure of the web transferred to the main cylinder and the efficiency of the card as a whole.

The principal object of the present invention is the provision of a card having a receiver unit of a high carding capacity ensuring a good stabilization and a normal outlet of air currents, and a good quality of web at a high card efficiency.

Having in view the aforementioned and other objects, the present card is provided with a receiver unit comprising a toothed receiver cylinder and a toothed transfer cylinder enclosed in a housing and arranged in a horizontal plane and a trash stripper knife disposed in the zone of the machine feeding table.

According to the invention, a pair of operating rollers is arranged under the transfer cylinder, and at the top between the cylinders there is provided a knife which together with a pan enveloping the cylinders from the bottom, changes the distribution of the directed air flow.

It has proved expedient to make the pan of two parts, one of which is disposed under the receiver cylinder and carries the trash stripper knife and partly occupies the space under the transfer cylinder up to the pair of operating rollers.

The other part of the pan is made as a shield arranged between the pair of operating rollers and the main cylinder and adjustable between the pair of operating rollers and the main cylinder. The knife between the cylinder has a wedge shape with exterior surfaces concentric relative to the surfaces of the cylinders, and in cross section it has a bevel defining an asymmetrical shape allowing the approach of the knife blade to the receiver cylinder.

In the proposed card, the receiver unit ensures good carding and cleaning of fibers, is reliable in operation and convenient in exploitation and ensures stable operation of the card and high efficiency thereof.

Other objects and advantages presented by the present invention will be rendered more fully apparent by the following description of an exemplary embodiment of the card, taken in conjunction with the accompanying drawings, wherein:

FIG. 1 is a diagrammatic illustration of the card according to the invention;

FIG. 2 is a diagrammatic illustration partly in section of the receiver unit according to the invention;

FIG. 3 is a side view of a knife according to the invention; and

FIG. 4 is a cross-sectional view, taken along the line IV—IV in FIG. 3.

A receiver unit **10** comprising a receiver cylinder **11** (FIG. 2) and a transfer cylinder **12** disposed on the card framework **13** in one horizontal plane, is installed on a card constituted of a feeding unit (FIG. 1), a main cylinder **2**, belts **3**, a belt stripping arrangement **4**, a doffer **5**, a doffing comb **6**, delivery rollers **7**, and a coiler **8** for coiling the lap into a container **9**.

In order to increase the carding efficiency of the receiver unit **10**, there is provided under the transfer cylinder **12**, a pair of operating rollers composed of a working roller **14** and a cleaning roller **15**.

The receiver cylinder **11** and transfer cylinder **12** are closed from the top with a housing composed of two segments **16** and **17**, and from the bottom the cylinders are enveloped by a pan.

The pan is made up of two parts **18** and **19** manufactured of solid sheets without perforations.

The part **18** of the pan is disposed under the receiver cylinder **11** and partly under the transfer cylinder **12** up to the pair of operating rollers **14** and **15**. The other part **19** of the pan is made as a shield arranged on the framework **13** between the pair of operating rollers and the main cylinder **2** with the possibility of adjusting the position of the shield between the pair of rollers **14**, **15** and the main cylinder **2** by means of adjustment of the engagement of bolts **20** in elongated slots **21**, as shown in FIG. 2. This adjustment is necessary when carding various types of cotton fibers.

On the part **18** of the pan, in the zone of the feeding table **22**, there is arranged a trash stripper knife with a device **24** for adjusting its reach relative the feeding table **22** and receiver cylinder **11**.

The surface of part **18** of the pan is concentric relative to the surfaces of the transfer cylinder **12** and receiver cylinder **11**; a protrusion **25** is wedged in the space between the cylinders **11** and **12**.

At the top between the cylinders **11** and **12** (FIG. 2) there is arranged a knife **26** resting on the framework **13**.

The knife **26** (FIG. 3) is constituted as a wedge with exterior surfaces A and B (FIGS. 3 and 4) concentric relative to the surfaces of cylinders **11** and **12**.

The knife blade is formed with a surface A facing the receiver cylinder **11**, and a surface B which faces the transfer cylinder **12** and a bevel is formed at the lower end of surface B as shown in FIG. 4. Owing to this arrangement, the cross section of the knife **26** has an asymmetrical shape which allows placement of the knife blade closer to the receiver **11**. The gap between the blade of the knife **26** and the fillet of the cylinder **11** is considerably smaller than the clearance between the cutting edge of the knife **26** and the fillet of the transfer cylinder **12** when it is most deeply set between the cylinders. This permits a greater travel of the knife **26** towards the transfer cylinder in the event that a tuft of fiber is passed. Thereby, damage to the fillet of the transfer cylinder **12**

is minimized. Additionally, the air flow is essentially blocked from passing between the knife surface A and cylinder **11**, thereby avoiding interference with the passage of the web, whereas the air tends to flow between surface B and cylinder **12** in the direction of advance of the web.

The shape of the knife together with the pan **18** is thereby capable of changing the distribution of air currents in the zone between the receiver cylinder **11** and transfer cylinder **12**.

The card operates in the following way: The lap (not shown in the drawing) is fed along the feeding table **22** (FIGS. 1 and 2) under the feeding cylinder **27** which forwards it to the receiver unit **10**.

There the lap is consecutively subjected to the action of the two cylinders **11** and **12**, and of the pair of rollers **14** and **15**.

The cylinders **11** and **12**, as well as rollers **14** and **15**, are provided with a saw-toothed fillet.

The progressively fed cotton is carded by the teeth of the fillet covering on the receiver cylinder **11**. During this operation, the cotton fibers are separated into small bits with elimination of foreign impurities.

At the rapid rotation of the receiver cylinder **11**, foreign impurities which are heavier than the cotton fibers, will be thrown-off by centrifugal forces from the teeth of the fillet on the cylinder **11**, separated by the trash stripper knife **23** and finally fall under the machine.

The fibers from the cylinder **11** are grasped by the teeth of the fillet of the transfer cylinder **12**, which travel in a direction opposite to that of the cylinder **11** where they are contiguous and much slower.

Thereby, the fibers are additionally carded and equalized.

The transfer cylinder **12** passes the fibers onto the working roller **14**; the fillet teeth of roller **14** are directed towards the teeth of the fillet of the transfer cylinder **12**. The slowly rotating working roller **14** grasps the fibers from the transfer cylinder **12** and passes them to the cleaning roller **15**, which, in its turn, strips the working roller **14** and transfers the fibers again onto the cylinder **12**.

The rotational speed of the cleaning roller **15** is much faster than the speed of the working roller **14**, but much slower than the speed of the transfer cylinder **12**.

The fibers are transferred from the cylinder **12** onto the pair of rollers **14**, **15** until full carding of cotton fibers is obtained, and they are distributed in a uniform layer through the full width of the cylinder **12**, which considerably enhances the quality of sliver coming out of the machine.

This preliminary treatment of the fibers in the receiver unit facilitates the operation of the main cylinder **2** with belts **3** (FIG. 1), which ensures parallelization of fibers and the elimination of those fibers which contain foreign impurities.

Thus, the pair of rollers **14**, **15** arranged under the transfer cylinder **12**, increases the carding capacity of the receiver unit **10**.

During operation, on the surfaces of the rapidly rotating cylinder **11** and transfer cylinder **12** considerable centrifugal forces are created tending to throw-off the fibers from these cylinders. Air currents created by the rotation of the cylinder **11** and the transfer cylinder **12** further tend to throw-off the fibers from the cylinders.

For eliminating undesirable air currents as well as for their stabilization and avoidance of fiber ejection, the cutting edge of knife **26** is placed as close as possible to the teeth of the fillet on the cylinder **11**, and is at the same time deeply set in the gap between the cylinders **11** and **12**. Due to this arrangement, in the upper part of the receiver unit, the air currents produced by the rotation of cylinders **11** and **12** are redistributed and follow the travel of the web; and as a result, fluffiness of the web is obtained, and no fibers are blown away from the zone of the feeding table **22** and feeding cylinder **27**.

In the bottom part of the receiver unit **10**, the air current is directed by the pan, so that it flows in the sense of rotation of the cylinder **11**, meeting in its path the protrusion **25** and then the knife **26** whereby its speed is partially slowed down. The remaining part of the air current is taken-up by the transfer cylinder **12** (traveling in opposite direction to cylinder **11** where it is tangential thereto), and is definitely stopped in the zone of the rollers **14** and **15**.

After the air flow has been stabilized in the zones between the working roller and the main cylinder **2** (FIG. 1), as well as between the transfer cylinder **12** and shield **19**, the transfer cylinder **12** transfers the fibers to the main cylinder **2** without impairing the preset regularity and the structure of the carded web.

The housing **16** and **17** closes the receiver and transfer cylinders and the knife **26** from above, thus protecting the unit **10** from spontaneous ejection of fibers and dusting.

Further the operation of the card is effected in the usual way, i.e., the fibers fed onto the main cylinder **2** are subjected to cleaning, carding and parallelization by the co-action of needles of the fillet on the main cylinder **2** with the needles of belts **3**.

Non-carded fibers as well as fibers containing foreign impurities are removed by the belts **3** and eliminated by the device **4** as flat strips. Carded fibers are transferred by the main cylinder **2** to the doffer cylinder **5**, from which the fibers are doffed by the comb **6**, and are formed into a sliver by the delivery mechanism **7** and coiled by coiler **8** into the container **9**.

We claim:

1. In a card having a main cylinder, a receiver unit comprising a receiver cylinder; a transfer cylinder disposed downstream of the receiver cylinder in the same horizontal plane therewith; at least one pair of operating rollers located under the transfer cylinder and coacting with the latter; a feeding table arranged before the receiver cylinder for feeding a lap thereto; trash stripper means arranged in the region of the feeding table; a pan enveloping the receiver and transfer cylinders from below; a housing covering the receiver and transfer cylinders from above and a knife installed from above between the receiver and transfer cylinders and cooperating with the pan and housing to effect a re-distribution of the air flow, said pan being constituted of two parts, one of which is arranged under the receiver cylinder and carries the trash stripper means, and partly occupies the space under the transfer cylinder up to the pair of operating rollers, the other part of the pan being a shield arranged between the pair of operating rollers and the main cylinder and having means for adjusting the position of the shield between the pair of rollers and the main cylinder.

2. A card as claimed in claim **1** wherein said knife has a wedge shape with surfaces respectively concentric to the receiver and transfer cylinders, said knife having a bevel edge on the surface concentric with the transfer cylinder and being placed closer to the receiver cylinder than the transfer cylinder.

3. A card as claimed in claim **1** wherein one of the pair of operating rollers is a working roller having teeth thereon and the other roller is a cleaning roller.

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