Aug. 29, 1950 H. M. BACON 2,520,192

WOOL CARD RUB APRON

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Fig. 1.

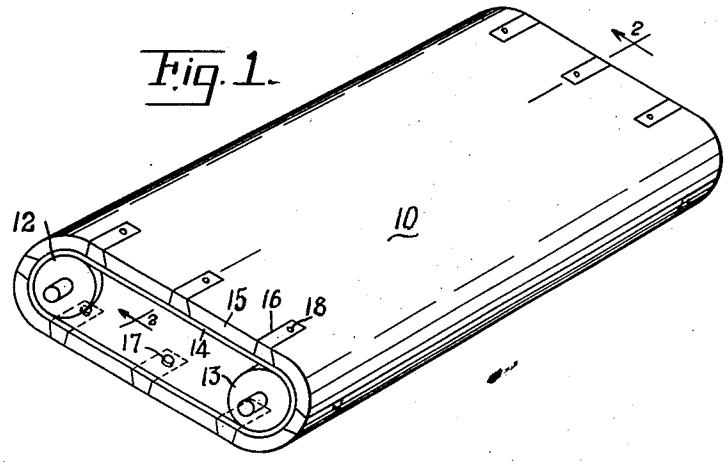


Fig. 2.

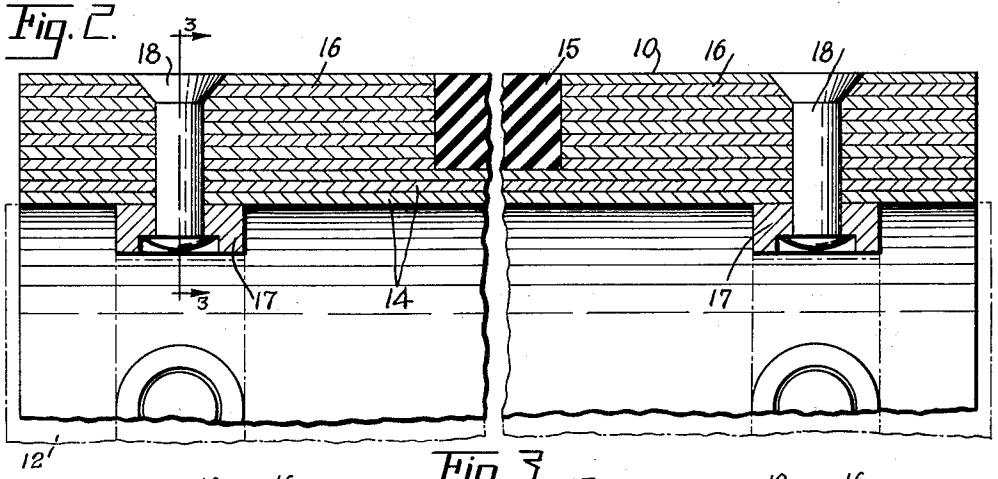


Fig. 3.

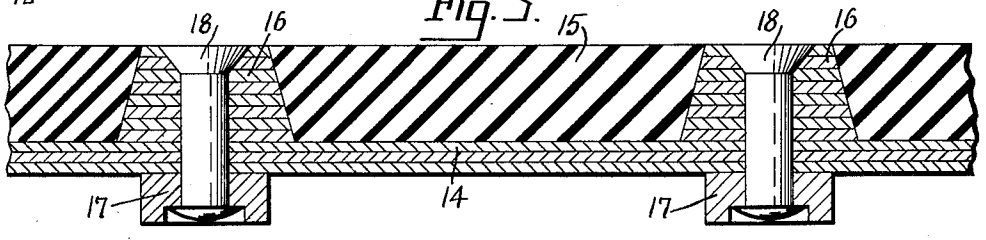
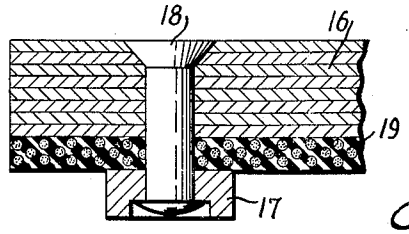


Fig. 4.



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WOOL CARD RUB APRON

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9 Claims. (Cl. 19—153)

1

This invention relates to aprons for textile cards, and particularly to rub aprons for wool cards.

Aprons are used in the spinning process for carrying and conveying the textile fabrics and preforming and compressing them at the same time before the spinning operation proper. They are endless belts which are driven by a pair of rollers.

For a long time leather was the only material found suitable for such aprons. However, there were several drawbacks connected with their use. Leather aprons are of relatively uneven thickness, and thus the yarn produced with them has a very un-uniform cross-section. The gripping power of leather is relatively low, and special surface designs have to be provided in order to increase the friction. Leather aprons also dry out easily and therefore lose their flexibility. Oiling is the only remedy for this, but oiled aprons, are liable to cause soiling of the thread. Leather also absorbs colors and dyes readily, a fact which is very disadvantageous in the case of frequent changes between yarns of different colors, particularly when light colored or white yarns are treated after some darker colored material. In such instances light colored materials are soiled by colors which the apron had absorbed from the thread of the previous batch. Furthermore, leather aprons are liable to become charged with static electricity, particularly in the beginning of their use, which necessitates their treatment with water at intervals. Furthermore, leather aprons vary a great deal as to their degree of expansibility and therefore are hard to adjust. In order to overcome this latter disadvantage, it has been necessary to attach buttons on the inner surface of the leather apron near the outer edge, which extends beyond the shoulders of the rollers.

One of the advantages of leather aprons is their great strength, which is especially valuable if buttons as described above are fastened on the aprons. The high tensile strength and durability of leather prohibits a premature wearing out of the apron by the rivets or other fastening means for the buttons. Another very desirable property of leather for aprons is its high degree of flexibility and thus adjustability to the shape of the rollers, even on the edges which extend beyond the shoulders of the rollers. Abrasive wear at the side of the apron is thus reduced to a minimum.

Later on, rub aprons were made of synthetic materials such as synthetic rubbers. These

2

aprons of synthetic materials were free from some of the disadvantages which are encountered in leather aprons. There still were found a number of undesirable properties in the use of rubber aprons. Rubber aprons have to be built up on a fabric-containing base in order to reduce their elasticity. This fabric base, however, does not give the aprons sufficient grip, so that such aprons are liable to "travel" on the rollers. For this reason, retaining buttons have to be applied on the roller-contacting surface of the aprons. These buttons however, exert a high strain on the fabric base of the apron and very frequently tear off the fabric base so that the buttons become loose after a short while and not infrequently are lost during operation. For this reason it has been tried to use a more resistant and stronger base for such aprons of rubber or other synthetics, but such aprons have been found unsatisfactory, also because their flexibility, one of their most important properties was greatly impaired by the stiffness of the fabric. If the flexibility is not sufficient, the contact and grip with the rollers is incomplete; besides, the ends of the aprons, which extend beyond and are not supported by the shoulders of the rollers, have a tendency to return to a round shape, and this causes an excessive degree of pressure and consequently excessive wear.

According to the present invention, an apron is produced which is free from all of the drawbacks which have been mentioned above and which is characterized by good gripping action, a high degree of flexibility and at the same time by high tensile strength and long service life.

The invention will be more clearly understood from the following description taken in connection with the annexed drawings, in which:

Fig. 1 is a perspective view of an apron according to the invention mounted on the rollers;

Fig. 2 is a fragmentary longitudinal section of the apron on an enlarged scale, taken along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary longitudinal section of a modified embodiment of this invention.

Referring more particularly to the drawings, 10 designates an apron mounted on a pair of rollers 12 and 13. The apron is formed of a fabric base 14 which, in the case of the drawing, consists of three layers of a relatively flexible fabric material. Over the base layers of the apron, the body portion 15, consisting of a synthetic rubber composition, is applied. This body portion 15 is

preferably made several times thicker or higher than the base layer 14, as shown in the drawing. Extending from the edges of the apron towards the longitudinal axis of the apron (Fig. 1) there is arranged a plurality of inserts 16 which are made of a relatively heavy, tear resistant fabric. These inserts 16 may be bound into the apron by the rubber composition of the body portion or may be attached by some other suitable means. The inserts are preferably equidistantly disposed; however, this arrangement does not have to be observed necessarily. The numeral 17 designates the retaining buttons which are attached to the belt at intervals and protrude from the inner surface close to the side edges of the apron. The buttons are fastened to the apron by bolts or rivets 18 which extend along the entire circumferential edge of the apron at the points reinforced by the insert 16.

In the modification shown in Fig. 4, the inner base layer is not formed of fabric, but of a layer of synthetic rubber composition which is reinforced by cords running parallel with the longitudinal axis of the apron.

Aprons made according to this invention have the advantage that while they have a maximum of flexibility and softness as a whole, they still offer a sufficiently strong support for the retaining buttons and have a high degree of tear resistance which is so important particularly in view of the rivets or bolts by which the buttons are fastened to the apron. Furthermore, the aprons made according to this invention exhibit good gripping characteristics and a relatively low degree of abrasive wear. Due to their high flexibility, they adjust themselves easily to the shape of the rollers over which they run.

The body portion of the aprons may be made of any kind of synthetic material known to those skilled in the art. However, synthetic rubbers such as neoprene and Perbunan, and materials predominantly containing such synthetic rubbers have proven especially satisfactory. Copolymers of acrylic nitrile and butadiene have proved particularly satisfactory.

The inner roller-contacting surface of the apron may be made of any kind of flexible inelastic material. One of several layers of fabric or rubber coated fabric is suitable. A layer of cord-reinforced rubber material with the cords running parallel with the longitudinal axis of the apron may be used also with satisfactory results. It has been found that if the cords are wound starting from the center and progressing towards the outside of the belt, the stresses and strains in the inner roller-contacting layer and thereby the tendency of the apron for traveling on the rollers are considerably reduced. For the same reason it is advantageous, if several layers of fabric are used as the inner base of the apron, to alternate between one tightly and one loosely wound layer. Thus in addition to the reduction of stresses and strains, the flexibility is increased, while a low degree of elasticity is retained. The same effect may be attained by alternating between a straight laid woven fabric layer and a bias laid woven fabric layer. It has also been found that a belt with practically no tendency for traveling is obtained by allowing the stresses of the fabric to adjust themselves before their use for building the belt. This balancing of the stresses can be accomplished by rolling and re-rolling the fabric in different directions prior to its use for building up the belt. Festooning of the fabric on racks in the open air has also given satisfactory results.

In cases where several fabric layers are used, it has been found advantageous for the purpose of good running qualities, to stagger the splice and to reverse the ends by turning each piece of fabric around 180° in order to compensate for any unevenness or unbalance in the fibers.

The inserts may be made of the same fabric material as the inner base layer. However, since high flexibility is required for the base layer and high stiffness and strength are required for the inserts, it is preferable to make the inserts from a stiffer and coarser kind of fabric than that of the base layer. The inserts may also be made of leather or other suitable tear resistant materials.

The buttons may be advantageously made of fabric, leather, plastics, cord-reinforced rubber, fiber, hard rubber, textile reinforced rubber composition such as "Stiflex," or other suitable materials within the scope of this invention.

Likewise, the buttons may be fastened to the inserts by any other suitable means than those shown in the drawings.

It will be understood that while there have been described herein certain specific embodiments of the invention, it is not intended thereby to have the invention limited to or circumscribed by the specific details of construction or arrangement of parts, materials or procedures herein described or illustrated in the drawing by way of example, in view of the fact that the invention is susceptible to modifications according to individual preference or conditions without departing from the spirit of this disclosure and the scope of the appended claims.

I claim:

1. An apron for textile processing comprising a flexible inner fabric base, a body of flexible rubber composition adjacent said base co-extensive therewith and extending to the edges thereof, a plurality of retaining buttons on the inner surface of said base, a plurality of inserts of high tear resistant and relatively inflexible material spaced along and adjacent both edges of the apron incorporated in said body thereof, and means extending through said inserts for fastening said buttons thereto.

2. An apron according to claim 1 wherein the inner fabric base comprises a plurality of layers of fabric.

3. An apron according to claim 1 wherein the inner fabric base comprises a plurality of layers of fabric, said layers comprising a straight-laid woven fabric layer and a bias-laid woven fabric layer.

4. An apron for textile processing comprising an inner stress free, flexible, and inelastic base layer, a body of flexible rubber composition integrally united with said base being co-extensive therewith and extending to the edges thereof, a plurality of retaining buttons on the inner surface of said base spaced along the edges thereof, a plurality of inserts of highly tear resistant and relatively inflexible material spaced along and adjacent both edges of the apron incorporated in said body thereof, and means for fastening said buttons to said inserts.

5. An apron according to claim 4 wherein the inner base layer is composed of rubber composition having cords parallel with the longitudinal axis of said apron embedded therein.

6. An apron according to claim 4 wherein the base layer comprises a body of rubber composi-

tion having cords wound parallelly to the longitudinal axis of said apron and spirally from the center progressing toward the outside edges of the apron and embedded in said rubber composition.

7. An apron according to claim 4 wherein the retaining buttons are composed of metal.

8. An apron according to claim 4 wherein the retaining buttons are composed of wear resistant and cord reinforced rubber.

9. An apron according to claim 4 wherein the retaining buttons are composed of leather.

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