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ENDLESS BAND FOR POLISHING

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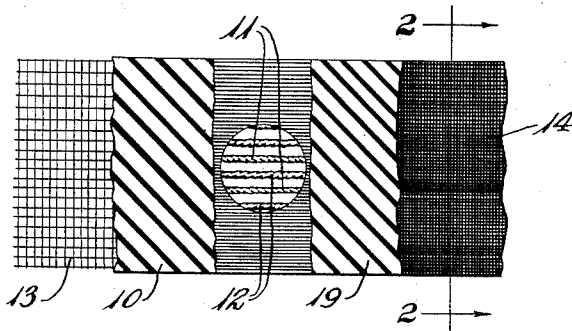


Fig-1

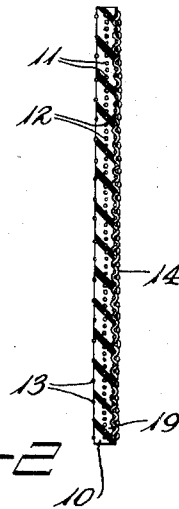


Fig-2

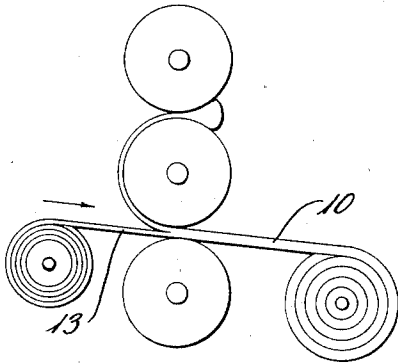


Fig-3

Fig-4

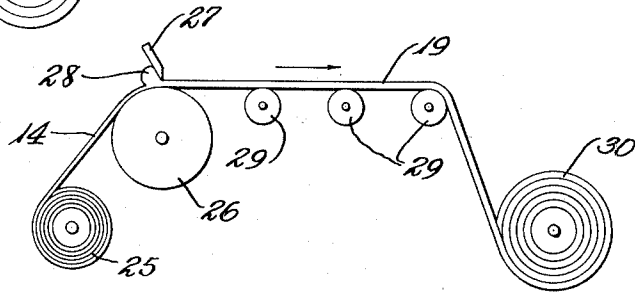
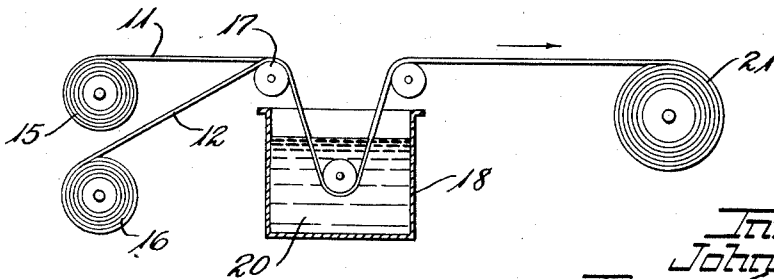


Fig-5



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ENDLESS BAND FOR POLISHING

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4 Claims. (Cl. 154—52)

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This invention relates to endless bands for supporting polishing materials and is especially useful as a flexible backing for supporting a layer of abrasive material for operation at high speed.

In the polishing of metal and other articles, it has been heretofore proposed to mount abrasive material by means of an adhesive to an endless thin band of paper or cloth. Such bands in use have been operated at high speeds over small drums or pulleys and have usually been discarded upon loss of abrasive particles or gumming of the abrasive surface. Where such bands have been used in contact with material having hard sharp corners or burrs, such belts have been cut or torn often before the abrasive has become inefficient due to wear or loading with abraded material.

It is an object of the present invention to provide an endless flexible band having high resistance to tearing and which is adapted to receive an abrasive coating.

Other objects are to provide for operation at high speed, to provide a band suitable for repeated coating with abrasive material, and to provide superior flexibility.

These and other objects will appear from the following description and the accompanying drawings.

Of the drawings:

Fig. 1 is a plan view of a portion of the finished band with the layers of material broken away in steps and a portion of the cord layer being shown to an enlarged scale.

Fig. 2 is a cross sectional view thereof, taken on line 2—2 of Fig. 1, the band being shown greatly enlarged in thickness to illustrate its construction.

Fig. 3 is a diagrammatic view of a calender showing the manufacture of the rubber backing layer.

Fig. 4 is a diagrammatic view showing the coating of the face fabric.

Fig. 5 is a diagrammatic view showing the coating of the cords.

Referring to the drawings, the numeral 10 designates a backing layer of rubber or other rubber-like material on the face of which parallel cords 11, 12 are laid longitudinally of the band in parallel relation. The cords preferably are alternately of right and left twist in order to balance each other and prevent running of the band to one side. Cords of 1650 s two ply rayon have given good results. The backing layer 10 is preferably of oil-resisting material such as neoprene and is calendered as shown in Fig. 3 to a thickness of about .010". In order to support

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the backing layer against stretching, it may be calendered on a layer of cheesecloth 13 which has little strength and is expendible during use of the belt.

The cords are preferably treated with a suitable material to promote adhesion and are then coated with a dispersion of rubber or other rubber-like material. As shown in Fig. 5, the cords 11 of right hand twist may be drawn from one beam 15 and the cords 12 of left hand twist may be drawn from a second beam 16, the cords being assembled in intercalated relation and passed over a roll 17 through a tank 18 in which the coating liquid 23 is applied. The cords may then be dried and wound upon a roll 21 and are ready to be applied to the backing layer. This may be accomplished by passing the two layers between pressure rollers.

The face layer 14 of the band is a thin layer of square-woven fabric such as balloon cloth. The fabric has a coating 19 of rubber or other rubber-like composition on one face for securing it to the cord layer and is uncoated on its exposed face so as to provide a raw fibrous face to which abrasive material may be applied. This face layer should be somewhat extensible so as to permit the band to pass about pulleys of small diameter without assuming any substantial amount of load under tension, it being desired that the entire tension load be carried by the cord layer. In order to retain all of the extensibility present in the uncoated cloth, it is preferred to coat this fabric by spreading rather than calendering. As seen in Fig. 4, the face layer fabric 14 is unwound from a roll 25 and passed about a roller 26. A doctor blade 27 applies the coating 19 from a bank 28. The fabric with the coating thereon is dried, as over supporting rollers 29 and heating units (not shown) and is then wound up on roll 30. The spreading method preserves the crimp of the warp elements of the fabric.

In applying the face layer 14 to the other layers, the face material is laid straight, that is with its warp threads extending lengthwise of the band and its filler threads crosswise thereof.

In making an endless band, the ends of fabric of the face layer are cut on the bias and the biased ends butt spliced, the warp elements extending circumferentially of the band. For this purpose, a collapsible drum having the circumference of the desired band is provided. The base layer is laid about the drum and butt-spliced to form an endless band. The cord layer is applied over the base layer and may be made with-

out a splice by applying the coated oppositely twisted cords alternately arranged side by side in a plurality of adjacent convolutions extending from one margin of the band to the other. It has been found that satisfactory results are attained by winding four cords at a time, two of right and two of left hand twist. As the cords are of very small diameter, their inclination along the band is so slight as not to cause the band to run to the side in use.

After application of the cord layer to the drum, the face layer is applied thereto and diagonally butt-spliced.

For vulcanizing the band upon the collapsible drum, a wrapping of cloth under tension is applied over the band, and the drum with the band thereon is placed in an open steam vulcanizer. Use of a collapsible drum is desirable as the rayon cord shrinks during vulcanization and it would be difficult to remove the vulcanized band from a non-collapsible drum. Where narrow bands are desired a wide drum may be employed and the band formed thereon may be separated by cutting it circumferentially to provide a plurality of bands.

While Fig. 2 has been drawn to a magnified scale, the actual band is about one-sixteenth of an inch thick and is very flexible, being adapted to run at high speeds about small pulleys.

When neoprene or other oil-resistant rubber-like material is used in the construction of the band, the band is highly resistant to oil and grease and may be employed when oil and grease are present upon the work to be polished or are employed to cool the work during polishing. As the belt has a raw fabric surface, it is adapted to being "set up" with adhesives and abrasive grains which may be renewed throughout the life of the band which is exceptionally long.

Variations may be made without departing from the scope of the invention as it is defined by the following claims.

I claim:

1. A high speed band for supporting polishing material, said band comprising a layer of tension-resisting elements extending lengthwise of the band in substantially parallel relation, a backing layer of extensible plastic material on one face of the tension resisting elements, and a face layer of textile material at the opposite face thereof, said face layer having an exposed face substantially free from coating material for mounting an abrasive material thereon and being extensible in the lengthwise direction of said tension-resisting elements and attached thereto by an intervening layer of resilient rubber material for relieving said face layer of substantially the entire tension load on the band and imposing substantially all such load on said tension-resisting elements.

2. A high speed band for supporting polishing

material, said band comprising a single layer of tension resisting cords extending longitudinally of the band, a backing layer of extensible rubber-like material on one face of the cord layer, and a face layer of woven straight laid fabric at the opposite face of the cord layer, said face layer having an exposed face substantially free from rubber coating material for mounting an abrasive material thereon and being extensible in the lengthwise direction of said tension-resisting cords and attached thereto by an intervening layer of resilient rubber material for relieving said face layer of substantially the entire tension load on the band and imposing substantially all such load on said tension-resisting cords.

3. A high speed band for supporting polishing material, said band comprising a single layer of rayon tension resisting cords extending longitudinally of the band, a backing layer of rubber-like material on one face of the cord layer, and a layer of woven straight laid fabric at the opposite face of the cord layer, said face layer having an exposed face substantially free from coating material for mounting an abrasive material thereon and being extensible in the lengthwise direction of said tension-resisting cords and attached thereto by an intervening layer of resilient rubber material for relieving said face layer of substantially the entire tension load on the band and imposing substantially all such load on said tension-resisting cords.

4. A high speed band for supporting polishing material, said band comprising a single layer of tension resisting cords extending longitudinally of the band, alternate cords of said layer being of opposite twist, a backing layer of rubber-like material on one face of the cord layer, and a face layer of woven straight-laid fabric at the opposite face of the cord layer, said face layer having an exposed face substantially free from coating material for mounting an abrasive material thereover and being extensible in the lengthwise direction of said tension-resisting cords and attached thereto by an intervening layer of resilient rubber material for relieving said face layer of substantially the entire tension load on the band and imposing substantially all such load on said tension-resisting cords.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
63,341	Traut	Mar. 26, 1867
1,470,924	Jury	Oct. 16, 1923
2,320,139	Kirchner	May 25, 1943
2,402,356	Bacon et al.	June 18, 1946
2,461,654	Nassimbene	Feb. 15, 1949