C. T. L. VON RABENAU.

MOTOR CYCLE DRIVING BELT.

APPLICATION FILED JULY 17, 1911.

1,028,783. Patented June 4, 1912.

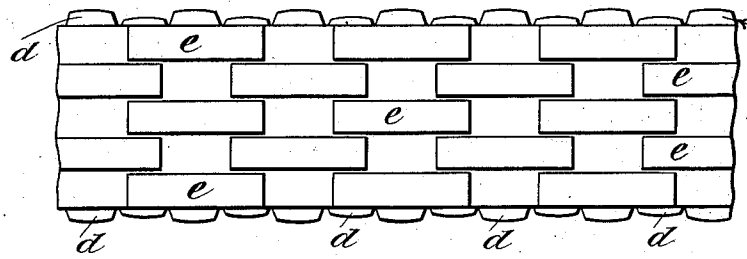


FIG. 1.

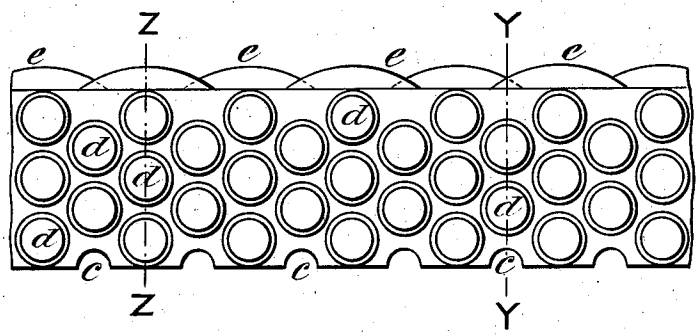


FIG. 2.

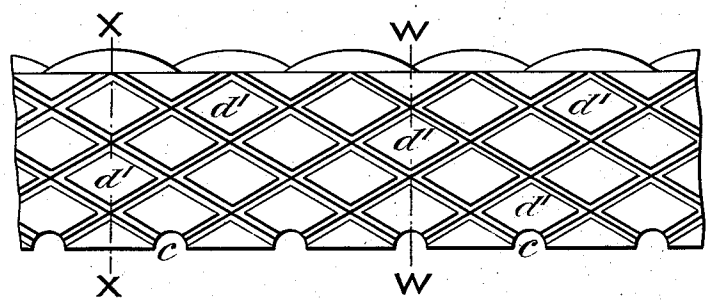


FIG. 3.

FIG. 4. FIG. 5. FIG. 6. FIG. 7.

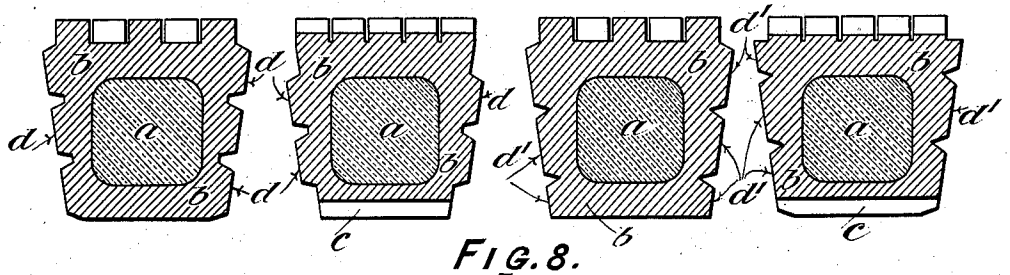
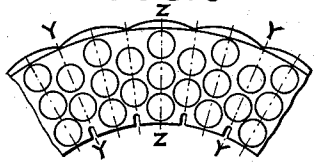


FIG. 8.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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MOTOR-CYCLE DRIVING-BELT.

1,028,783. Specification of Letters Patent. Patented June 4, 1912.

Application filed July 17, 1911. Serial No. 638,978.

To all whom it may concern:

Be it known that I, CURT THÉODOR LEONARD VON RABENAU, a subject of the German Emperor, residing at 207A Pentonville road, Islington, in the county of London, England, have invented certain new and useful Improvements in Motor-Cycle Driving-Belts, for which I have obtained a patent in Great Britain, No. 17433, bearing date July 22, 1910, of which the following is a specification.

My invention relates to the thick and narrow wedge shaped driving belts used on motor cycles or machines using grooved pulleys, which belts are intended to drive entirely or mainly by frictional contact between the sides of the belt and the inclined side faces of the pulleys.

The objects in view are therefore to provide for good frictional contact by means of suitably shaped projections or studs on each side face of the belt, the forms of the studs being governed by boundary channels sunk below the surface of the studs, thus allowing air and rain water to escape, while the belt contact is more elastic and consequently adhesive than if the side faces were continuous. By suitably arranging these studs in combination with other features, described hereinafter, the further objects of obtaining greater flexibility in the belt, as well as greater resiliency are obtained, and thus an economy in the motor power or greater speed of the machine is produced.

Reference is made, in further description of the invention, to the accompanying drawings, in which—

Figure 1 is a plan of the upper surface of a piece of the belt; Fig. 2 is a side elevation of Fig. 1, showing a pattern of round studs on the side face of the belt; Fig. 3 is a similar side elevation, but showing a pattern of diamond shaped studs instead of the round ones; Fig. 4 is a cross section through the belt on the line Z—Z of Fig. 2; and Fig. 5 is a similar cross section of Fig. 2 on the line Y—Y. Fig. 6 is a cross section of Fig. 3 on the line X—X, and Fig. 7 a cross section on the line W—W of Fig. 3. Fig. 8, a diagram on a smaller scale, shows the tensile strain on the upper surface of the belt, and compression on the lower, in passing around a pulley.

The driving belt is made on a core, *a*, of canvas impregnated or coated with a solution of india rubber, gutta percha, or similar substances or compounds thereof, and then covered all around with a fairly thick coating of india rubber, *b*, molded in a metal mold, and vulcanized, all in the usual manner. But in my invention a pattern is molded on all four sides of the belt, three of which are specially formed, arranged, and combined with the fourth pattern of a small semi-circular groove *c*, molded across the bottom of the belt at regular intervals of a little less than half an inch apart for an average size belt. The said grooves have been used hitherto to give greater flexibility to the belt, which is naturally stiff from its thickness and construction, but the grooves alone are not satisfactory.

On each side face of the belt I form round studs *d*, as indicated in Fig. 2, or diamond shaped studs d^1, as indicated in Fig. 3 and arrange them so that two studs (for example) are situated above each semi-circular groove *c*, and three studs above the intervening bottom surface of the belt; boundary channels, as aforesaid being sunk between the several studs *d* or d^1, for the escape of air or rain water that would otherwise be trapped against the faces of the pulleys and lessen adhesion. These channels communicate with the grooves *c*.

On the upper surface of the belt, the pattern is similar to interwoven basket-work, the ribs projecting above the general upper surface line of the belt, but formed as flat topped segments *e* in five lines (for example), the ends of each segment being separated by the space of about half its own length from the preceding and following segments on the same line of segments. Each line of segments is similarly arranged, but breaking joint, as it were, with its neighboring line or lines, the ends of each segment *e* passing or overlapping the similar position of the ends of the adjoining line or lines of segments. It will be seen that the arrangement of segments *e*, and studs *d* or d^1, is such that a transverse line across the highest or central part of each of three segments *e*, coincides with the center of three studs *d* or d^1 on each of the side faces of the belt, and also with the center of the intervening bottom surface of the belt, as indicated by the lines Z—Z, Fig. 2, and X—X of Fig. 3, and that on this line there is the greatest depth or mass of material, (as shown in Figs. 4 and 6); and at all such points the belt would present the greatest

rigidity to bending. But next to this line of greatest rigidity is the line of greatest flexibility, being Y—Y in Fig. 2, and W—W in Fig. 3, owing to the transverse line passing through the thin parts of but two lines of segments, through two studs on each side face, and through the center of the groove *c*, the section at these points (Figs. 5 and 7) showing the least amount of material, and therefore giving the greatest amount of flexibility.

It will be seen that the lines of greatest rigidity, and greatest flexibility closely adjoin each other, and are alternately arranged, so that while the belt is practically stretched evenly when on the straight part of its path, yet when bending around the pulleys used the lines would assume radial instead of parallel positions, as shown in the diagram Fig. 8. Therefore, while the belt bends easily through the lines of greatest flexibility, the segments *e* between these lines being stretched to the greatest extent in passing around a pulley will immediately contract to their normal form on passing into the straight portion of their path, thus exerting the maximum of resiliency, combined with flexibility.

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

1. A driving belt for transmitting power by the frictional grip of its inclined sides upon the side faces of a grooved pulley, having in combination grooves cut across its under surface, a pattern of segment like basket-work raised above the general upper surface of the belt, and a pattern of studs with intervening sunken channels on each side face of the belt, substantially as and for the purpose described.

2. A driving belt for transmitting power by the frictional grip of its inclined sides upon the side faces of a grooved pulley, having in combination grooves cut across its under surface, and a pattern of projections above the general upper surface of the belt, the said projections being so arranged as to present alternate maximum and minimum masses of material in cross section, substantially as and for the purpose described.

3. A driving belt for transmitting power by the frictional grip of its inclined sides upon the side faces of a grooved pulley, having in combination grooves cut across its under surface, and a pattern of studs with intervening sunk channels on each side face of the belt, the said channels communicating with the said grooves, substantially as and for the purpose described.

4. A driving belt for transmitting power by the frictional grip of its inclined sides upon the side faces of a grooved pulley, having in combination a central core of canvas coated or impregnated with an adhesive, an exterior coating of india rubber, said belt having sunk spaces formed in the rubber on each of its four sides so spaced and arranged as to present alternate spaces of greatest and least material at regular distances apart, substantially as and for the purpose described.

5. A motor cycle driving belt comprising a central core of canvas and an external coating of india rubber, said coating having patterns molded on each of its four sides by alternate sinkings and projections of the said rubber, arranged and operating to produce regular alternating transverse lines of greatest and least flexibility, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CURT THEODOR LEONARD VON RABENAU.

Witnesses:
JOSEPH SINCLAIR FAIRFAX,
H. R. FORSTER.