Jan. 10, 1928. 1,655,827

F. C. STANLEY

FRICTION MEMBER AND INSERT

Filed Aug. 7, 1925 2 Sheets-Sheet 1

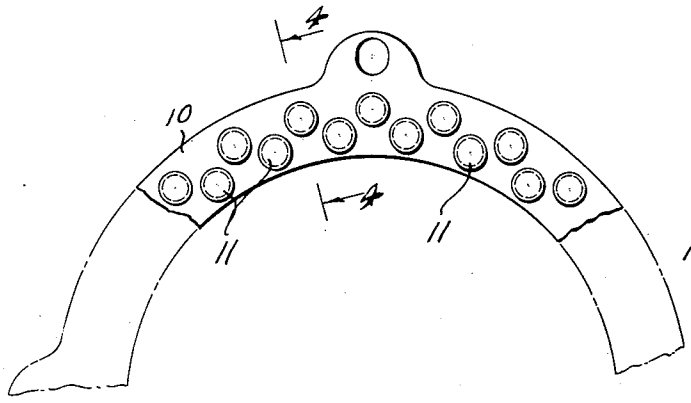


Fig. 1.

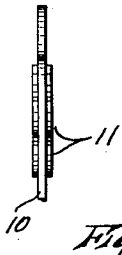


Fig. 2.

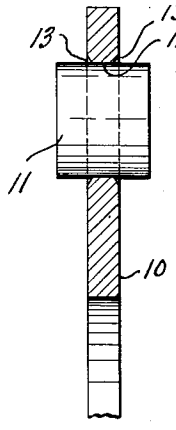


Fig. 3.

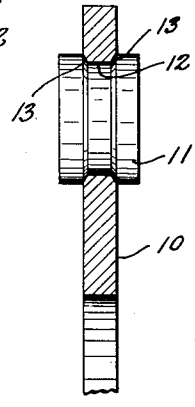


Fig. 4.

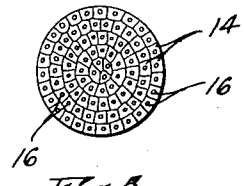


Fig. 5.

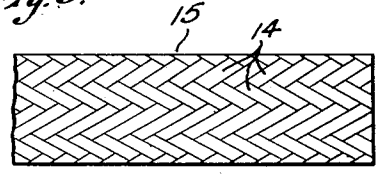


Fig. 6.



Fig. 7.

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2 Sheets-Sheet 2

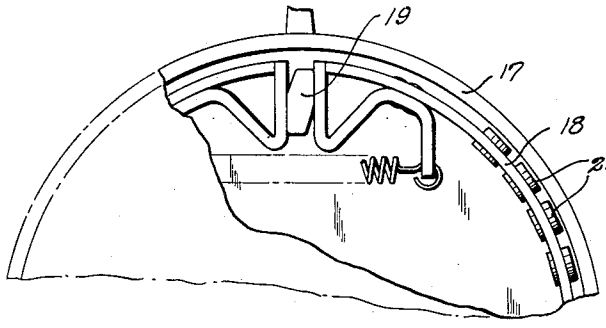


Fig. 8.

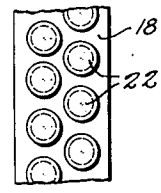


Fig. 9.

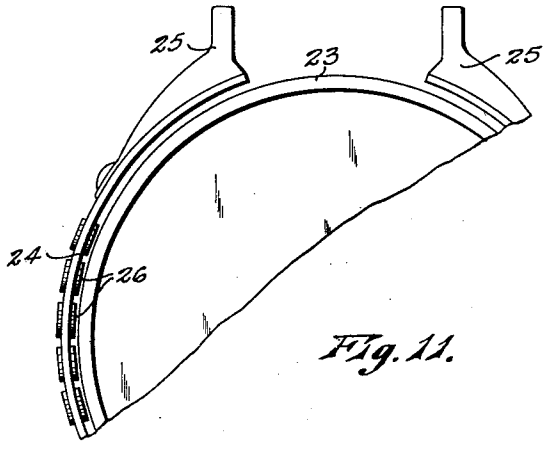


Fig. 11.

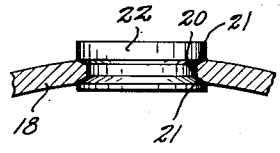


Fig. 10.

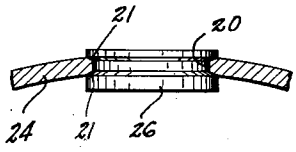


Fig. 12.

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UNITED STATES PATENT OFFICE.

FREDERICK C. STANLEY, OF FAIRFIELD, CONNECTICUT, ASSIGNOR TO THE RAYBESTOS COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

FRICTION MEMBER AND INSERT.

Application filed August 7, 1925. Serial No. 48,765.

This invention relates to a friction member for a clutch, a disc brake, internal brakes, external brakes and the like, and to inserts therefor, and has for an object to provide a new and improved construction of friction member and inserts in which the abrading effect of operation is reduced, so that the inserts will wear longer, and also to provide a construction of insert which may be run dry so that it is not necessary to immerse it in oil.

The friction member comprises a metal supporting member provided with a plurality of transverse openings in which the inserts are mounted, and these inserts comprise a plug of suitable length cut from a bar or strip formed of braided fibrous yarn, preferably asbestos yarn, and the yarn may or may not be reenforced with a metal wire. The braided yarn is hardened with a suitable binder. The inserts are mounted so that the ends of the strands of yarn, and therefore, the ends of the fibres are on the bearing surfaces of the inserts.

Referring to the accompanying drawing,

Fig. 1 is a side elevation of a portion of a friction clutch disc or friction member for a disc brake, showing the inserts mounted in position.

Fig. 2 is an edge elevation thereof.

Fig. 3 is a transverse section on an enlarged scale through the disc showing an insert placed in position but before being compressed for setting purposes.

Fig. 4 is a transverse section similar to Fig. 3 showing the inserts set in position, the section being substantially on line 4—4 of Fig. 1.

Fig. 5 is an end elevation of one of the inserts.

Fig. 6 is a side elevation of a portion of the rod or bar of braided yarn from which the inserts are cut.

Fig. 7 is a partial side elevation and partial section of a reenforced strand of yarn.

Fig. 8 is a side elevation of a portion of a brake having an internal expanding member showing my improved insert applied thereto.

Fig. 9 is an elevation of a portion of the face of said expanding member.

Fig. 10 is a cross section through the same on an enlarged scale showing the insert in elevation.

Fig. 11 is a side elevation of a portion of a brake having an external band or friction member showing my improved insert applied thereto, and

Fig. 12 is a cross section through the external band of Fig. 11, drawn to an enlarged scale and showing the insert in elevation.

Referring to Figs. 1 to 4, numeral 10 indicates a portion of any suitable form of a flat metal disc such as are used in multiple disc friction clutches or in disc brakes, this disc in the present form being an annular disc and carries inserts 11. The rest of the clutch or brake construction is not shown, it being understood that these discs with the inserts are used in alternate relation with plain metal members with relative rotating movement between the members in a manner well known.

The disc 10 is provided with a relatively large number of transverse openings 12 suitably placed, and these openings are preferably countersunk at their opposite ends, as shown at 13. My improved inserts 11 are formed by braiding together a suitable number of strands 14 of fibrous yarn, preferably asbestos yarn, to form a bar 15 of any desired length. These strands of yarn are tightly braided together and then the bar is hardened with a suitable saturant binder to cause the fibres to adhere and give a substantially solid homogeneous mass. The saturant binder may be any of the usual binders used for fibrous friction clutch facings, for example a drying oil such as linseed oil, Chinawood oil or synthetic resin. This binder causes the fibres of the yarn to adhere and prevents to a large extent the powdering of the asbestos fibres in the clutch or brake, or in other words it decreases the tendency to abrasion of the fibres in use. The braiding of the yarn to form the bar from which the inserts are cut causes the fibres to lie to a large extent in a direction lengthwise of the bar, and therefore, when the inserts are cut from this bar the ends of the fibres lie in the opposite ends of the inserts, so that the ends of the fibres form the bearing surfaces of the inserts and the wear is in a direction transversely of the fibres. This greatly reduces the tendency to abrasion of the fibres in use and gives a much longer wearing ability.

In forming the inserts the bar 15 is merely cut transversely to suitable lengths by a saw, and it will thus be apparent there is no

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waste of material excepting the sawdust produced by this cutting operation. The inserts are placed in the openings 12 in the disc or supporting member, being cut to a length so as to project laterally the desired distance from the faces of the member, and then are subjected to a longitudinal pressure on their opposite ends which upsets them slightly into the countersinks 13, as shown in Fig. 4, and thus they are securely held in the supporting member.

In Figs. 8 to 10 I have shown my improved friction member and insert as applied to an internal brake. In these figures I have merely shown conventionally the rotating drum 17 having the usual flange which is engaged by the internal expanding friction member. This friction member comprises the support 18 within the drum which is split at one side for insertion of an expanding means such as the cam 19 operated from a brake lever by any suitable means, not shown. This support 18 is provided with transverse openings 20 having countersinks 21 at their opposite ends the same as in the support 10 of Figs. 1 to 4. The inserts 22 are also placed in position in the same manner as in the support 10 except that as the inserts bear only at their outer ends against the rotating member it is not necessary that they project as far from the inner surface of the support 18.

In Figs. 11 and 12, I have shown my improved friction member as applied to an external brake. Here the member 23 is the rotating drum surrounding by the flexible band or support 24 for the inserts 26. This band or support is clamped about the band to secure the braking effect by any suitable means, not shown, acting through the ears 25. The inserts 26 are mounted in the band to produce the friction member in the same manner as is used in the forms shown in Figs. 1 to 10, except that as to wearing effect is all on the ends of the inserts on the inner surface of the band it is not necessary that they project as far from the outer face of the band.

It has been found in operation that there is very little compression of these inserts in use so that they do away with the frequent adjustments of the clutch or brakes required with some forms of friction members. Furthermore, they may be used dry, and it is, therefore, not necessary to maintain the clutch disc immersed in a bath of oil as in some clutches. In some forms of clutches it is necessary to immerse the discs in a bath of oil and they must be continually watched to see that the bath of oil does not escape, in which event the clutch would soon be ruined. I also prefer to reenforce the yarn by means of a metal wire such as a brass wire 16, altho this reenforcement may or may not be used as is found desirable. A convenient means of reenforcing this yarn is to place the asbestos fibre about the wire, as indicated in Fig. 7, and then braid the reenforced yarn to form the bar 15. This also locates the free ends of the wire at the opposite ends or the bearing surfaces of the inserts and tends to further decrease the abrasion.

Having thus set forth the nature of my invention, what I claim is:

1. An insert for a friction member comprising braided asbestos yarn the fibres of which are held together by a suitable binder.

2. An insert for a friction member comprising braided fibrous yarn saturated with a hardening binder.

3. An insert for a friction member comprising braided asbestos yarn saturated with a hardening binder.

4. An insert for friction members comprising braided yarn saturated with a suitable binder, the yarn being composed of fibre reenforced by a wire.

5. An insert for friction members consisting of braided fibrous yarn the fibres of which are caused to adhere by means of a hardening solution of a primarily viscous and subsequently hardening character.

6. An insert for friction members consisting of braided asbestos yarn, the fibres of which are caused to adhere by means of a hardening solution of a primarily viscous and subsequently hardening character.

7. An insert for friction members comprising a substantially cylindrical plug consisting of braided asbestos yarn with the ends of the strands at the ends of the plug, and the fibres of which are caused to adhere by means of a hardening binder.

8. An insert for friction members comprising a substantially cylindrical plug consisting of braided yarn with the ends of the strands at the ends of the plug and the fibres of which are caused to adhere by means of a hardening solution of a primarily viscous and subsequently hardening character.

9. An insert for friction members comprising a substantially cylindrical plug consisting of braided asbestos yarn with the ends of the strands at the ends of the plug, the yarn being composed of asbestos fibre reenforced by a wire, and the fibres being caused to adhere by means of a hardening binder.

10. An insert for a friction member comprising yarn arranged longitudinally of the insert and saturated with a suitable binder, the yarn being composed of fibre reenforced by a wire.

11. An insert for a friction member comprising a plug consisting of asbestos yarn arranged to extend longitudinally of the plug with the ends of the strands at the ends of the plug, the yarn being composed of asbestos fibre reenforced by a wire, and

the fibres being caused to adhere by means of a hardening binder.

12. In combination, a supporting member provided with a plurality of transverse openings, and inserts in said openings comprising braided fibrous yarn with the ends of the strands at the ends of the inserts, and the fibres of which are caused to adhere by means of a hardening binder.

13. In combination, a supporting member provided with a plurality of transverse openings, and inserts in said openings comprising braided asbestos yarn with the ends of the strands at the ends of the inserts, and the fibres of which are caused to adhere by means of a hardening binder.

14. In combination, a supporting member provided with a plurality of transverse openings, and inserts in said openings comprising braided asbestos yarn with the ends of the strands at the ends of the inserts, the yarn being composed of asbestos fibre reenforced by a wire, and the fibres being caused to adhere by means of a hardening binder.

15. In combination, a supporting member provided with a plurality of transverse openings, and inserts in said openings comprising asbestos yarn arranged with ends of the strands at the bearing ends of the inserts, the yarn being composed of asbestos fibre reenforced by a wire, and the fibres being caused to adhere by means of a hardening binder.

In testimony whereof I affix my signature.

FREDERICK C. STANLEY.

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