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2,778,066

TOP ROLL FOR DRAFTING FRAMES

Filed July 28, 1952

2 Sheets-Sheet 1

Fig. 1.

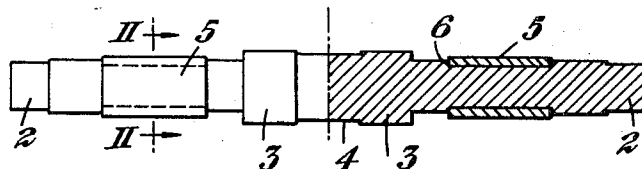


Fig. 2.

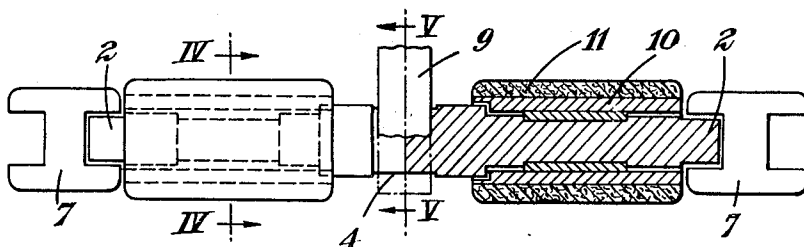


Fig. 3.

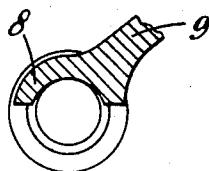


Fig. 5.

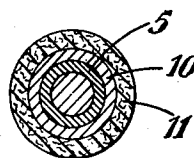


Fig. 4.

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Fig. 6.

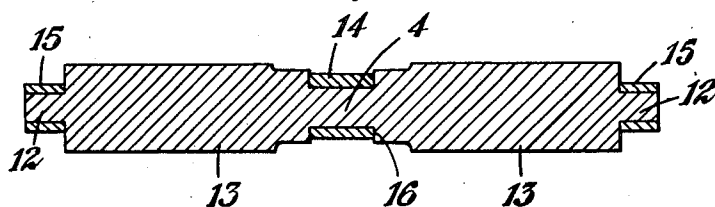


Fig. 7.



Fig. 8.

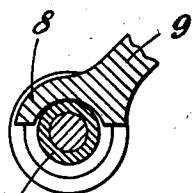
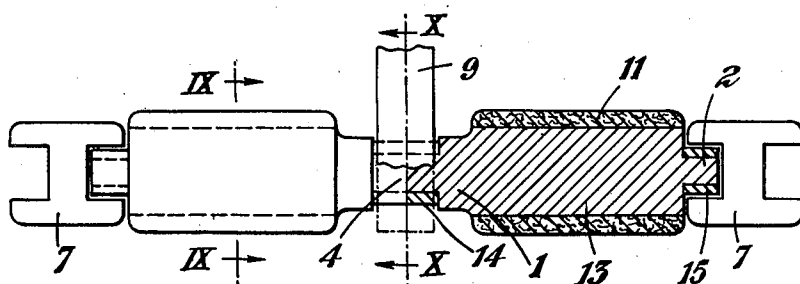


Fig. 10.

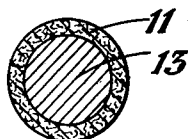


Fig. 9.

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2,778,066

TOP ROLL FOR DRAFTING FRAMES

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Application July 28, 1952; Serial No. 301,308

Claims priority, application Great Britain July 31, 1951

7 Claims (Cl. 19-142)

The invention comprises a shaft which is especially useful in textile machinery, although its use is not confined thereto.

The term "shaft," as used in this specification, includes arbors, spindles, axles and like parts which are rotatable, absolutely or relatively, in other parts.

The difficulty of confining oil to the parts being lubricated has long been a serious problem in textile machinery. In textile drafting systems, for instance, there are rows of rollers, the top rollers (known as "loose boss top rollers") of the row or rows which rotate fastest being adapted to rotate freely on their arbor and those of the other rows (known as "fixed boss top rollers") being keyed or fixed to, or integral with, their arbors. In the conventional machinery it is necessary to oil the arbors where they carry the loose boss top rollers, and in the case of the fixed boss top rollers it is necessary to oil those parts of the arbors in contact with the saddles and with the cap bar nebs. There is, therefore, considerable risk, particularly during the oiling operation, that oil will get into contact with the outer surface of the bosses and that damage to the textile fibres will thereby result. The existence of free oil, moreover, leads to the formation of oily fluff and its adherence to the drafting system. Moreover, oiling needs to be performed at frequent intervals, usually more than once a day, and is therefore expensive both in material and in labour.

To overcome these disadvantages, it has been proposed to line the inside of the loose boss top rollers with sintered metal bushes and to provide the saddle and the cap bar nebs with sintered metal bearing inserts.

A general object of the present invention is a simple and convenient method of producing a shaft formed with a sintered metal bearing part or parts. A more specific object is to provide cheaper and more convenient means of converting conventional textile machinery into machinery incorporating sintered metal bearings and of effecting replacements.

According to the invention, a shaft is cast or moulded in situ within a sintered metal bush or bushes. If a metal shaft is required it is preferably die-cast, whilst a plastic shaft may be moulded in situ within the bush or bushes. The metal shaft may be a zinc or aluminum alloy.

It is to be understood that the term "bush" includes end and thrust bearings.

The sintered metal may be of bronze or ferrous material, and may be porous to be capable of impregnation with oil, or it may contain graphite so as to be self-lubricating.

The shaft may be shaped so that it has flange portions contacting the edges of the bush or bushes. In other words, in the finished article, the bush or each bush is accommodated flush within a recessed portion of the shaft. It will be understood that it will not normally be necessary to provide means whereby a bush will be positively interlocked with the shaft because especially when the sintered metal is porous, the material of the

shaft will be forced, during the casting or moulding, to grip firmly on to the inner surface of the bush.

When the invention is used for arbors for carrying loose boss drafting rollers the length of the bushes may be co-extensive with or shorter than the length of the rollers, the central portion of the arbor being formed in the usual way with a recess, between flanges, to receive the saddle. The dimensions of the arbors are preferably such that the loose boss top rollers of the existing conventional type are snugly received on the sintered metal bushes.

With loose boss top rollers the invention is therefore especially useful since it assists in the conversion of conventional machinery to machinery incorporating sintered metal bushes. The existing loose boss top rollers can be retained and the old arbors replaced by new ones, according to the invention, having the same dimensions as the old. It will be appreciated that this is a cheaper operation than boring the loose boss top rollers in order to receive a sintered metal bush which is pressed in with an interference fit. Moreover, the conversion from the conventional machinery can be very speedily carried out.

It will further be appreciated that if the sintered metal bushes are of the type impregnated with a lubricant such as oil, the oiling operation can be carried out by removing the arbor as such from the machine and allowing it to soak in a bath of oil until sufficient oil has been absorbed, whereafter all free oil is wiped off before replacing the arbor in the machine. By this means, the risk of free oil is substantially completely eliminated.

Sintered metal bushes may be provided both at that part of the arbor which rotates beneath the saddle, and at the ends of the arbor, where the arbor rotates within the respective cap bar neb. An arbor so constructed may be used in connection with fixed boss top rollers.

The invention is illustrated by way of example in the accompanying drawings in which:

Figure 1 is a view, partly in longitudinal section, of a shaft according to the invention,

Figure 2 is a section taken on the line II—II of Figure 1,

Figure 3 is a plan view, partly in section, of part of a textile drafting system provided with a shaft as shown in Figures 1 and 2,

Figure 4 is a section taken on the line IV—IV of Figure 3,

Figure 5 is a section taken on the line V—V of Figure 3,

Figure 6 is a longitudinal section of another form of shaft embodying the invention,

Figure 7 is an end view of Figure 6,

Figure 8 is a plan view, partly in section, of part of a textile drafting system provided with a shaft as shown in Figures 6 and 7.

Figure 9 is a section taken on the line IX—IX of Figure 8, and

Figure 10 is a section taken on the line X—X of Figure 8.

The shaft shown in Figures 1 and 2 has ends 2 of reduced diameter and a flange 3 on each side of its central portion 4. It is produced by being die-cast within a die of complementary shape within which is positioned a pair of sintered metal bushes 5 which, in the finished shaft are snugly accommodated in annular recesses 6, the bushes 5 being thicker than the depths of the recesses 6 so as to project above the surface of the adjacent parts of the shaft. The shaft having been moulded in situ within the surrounding bushes, is circumferentially cohered to the bushes, thus providing a shaft and bush structure which may be installed and removed as a unit.

Referring to Figures 3-5 the ends 2 of the shaft are rotatably mounted in cap bar nebs 7, the central portion

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4 being borne upon by an inverted U-shaped portion 8 of a saddle 9.

Rotatably mounted on the bushes 5 are loose boss top rollers 10 which are covered in the customary manner with flexible material 11 such as leather.

The shaft shown in Figures 6 and 7 has ends 12 of reduced diameter and a flange 13 on each side of its central portion 4. The shaft is produced by having been die-cast within a die of complementary shape within which were positioned a sintered metal bush 14 and a pair of sintered metal bushes 15. In the finished shaft, the bush 14 is snugly accommodated within an annular recess 16 at the central portion 4, while the bushes 15 are on the ends 12 of the shaft.

Referring to Figures 8-10 the bushes 15 are rotatably mounted in cap bar nebs 7, while the bush 14 is borne upon by an inverted U-shaped portion 8 of a saddle 9. The flanges 13 constitute integral fixed boss top rollers each of which is covered with a cot 11 formed of flexible material such as leather.

I claim:

1. A shaft, said shaft having an annular recess, and a sintered metal bush surrounding said shaft and being accommodated in the recess, said bush projecting above the surface of the adjacent parts of the shaft.

2. In a textile drafting system, a shaft having portions of enlarged diameter, a sintered metal bush on the shaft between two adjacent portions of enlarged diameter, and a loose boss top roller mounted on the bush.

3. In a textile drafting system, a shaft, said shaft having an annular recess, a sintered metal bush accommodated in the recess, and a loose boss top roller mounted on the bush.

4. In a textile drafting system, a shaft, said shaft having an annular recess, a sintered metal bush surrounding said shaft and being accommodated in the recess, said bush projecting above the surface of the adjacent parts

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of the shaft, and a loose boss top roller mounted on the bush, the roller projecting beyond the bush on either side thereof.

5. In a textile drafting system, a shaft formed in situ within and being circumferentially cohered to a sintered metal bush located in an annular recess of the shaft, and a loose boss top roller mounted on the bush.

6. In a textile drafting system, a shaft formed in situ within and being circumferentially cohered to a sintered metal bush, said bush surrounding said shaft and being accommodated in an annular recess of said shaft and projecting above the surface of the adjacent parts of the shaft, and a loose boss top roller mounted on the bush, the roller projecting beyond the bush from either side thereof.

7. A shaft, said shaft having an annular recess, and a sintered metal bush surrounding said shaft and being accommodated in the recess, and projecting above the surface of the adjacent parts of the shaft, the shaft being formed in situ within and being circumferentially cohered to said bush.

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