

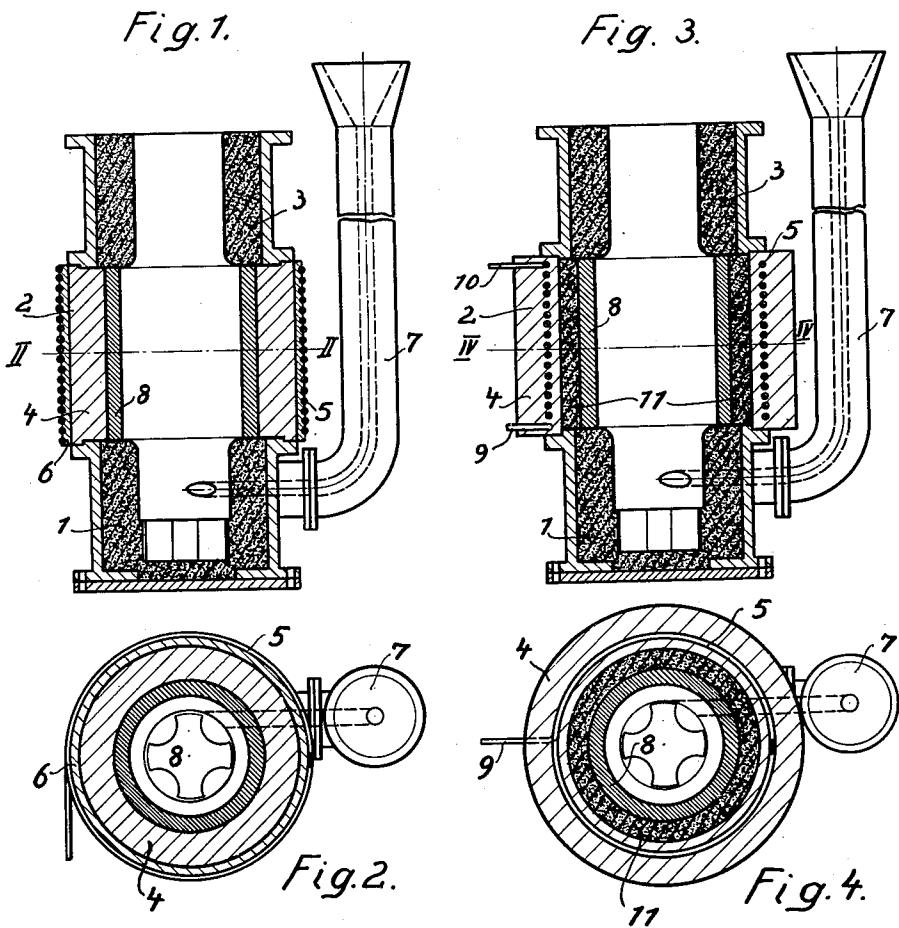
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PROCESS FOR PRODUCING METAL ROLLERS

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PROCESS FOR PRODUCING METAL ROLLERS

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3 Claims. (Cl. 22-204)

The invention relates to a process for producing metal rollers, more particularly iron rollers of the type used for burnishing rolled band iron or the like.

5 In such rollers, the tread must be very hard, while the journals should remain soft. To secure this result, a core and a shell, forming the tread of the roller, may be produced in separate operations; for example, a highly heated iron core may be placed in a mould and iron cast round it.

10 The present invention comprises a process for manufacturing metal rollers, substantially as hereinafter described and claimed in the appended claims.

15 Moulds suitable for use in carrying out the process according to the invention, are illustrated, by way of example, in the accompanying drawing, in which:—

Figure 1 is a sectional elevation, and

20 Figure 2 is a plan view, the main part of the mould being in section, taken along the line II—II of Figure 1.

Figure 3 is a sectional elevation of a modified construction, and

25 Figure 4 is a section on the line IV—IV of Figure 3.

30 The mould is made up of three parts, a lower box 1, a middle box 2 and an upper box 3. The lower box 1 and the upper box 3 are made, in the usual manner, from moulding sand, while the middle box is produced from a refractory material such as chamotte. The middle box consists of a chamotte ring 4, around which an induction coil 5 is disposed. This may bear directly on the ring 4, or, as shown in Figure 1, it may be arranged on an insulating layer 6, which is provided around the ring 4 and formed of asbestos cement or like heat resisting material. An inlet tube 7 enters the lower box 1 in a tangential direction, so that fluid metal passing through it, is given a circulatory movement for the purpose set out below.

40 A previously made shell 8, which forms the tread of the roller, is placed in the middle box 2. This shell is extremely hard and preferably is made of iron which has a high carbon content and has been melted in a cupola furnace. For example, the iron is placed in an electric hearth, or crucible furnace, where it is decarbonized. The iron is raised to a high temperature and then ferro-chromium-nickel is added. Preferably the shell, when finished, should contain not more than 2.5 per cent of carbon, 10 to 18 per cent of nickel, 1 to 15 per cent of chromium and 1 to 2 per cent of silicon. The shell 8, which has been thus produced and placed in the middle box 2, is heated by electrical induction currents; the heating is first conducted within limits that enable the mould to be well dried. The inductive action is then increased until the shell is at sweating

65 casting steel or the like, is poured into the mould through the tube 7, and as the tube enters the lower mould tangentially, a circulatory movement is imparted to the fluid iron as it rises in the mould, so that air bubbles are prevented from lodging between the wall of the shell and the fluid core, which may otherwise easily occur when a previously made shell is present in the mould. After the casting is complete, the current, which was previously switched off, is switched on again, so that the roller is again heated by means of the induction coil 5. This supplementary thermal treatment is continued until all the bubbles have risen out of the fluid core and dross has formed on the top. Furthermore, the welding of the 75 shell to the core is assisted.

Figure 3 illustrates a modification in which the induction coil 5 is embedded in the ring 4, which forms the middle part 2 and may be made, for example, of an asbestos cement composition. 80 The ends 9 and 10 of the coil 5 are exposed. The induction coil 5, in this construction, is placed as close to the work as the heat will allow, whereby the cross-section of the leakage field of the induction lines inside the coil becomes as small as possible and so that a considerable increase 85 both in the useful induction current and in efficiency results.

I claim:

1. A process for the manufacture of an iron 90 roller consisting in forming a tread for said roller as a separate shell, placing said shell in a mould, heating said shell by electric induction, forming the body of said roller by pouring liquid metal into said mould, and reheating said 95 roller by electric induction.

2. A process for the manufacture of a metal roller, comprising, forming a tread for said roller as a separate shell, placing said shell in a mould, heating said shell by electric induction and forming the body of said roller by pouring liquid metal into said mould in a direction tangential to the walls of said mould. 100

3. A process for the manufacture of a metal roller consisting in making a mould, embedding 105 a coil of an electric conducting material in the walls of said mould, forming a tread for said roller as a separate shell, placing said shell in said mould, heating said shell by electric induction from said coil, and forming the body of 110 said roller by pouring liquid metal into said mould.

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