

⑫ **EUROPEAN PATENT APPLICATION**

⑰ Application number: **87301124.1**

⑤① Int. Cl.³: **B 02 C 17/22**

⑱ Date of filing: **10.02.87**

③① Priority: **10.02.86 ZA 860955**
19.11.86 ZA 868771

④③ Date of publication of application:
26.08.87 Bulletin 87/35

⑥④ Designated Contracting States:
AT DE ES FR GB IT SE

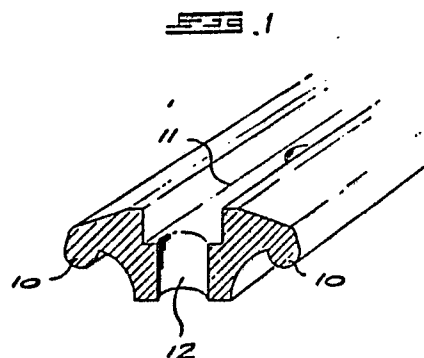
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⑤④ Mill lining.

⑤⑦ A T-shaped rail for fitting a rubber lifting bar to a mill shell has a drooping head to the T with rounded ends. The bar is secured to the shell by means of bolts held captive in slots in the top of the T. In alternative constructions the leg of the T has an undercut slot in which the heads of bolts can be held captive or which can accommodate channel sections in which such heads are held captive.



"MILL LINING"

BACKGROUND TO THE INVENTION

This invention relates to the lining of grinding mills such as ball mills and rod mills.

It is already the practice to use lifter bars made of rubber in ball and
5 rod mills. Conventional lifter bars of the kind in question fit over T-shaped rails fitted to the mill shell. The effect is that at the ends of the head of the T, two right angles are formed in the rubber. This angled construction is not very suitable for use in a rubber product which is under intermittent stress.

10 SUMMARY OF THE INVENTION

According to the invention a T-shaped rail for fitting a rubber lifting bar fitting over the rail to line the shell of a grinding mill is characterised in that the rail has a short wide leg and that the ends of the head of the T droop to rounded terminations.

15 The top of the head of the T may be formed with a slot to accommodate the heads of bolts and the leg be pierced by a series of spaced apart holes for the shanks of the bolts. Alternatively the leg of the T may be formed with an undercut slot.

In one form of the invention the undercut slot is dimensioned to accept
20 and hold against rotation the heads of bolts for securing the rail to a mill shell.

In another form of the invention a series of holed channel sections are positioned in the undercut portion of the slot and bolts are held against rotation and withdrawal in the channels.



DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a length of rail according to the invention,

Figure 2 is a section through a rail and bar assembled together,

5 Figure 3 is a perspective view of another length of rail according to the invention,

Figure 4 is a section through a second rail and bar assembly,

Figure 5 is a perspective view of a length of rail in combination with channel sections and bolts,

10 Figure 6 is a section through a lifter bar secured to a shell, and

Figure 7 is an exploded view of part of Figures 5 and 6.

DESCRIPTION OF EMBODIMENTS

The rail shown in Figure 1 is an extruded squat T-shape with the ends 10 drooping and rounded. A slot 11 is formed in the head of the T and 15 through the base of the slot securing holes 12 have been drilled. The width of the slot 11 is such that the head of the securing bolts used cannot rotate when they are inserted in the holes 12.

Figure 2 shows a rubber bar with a hard layer 19 and a soft layer 18 passed over a rail of figure 1.

20 Figure 3 shows a rail which is intended to be moulded integrally with a bar in the manner shown in Figure 4. It has drooping ends 14 and 15 to the head of the T and in the leg of the T an undercut slot 16 has been extruded. The undercut portion accommodates the heads of securing bolts against rotation. This embodiment is more versatile than the first as 25 there is no need to have holes in register with holes in a mill shell.

Figure 5 shows an extruded aluminium rail according to the invention with an undercut slot 21. Inside the slot 21 there fits extruded channel sections 22 with holes in their webs through which pass bolts with heads 23 and shanks 25 as shown in Figure 7. The heads 23 are held against 30 rotation in the channels of the sections 22.

Figure 6 shows a lifter bar in position over a rail of Figure 5 and held to a shell 27 by means of nuts 28 screwed on to the shanks 25 of the bolts associated with the channel sections 22.

Identical rails of Figure 5 can be used in a variety of applications. As the required bolt sizes change, the inside width of the channels in the sections 12 is changed.

CLAIMS:

1.

A T-shaped rail for fitting a rubber lifting bar fitting over the rail to line the shell of a grinding mill characterised in that the rail has a short wide leg and that the ends (10, 14, 15) of the head of the T droop to rounded terminations.

2.

The rail claimed in claim 1 in which the top of the head of the T is formed with a slot (11) to accommodate the heads of bolts and the leg is pierced by a series of spaced apart holes (12) for the shanks of the bolts.

3.

The rail claimed in claim 1 in which the leg of the T is formed with an undercut slot (16, 21).

15 4.

The rail claimed in claim 3 in which the slot (16, 21) is dimensioned to accept and hold against rotation the heads (23) of bolts for securing the rail to a mill shell (27).

5.

20 The rail claimed in claim 3 in which a series of holed channel sections (22) are positioned in the undercut portion of the slot (21) and bolts are held against rotation and withdrawal in the channels (22).

6.

A mill fitted with rubber lifter bars fitted to rails as claimed in any one of the above claims.

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FIG. 1

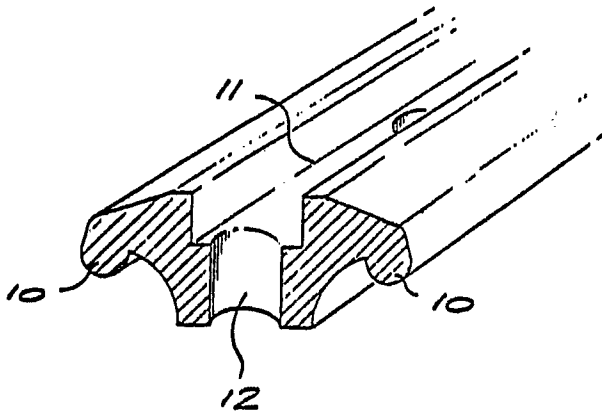


FIG. 3

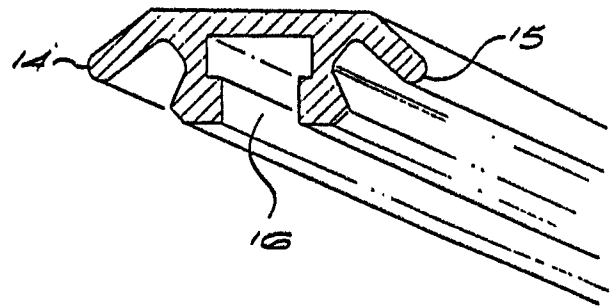


FIG. 2

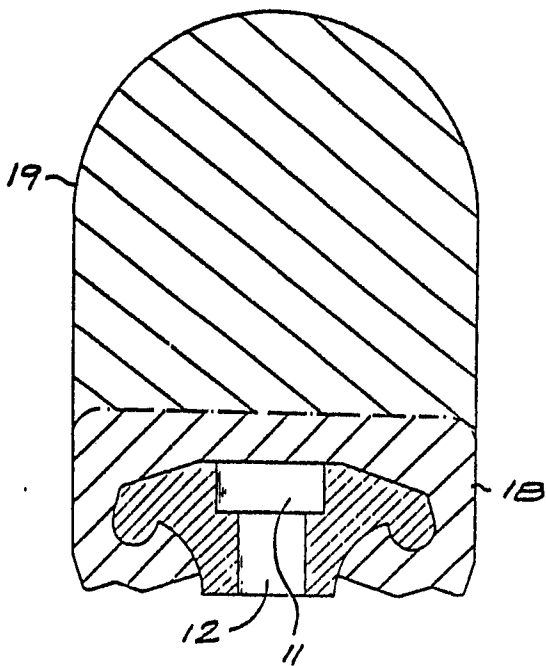


FIG. 4

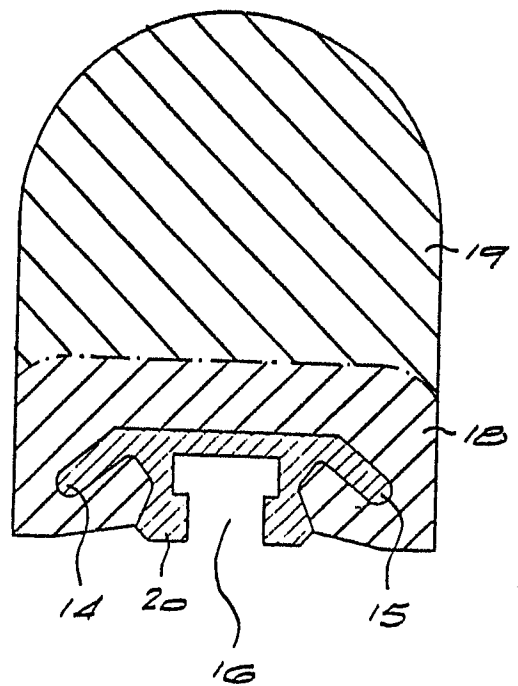


FIG. 5

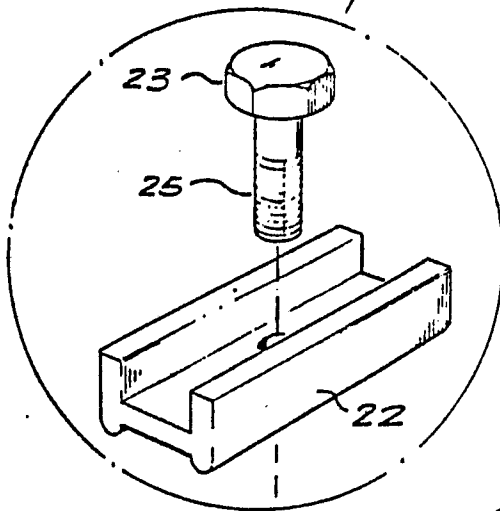
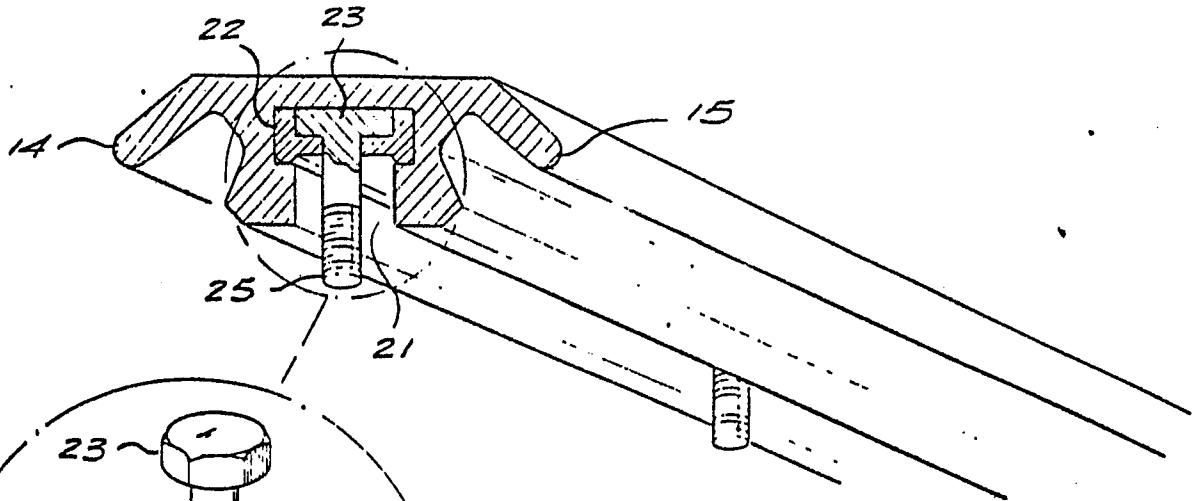


FIG. 7

FIG. 6

