GRIZZLY BAR CONSTRUCTION

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Filed Dec. 2, 1964, Ser. No. 415,304
6 Claims. (Cl. 34—164)

A grizzly is a device having a deck of spaced longitudinally inclined bars for separating relatively large size particles of material from particles of smaller sizes. A grizzly is used for high volume scalping of aggregates, ores, coal etc., ahead of crushers, washers or similar equipment. A grizzly is also used for making size separations of klinker, sinter, agglomerates, etc., discharged at very high temperatures from a rotary kiln or other type of furnace. The present invention relates to a bar construction for such high temperature operations.

According to one practice of the prior art, grizzly bars for high temperature operations are made rectangular in cross section with walls defining an internal passage for cooling air. A cap made of heat and impact resistant alloy steel is fitted over the top of the bar and welded thereto. This cap is subjected to the impact of the hot material falling upon the grizzly deck and the cap is made in relatively short sections, as compared to the longitudinal length of the bars, so that individual cap sections may be replaced when they become worn. In operation, however, the hot material passing between bars and hot atmosphere to which the bars are exposed, produce one or more hot spots along the side of the bar causing the bar to bend. It is to this problem that the present invention is directed and accordingly is a principal object of this invention to provide a new and improved bar construction that will eliminate that problem.

According to the present invention a bar is constructed of a pair of side wall members, a bottom wall and a top wall to define such a rectangular cross section and an internal passage for cooling air. A plurality of cap segments are arranged along the top wall of the bar with a small initial space between them to allow for expansion and with a portion beneath and inward of each longitudinal cap segment so that the space therebetween forming a predetermined distance over the outer surface of each side wall of the bar. The depending portions of the cap segments each define an opening at a location midway between the longitudinally spaced ends of the cap segment. Each initially spaced segment is welded to the bar within the space defined by these openings so that each cap segment can expand in both directions along a longitudinal axis and substantially close the spaces between adjacent segments without causing buckling of the cap segments or the bar itself. A heat reflecting shield having bottom and side portions generally U-shaped in cross section is provided to protect the bar 16 from thermal radiation. The upper edges of the shield overlap the outer surfaces of the depending portions of the cap segments for attachment thereto, in a manner that will be described, and the shield hangs from the depending portions of the cap segments to enclose a U-shaped space around the outer surface of the bottom wall of the bar and the portions of the outer surfaces of the side walls of the bar not covered by the cap segments. The shield is also made in segments, initially spaced from each other and at midlocation the shield 15 is welded to the bottom wall of the bar 16 and the portions of the outer surfaces of the side walls 11, 12 not covered by the cap segments 16. The shield 25 is also made in segments initially spaced from each other such as by the distance 17 to provide for thermal expansion. Each side portion 27, 28 of a shield segment also defines an opening to expose the openings in the depending portions of the cap segments and at this midlocation the shield 25 is welded to the cap 16 so the shield 25 may also expand axially in both directions and close the spaces between adjacent shield segments. Since the shield 25 wraps only the lower portions of the bar 16 beneath the edges 20, 21 of cap segments 16 the shield 25 is not exposed to impact of particles too large to pass between adjacent bars of a complete grizzly assembly (not shown). The shield 25 can therefore be made thinner than the cap 16 and the walls 11, 12 of the bar 16.

In the operation of a grizzly having capped and shielded bars, according to the preceding description, glancing blows of particles small enough to pass between adjacent bars and radiated heat may cause the shield segments 25 to deform, the bar itself does not bend. The bar itself does not bend because it is shielded from the heat that in installations constructed according to the described prior art, did cause the bar itself to bend. Both the shield segments and the cap segments are easily replaced individually as may be required from time to time.

Other objects and how they are attained will appear from the following more detailed description of an embodiment of the invention shown in the drawing in which:

FIG. 1 is a side view of a portion of a grizzly bar capped and shielded according to the present invention, and

FIG. 2 is a view in section along line II—II in FIG. 1 and taken in the direction indicated by arrows. Referring to the drawing, a grizzly bar 10 is constructed of a pair of side wall members 11, 12, a bottom wall 13 and a top wall 14 to define an internal passage 15 for cooling air. A plurality of cap segments 16 are arranged along the top wall 14 of the bar 10 with a small space 17 initially provided between adjacent cap segments 16 to allow for expansion and with portions 18, 19 beneath and inward of longitudinal edges 20, 21 thereof depending downwardly a predetermined distance over the outer surface of each side wall 11, 12 of the bar 10. The depending portions 18, 19 of the cap segments 16 each define an opening 22 at a location midway between the longitudinally spaced ends of the cap segment 16. An initially spaced segment 16 is welded to the bar 10 within the space defined by these openings 22 so that each cap segment 16 can expand in both directions along a longitudinal axis and substantially close the spaces 17 between adjacent segments 16 but without causing buckling of the cap segments 16 or the bar 10. A heat reflecting shield 25 having a bottom 26 and side portions 27, 28 generally U-shaped in cross section is provided to protect the bar 16 from thermal radiation. The upper edges of the shield 25 overlap the outer surfaces of the depending portions 18, 19 of the cap segment 16 for attachment thereto, in a manner that will be described, and the shield 25 hangs from the depending portions 18, 19 of the cap segments 16 to enclose a U-shaped space 29 around the outer surface of the bottom wall 13 and the portions of the outer surfaces of the side walls 11, 12 not covered by the cap segments 16. The shield 25 is also made in segments initially spaced from each other (such as by the distance 17) to provide for thermal expansion. Each side portion 27, 28 of a shield segment 25 also defines an opening 30 located to expose the openings 22 in the depending portions 18, 19 of cap segments 16 and at this midlocation the shield 25 is welded to the cap 16 so the shield 25 may also expand axially in both directions and close the spaces 17 between adjacent shield segments 25 without buckling the shield. Since the shield 25 wraps only the lower portions of the bar 16 beneath the edges 20, 21 of cap segments 16 the shield 25 is not exposed to impact of particles too large to pass between adjacent bars of a complete grizzly assembly (not shown). The shield 25 can therefore be made thinner than the cap 16 and the walls 11, 12 of the bar 16.

From the foregoing it will be understood that the present invention is possessed of unique advantages. However, such modifications and equivalents of the dis-
closed concepts such as readily occur to those skilled in the art are intended to be included within the scope of this invention and thus the scope of this invention is intended to be limited only by the scope of the claims such as are, or may hereafter be, appended hereto.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A grizzly bar assembly comprising a rectangular bar having a top, bottom and side walls, a cap on said top wall, said cap having depending portions outwardly of said side walls with said depending portion being fastened to said side walls, and a heat reflecting shield spaced around the side walls and bottom of said bar and said shield having a bottom portion and side portions generally U-shaped in cross section, the upper edges of said side portions overlapping the outer surfaces of said depending portions, said shield being fastened to the overlapped depending portion of said cap.

2. A grizzly bar assembly comprising a rectangular bar having a top, bottom and pair of side walls, a cap on said top wall, said cap having depending portions inwardly of the outer edges of said cap and outwardly of said side walls with said depending portion being fastened to said side walls, and a heat reflecting shield spaced around the side walls and bottom of said bar and said shield having a bottom portion and side portions generally U-shaped in cross section, the upper edges of said side portions overlapping the outer surfaces of said depending portions, said shield being fastened to the overlapped depending portion of said cap.

3. A grizzly bar assembly comprising a rectangular bar having a top, bottom and pair of side walls, a cap on said top wall, said cap having depending portions outwardly of said side walls with said depending portion defining a central opening where said depending portion is fastened to said side walls, and a heat reflecting shield spaced around the side walls and bottom of said bar and said shield having a bottom portion and side portions generally U-shaped in cross section, the upper edges of said side portions overlapping the outer surfaces of said depending portions, said shield being fastened to the overlapped depending portion of said central opening exposing said central openings in said depending portions, said shield being fastened to the overlapped depending portion at said openings in said overlapping portions.

4. A grizzly bar assembly comprising a rectangular bar and an air passage therethrough, a cap on said top wall, said cap having depending portions outwardly of said side walls with said depending portion being fastened to said side walls, and a heat reflecting shield thinner than said bar walls, said shield being spaced around the side walls and bottom of said bar and said shield having a bottom portion and side portions generally U-shaped in cross section, the upper edges of said side portions overlapping the outer surfaces of said depending portions, said shield being fastened to the overlapped depending portion of said cap.

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