Jan. 4, 1966 H. M. HOUSER, JR 3,226,765

EDGE TRIMMING DEVICE

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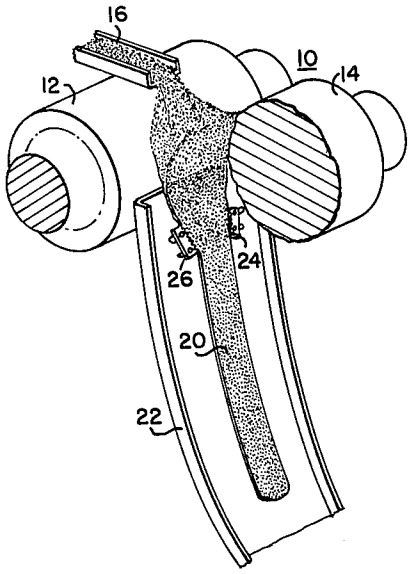


FIG.1

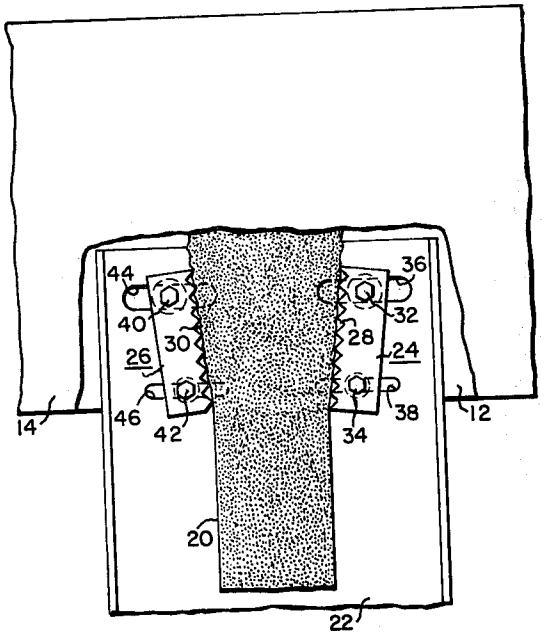


FIG.2

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EDGE TRIMMING DEVICE

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6 Claims. (Cl. 18—9)

This invention relates to rolling of metal powders to form strip, and more particularly to trimming the edge of powder rolled metal strip.

In conventional metal powder rolling to form strip, the metal powder is fed between a pair of rotating rolls. The rolls compact the powder and it exits therefrom as a continuous strip of material. In this form the strip is known as "green" or "unsintered" strip and although it exhibits a certain amount of rigidity or strength, it is quite susceptible to crumbling. Following the compacting step, the strip is sintered and re-rolled for densification in which form it is quite similar to strip formed from ingots by conventional rolling.

The edges of the "green" strip as it exits from the rolling mill are quite ragged and non-uniform and hence at some point the edges must be trimmed and evened. Since the "green" strip can be crumbled rather easily, it is desirable that the edges be trimmed and squared before the sintering and densification steps, since the metal may be more easily removed from the "green" strip.

It is therefore a principal object of this invention to provide an improved edge trimming device for strip compacted from metal powders.

Another object of this invention is the provision of an edge trimming device for use in conjunction with the powder rolling mill for the trimming and squaring of the edges of powder rolled metal strip.

A further more specific object of this invention is the provision of adjustable members for trimming and squaring the edges of strip roll compacted from metal powders.

These and other objects, together with a fuller understanding of the invention may be obtained by reference to the following description and drawing in which:

FIGURE 1 is a perspective view partially in section with parts broken away for clarity of a powder rolling mill incorporating the edge trimming device of this invention, and

FIG. 2 is a front elevational view of the delivery chute of a roll compacting mill incorporating the edge trimming device of this invention.

Referring now to the drawing, a roll compacting mill is shown and designated generally as 10. The compacting mill 10 includes a pair of rolls 12 and 14 journalled for rotation. A vibrating metal powder feeding tray 16 is disposed above the rolls 12 and 14, and is adapted to feed metal powder particles between the rolls wherein the particles will be compacted and will exit from the rolls as a "green" strip 20.

Disposed beneath the rolls 12 and 14, on the exit side thereof, is a strip receiving chute 22 which is adapted to engage and support the "green" strip 20 as it exits from between the rolls 12 and 14. The edges of the strip 20 as it exits from the rolls will be very uneven, irregular or jagged; therefore, a pair of edge trimmer members 24 and 26 are provided. The edge trimmer members 24 and 26 have respectively serrated cutting faces 28 and 30. Conventional files have been found to be extremely well suited to form the edge trimmer members as they embody good serrated cutting faces with excellent cutting action, and are easily obtainable as stock items. The edge trimmer member 24 is provided with a pair of longitudinally spaced bolts 32 and 34 which are disposed to extend respectively through slots 36 and 38 formed in the chute 22. The bolts have

conventional nuts (not shown) threaded thereon on the rear side of the chute 22 which will secure the edge trimmer member 24 against the chute in a selected angular position as will be described presently. The edge trimmer member 26 is also provided with a pair of longitudinal spaced bolts 40 and 42 which are disposed to extend through slots 44 and 46 formed in the chute 22. Also, nuts (not shown) are threaded on the ends of the bolts 40 and 42 on the rear side of the chute 22 to secure the edge trimmer member against movement in a desired position.

The slots 36, 38, 44 and 46 may be of any convenient width and length, it being understood that the upper slots 36 and 44 are usually twice the width of the lower slots 38 and 46 so as to permit a variation in the angle of the cutting faces 28 and 30 with respect to the edge of the strip 20. For example, in one embodiment, the upper slots 36 and 44 are ½" wide and the lower slots 38 and 46 are ¼" wide, the lower surfaces of the upper slots and upper surfaces of the lower slots being spaced 1½" apart. Using 5/16" bolts 32, 34, 40 and 42 on 2" centers to secure the trimmer members 24 and 26 in the slots, the angle of mounting of each of the trimmer members with respect to the strip 20 may be readily adjusted from 0° to about 32°. It will be of course appreciated that lock washers or plates may have to be used to provide contact surfaces for the nuts at the rear of the chute.

With the arrangement as described, the trimmer members 24 and 26 can be adjusted laterally for various strip widths, and the amount of metal powder removed from the edge of the strip at any given width setting is controlled by varying the angle of the cutting faces 28 and 30 with respect to the strip. It will be also appreciated that each of the edge trimmer members 24 and 26 can be adjusted separately to compensate for different conditions at the opposite edges of the strip permitting different amounts of metal removal as special conditions so require. However, normally the adjustment of each of the edge trimmer members 24 and 26 will be the same so that equal amounts of metal powder will be removed from the opposite edges of the strip.

As the "green" strip emerges from the rolls 12 and 14, it passes between the trimmer members 24 and 26. The serrated faces 28 and 30 act against the edges of the strip 20 to remove the compacted edge material which will slide down the chute 20 and can be collected in any suitable receptacle (not shown). The edge of the strip 20 as it emerges from between the trimmer members will be smooth and even. The trimmed "green" strip may thereafter be processed, as by sintering and rolling, by conventional and well-known processes into finished strip.

Although one embodiment of this invention has been shown and described, various adaptations and modifications can be made without departing from the scope of the appended claims.

I claim:

1. In a rolling mill for compacting metal powder into strip wherein a pair of rolls are journalled for rotation and the powder is fed between the rolls and exits therefrom as a compacted strip the improvement which comprises first and second trimmer members disposed in spaced relation on the exit side of the rolls adjacent the opposite edges of the strip, each of said trimmer members having elongated cutting face means disposed to contact the edge of the strip, and means to position the trimmer members to provide a decreasing distance between the cutting face means thereof along the path of travel of the strip in the direction of travel thereof whereby the cutting face means will angularly engage the edges of the strip and progressively remove the edge material

as the strip passes between the trimmer members to thereby provide smooth, even edges on the strip.

2. The combination of claim 1 wherein each of said cutting face means is in the form of a serrated surface.

3. In a rolling mill for compacting metal powder into strip wherein a pair of rolls are journalled for rotation and the powder is fed between the rolls and exits therefrom as a compacted strip the improvement which comprises, first and second trimmer members disposed on the exit side of the rolls adjacent the opposite edges of the strip, each of said trimmer members having an elongated serrated surface disposed to contact the edge of the strip, and means to selectively position each of the trimmer members to provide a selectable decreasing distance between the serrated surfaces thereof along the path of travel of the strip in the direction of travel thereof whereby the serrated surfaces will angularly engage the edges of the strip and progressively remove the edge material as the strip passes between the trimmer members to thereby provide smooth, even edges on the strip.

4. In a rolling mill for compacting metal powder into strip of various widths wherein a pair of rolls are journalled for rotation and the powder is fed between the rolls and exits therefrom as a compacted strip the improvement which comprises, a support member disposed on the exit side of the rolls, first and second trimmer members mounted on said support member adjacent the opposite edges of the strip, each of said trimmer members having elongated cutting face means disposed to contact the edge of the strip, and means to selectively laterally and angularly position the trimmer members

to provide a decreasing distance between the cutting face means thereof along the path of travel of the strip in the direction of travel thereof whereby the cutting face means will angularly engage the edges of the strip and progressively remove the edge material as the strip passes between the trimmer members to thereby provide smooth, even edges on the strip.

5. The combination of claim 4 wherein said means to selectively position the trimmer members includes bolt and slot means disposed to secure said trimmer members to said support member at the selected positions.

6. In a rolling mill for compacting metal powder into strip of various widths wherein a pair of rolls are journalled for rotation and the powder is fed between the rolls and exits therefrom as a compacted strip the improvement which comprises a chute disposed on the exit side of the rolls and disposed to engage the strip as it exits from the rolls, said chute having first and second spaced slots adjacent each edge of the strip, each of said slots extending generally normal to the path of travel of the strip, first and second trimmer members, each of said trimmer members having serrated faces, and bolt means disposed to extend through said slots and said trimmer members to secure said trimmer members to said chute means with the serrated faces of said trimmer members angularly disposed to engage the edges of the strip.

No references cited.

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