

Jan. 17, 1967

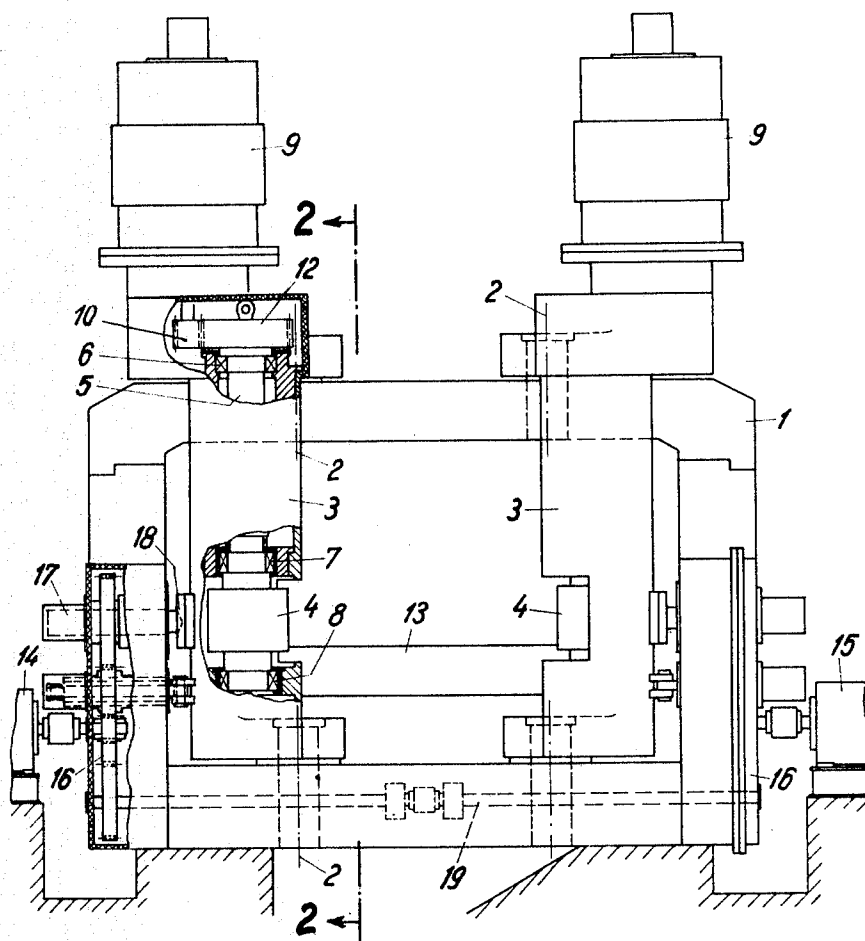
W. BONHOFF
ROLLING MILL STAND

3,298,215

Filed Nov. 27, 1963

4 Sheets-Sheet 1

Fig. 1



Inventor:

W. Bonhoff
By Ernest G. Houtz
Attorney

Jan. 17, 1967

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Fig. 3

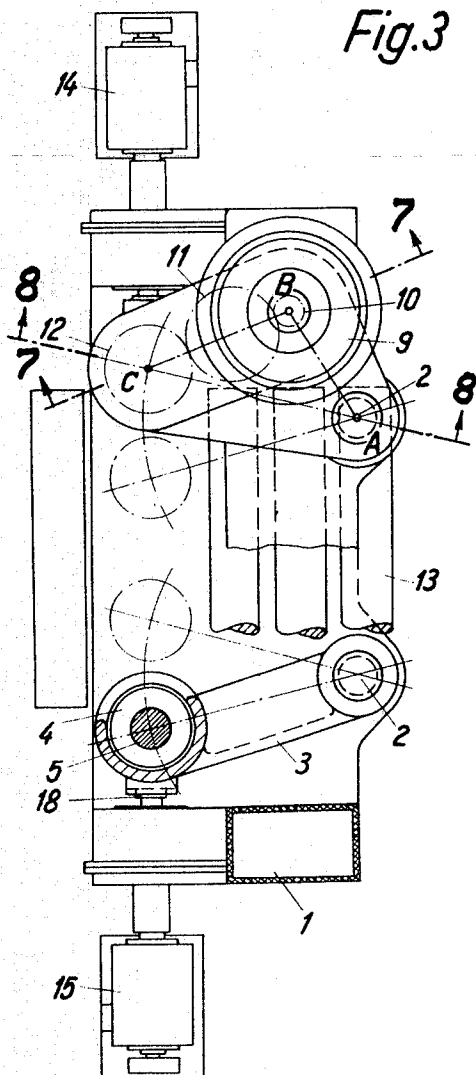
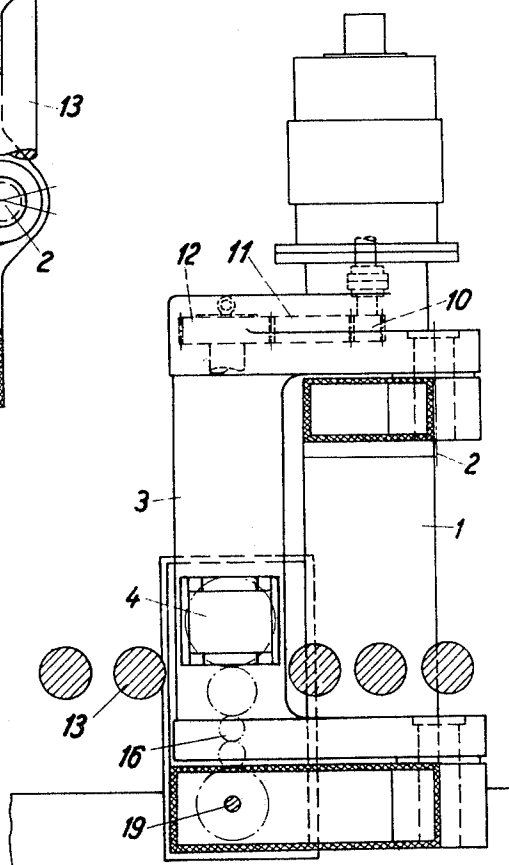


Fig. 2



Inventor:
Willi Bonhoff
By Ernest P. Montague
attorney

Jan. 17, 1967

W. BONHOFF
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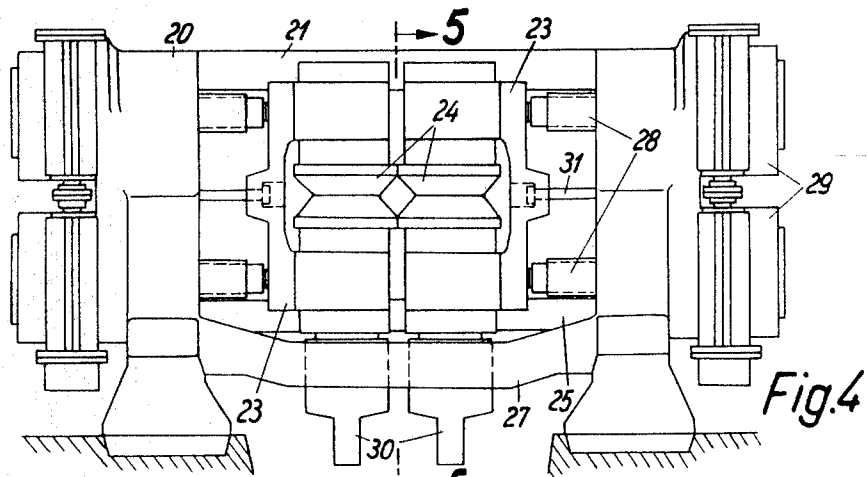


Fig. 4

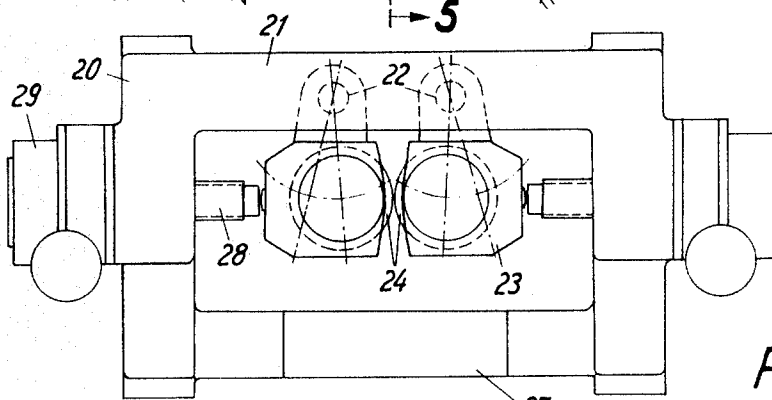


Fig. 6

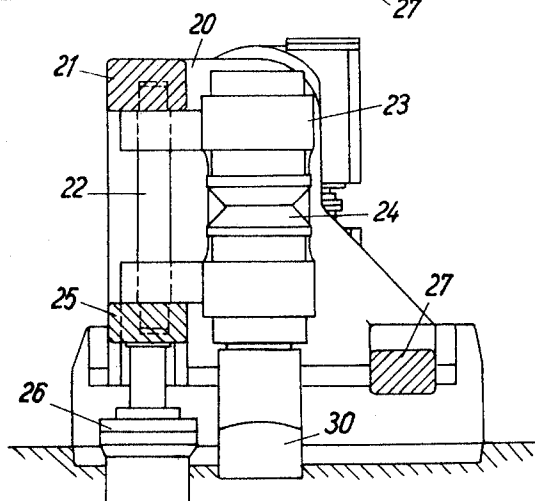


Fig. 5

Inventor:
Willi Bonhoff
By *August Koutagne*
attorney

Jan. 17, 1967

W. BONHOFF
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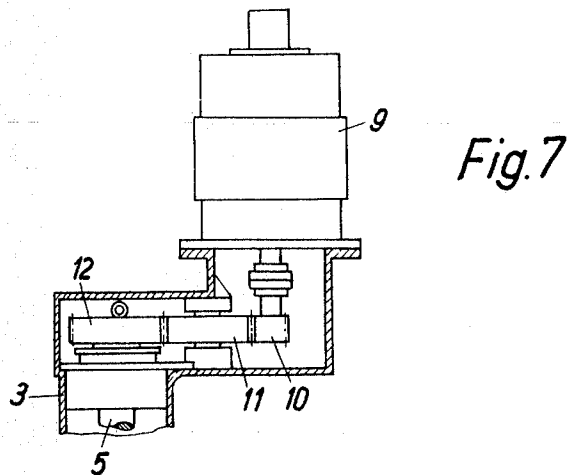


Fig. 7

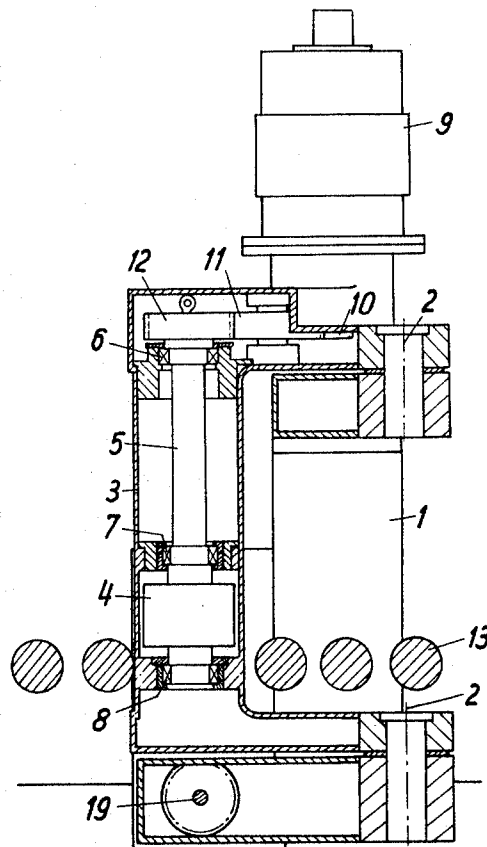


Fig. 8

Inventor:

Willi Bonhoff
By *[Signature]*
Attorney

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3,298,215

ROLLING MILL STAND

Willi Bonhoff, Essen, Germany, assignor to Beteiligungs- und Patentverwaltungsgesellschaft mit beschränkter Haftung, Essen, Germany, a corporation of Germany

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4 Claims. (Cl. 72-238)

The present invention relates to rolling mill stands, the rolls of which are disposed in stand accessories connected with the stand for a swiveling movement.

An up-set stand for rolling mills is known, in which the up-set rolls are mounted freely floating at the lower end of axes which are upright and rotatable in roller bearings and each of the two stands, carrying the axle of the up-set rolls, can be swiveled with the rolling mill stand about a horizontal axis and, furthermore, is adjustable perpendicularly to the axis of the roll. Each up-set roll is connected with a drive motor in this up-set stand which motor is disposed together with the corresponding gear drive on a housing receiving the up-set rolls.

This rolling mill shows though an appreciably smaller design than the known up-set stands, wherein the up-set rolls are mounted in slides which move in guides of the horizontally disposed rolling mill stands and wherein long drive shafts and jointed spindles are required for the drive of the rolls. It has, however, the drawback that the arrangements of the stands, swiveling about a horizontal axis and carrying the up-set rolls, permit only a relatively neglectable clearance of the up-set rolls. Such up-set mill stands are, therefore, suitable only for the working of narrow profiles, bands or wires, where an exactly rectangular cross-section is of no great matter.

It is one object of the present invention to provide a rolling mill stand which avoids the drawbacks of the previously mentioned stands for up-set rolls and which is also suitable for the working of rolling material of larger dimensions.

It is another object of the present invention to provide a rolling mill stand which includes stand accessories receiving the rolls and being connected with the rolling mill stand to swivel about vertical axes, in order to create a still more simple and operatively safe construction.

It is still another object of the present invention to provide a rolling mill stand wherein one single stand is arranged which is designed as a closed frame to which the stand accessories transfer the roller pressure by means of pressure spindles, the stand accessories swiveling about vertical axes.

Suitably the rolling mill stand is inclined in the direction of rolling, such that the upper cross beam of the stand is disposed in front of the rolls and the lower cross beam of the stand is disposed behind the rolls. By this arrangement the stand accessories can easily be mounted and dismounted together with the rolls. Suitably the stand accessories are mounted together with the rolls, on the one hand, in the upper cross beam of the stand and, on the other hand, in a lifting tie, which is connected for lifting and lowering, respectively, with the stand for the rolls.

Upon application of the present invention to vertical up-set stands, the drive of the rolls is suitably brought about by drive motors standing on the stand accessories, and by intermediate drives disposed in the stand accessories. The longitudinal axis of the drive motors, the swiveling axis of the stand accessories and the axis of the rolls form a triangle in a top plan view thereof.

With these and other objects in view which will become apparent in the following detailed description, the

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present invention will be clearly understood in connection with the accompanying drawings, in which:

FIGURE 1 is a front elevation of a vertical up-set rolling mill stand, partly in section;

FIG. 2 is a section taken along the lines 2-2 of FIG. 1;

FIG. 3 is a top plan view of the rolling mill stand disclosed in FIG. 1, partly broken away for a better demonstration;

FIG. 4 is a front elevation of a second embodiment of a rolling mill stand;

FIG. 5 is a section along the lines 5-5 of FIG. 4;

FIG. 6 is a top plan view of the stand disclosed in FIG. 4;

FIG. 7 is a section along the lines 7-7 of FIG. 3; and

FIG. 8 is a section along the lines 8-8 of FIG. 3.

Referring now to the drawings, and in particular to FIGS. 1 to 3, the rolling mill stand comprises a frame 1 which is in its front elevation of a portal-like design. The stand accessories 3 are mounted in the frame 1 to swivel about vertically disposed axes 2, whereby the stand accessories 3 receive up-set rolls 4. The latter are mounted together with their drive shaft 5 in the stand accessories 3 by means of ball and roller bearings 6, 7 and 8, such that after swiveling out of the stand accessories 3 the up-set rollers 4 can easily be dismounted in upward direction. The driving motors 9 are arranged on the stand accessories 3 in an upright position and are connected with the drive shafts 5 by means of a spur gear drive including the gears 10, 11 and 12. The swivel axis 2 forms jointly with the longitudinal axis of the driving motor 9 and the axis of the drive shaft 5 a triangle seen in a plan view and indicated in FIG. 3 by the letters A, B and C. A roller path 13 is provided for the feeding of the goods to be rolled. Drive motors 14 and 15 are provided laterally of the frame 1 which cause the lateral swiveling of the stand accessories 3 and the setting of the up-set rolls 4 by means of an intermediate gear drive 16 and pressure spindles 17 having pressure members 18. The intermediate gear drives 16 are interconnected by a shaft 19 which serves the purpose of synchronization of the lateral setting of the oppositely disposed up-set rolls 4.

Referring now to FIGS. 4 to 6, which disclose a second embodiment of the stand, the rolling stand 20 is of a yoke-like structure and is inclined forwardly in rolling direction for an angle of about 45°. The stand accessories 23 are mounted to swivel about bolts 22 secured in an upper cross beam 21 of the stand 20, which stand accessories 23 receive the rolls 24. The bolts 22, about which the stand accessories 23 swivel, are furthermore mounted in lifting beams 25, which can be lifted and lowered, respectively, by means of a lifting device 26, whereby the stand accessories 23 form an open U in this embodiment. Upon lowering of the lifting beams 25, the stand accessories 23 can be dismantled in the simplest manner laterally together with the bolts 22 and the rolls 24 beyond the lower cross beam 27 of the rolling stand 20.

Pressure screws 28 are provided, against which the stand accessories 23 are supported in the rolling stand 20. A setting device 29 for the pressure screws 28 is arranged. The rolls 24 are driven by drive motors (not shown) and by a gear drive and jointed spindles, which are connected with the engagement ends 30 of the rolls 24.

Returning devices 31 are further arranged in the lateral posts of the rolling stand 20 which serve the purpose of pressing the stand accessories 23 against

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the rolling stands 20 by means of the pressure screws 28 without play.

The horizontal distance between the upper cross beam 21 and the lower cross beam 27 of the rolling stand 20 is chosen such that the driving parts can be dismounted in upward direction upon removal of the rolls 24 with the stand accessories 23.

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

I claim:

1. A rolling mill stand comprising
 - a frame,
 - stand accessories mounted in said frame to swivel about a vertical axis, and
 - a roll secured in each of said stand accessories and swiveling with the latter about said vertical axis, said frame comprising a closed yoke, pressure spindles operatively projecting laterally from said frame for engagement with said stand accessories, thereby transferring the rolling pressure from said stand accessories to said frame, said frame being upwardly inclined in rolling direction and comprising an upper cross beam and a lower cross beam, and
 - said upper cross beam being disposed in a vertical projection in front of said rolls and said lower cross beam being disposed behind said rolls.
2. The rolling mill stand, as set forth in claim 1, where-

in

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said frame comprises an upper cross beam and a lower cross beam, means for lifting and lowering, respectively, said lower cross beam, bolts mounted in said upper cross beam and in said lower cross beam, and said stand accessories swiveling about said bolts.

3. The rolling mill stand, as set forth in claim 1, which includes

a drive motor mounted with its driving axis in vertical direction on top of each of said stand accessories, and a reduction gear drive operatively connected with each of said drive motors and disposed in said stand accessories.

4. The rolling mill stand, as set forth in claim 3, wherein

the driving axis of said drive motors, the swinging axis of said stand accessories and the longitudinal axis of said form in a plan view the corners of an imaginary triangle.

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RICHARD J. HERBST, *Primary Examiner*.

L. A. LARSON, *Assistant Examiner*.