

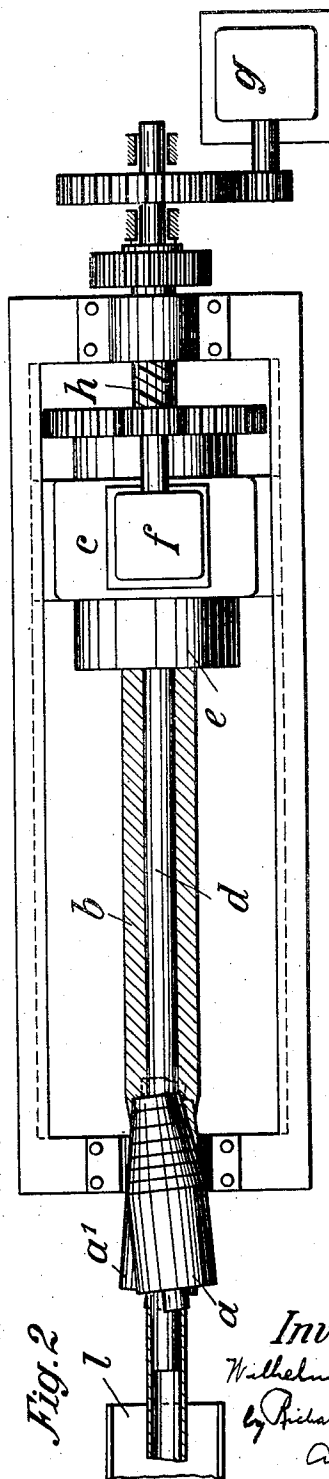
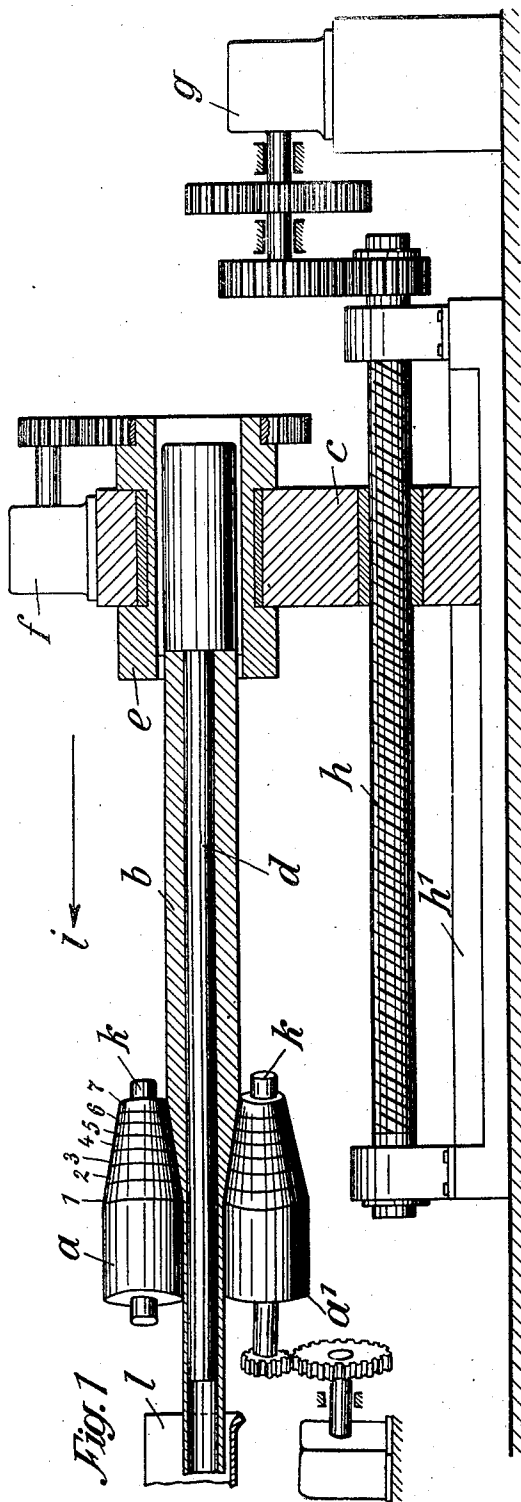
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APPARATUS FOR ROLLING SEAMLESS TUBES

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APPARATUS FOR ROLLING SEAMLESS
TUBESWilhelm Widuch, Wielkie Hajduki, Poland, as-
signor to Karl Brehme, Hollister, Calif.Application August 12, 1932, Serial No. 628,603
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2 Claims. (Cl. 80-13)

Patent applications have been filed in the following foreign states: Germany, Serial W. 85 393 I/7a, filed March 17, 1931 (not yet granted) and Poland, Serial No. 35 473/18 038, filed August 14, 1931.

The invention concerns a process and apparatus for drawing strong walled hollow sleeves or hollow blocks into seamless tubes by slope rolling.

In the hitherto known slope rolling process, the force bringing about the rolling process consists usually exclusively or mainly in the torque applied to the rolls. In the known skew rolling apparatus, the driven rollers have usually the form of one or more conical frustums, and on account of the slanting position of their axes of rotation to the long axis of the piece under treatment exert a pull as well as a rotary action on the latter, by which an internal overstrain of the material is brought about.

According to the invention the manufacture of seamless tubes by slope rolling of pre-formed hollow bodies arranged on a mandrel is carried out by setting into rotation the hollow body gripped by a gripping apparatus and the mandrel, and the freely running skew rollers are fed by a shoving forward of the piece under treatment effected by a special drive. Instead of a shoving forward of the piece under treatment there can naturally be provided vice versa a shoving forward of the roller mechanism against the hollow body which has been set in rotation.

The rolls for carrying out the new skew rolling process consist according to the invention of a freely running conical part, which preferably is formed of several loose rotatable rings, and an independently rotatable cylindrical part, which in general is also not driven, but however, especially with heavy rolls, in given cases may be driven. On account of the condition that the conical part of the rolls which effects the drawing, is not driven, and consists of single rotatable rings, any internal overstrain of the material by rotation in the skew rolling is avoided since the running of the conical parts, adapts itself at all points to the circumferential speed of the work piece. The independently rotatable cylindrical part, fastened to the conical part of the rolls, which in certain cases may be auxiliarily driven effects a complete smoothing and to a certain degree even a polishing of the rolled tube, so that according to the new process a well finished product of uniform gauge and of high quality can be obtained.

The shoving forward of the work piece effected

by a special drive against the rollers or vice versa the feeding of the roller mechanism against the piece under treatment is according to the invention so regulated that it is adapted to the drawing which the rollers, especially the cylindrical part of the same, exert on account of their more or less oblique arrangement on the piece which is set in rotation, since the slope rollers naturally, since they are not driven, rotate with the rotating body. Thereby damage to the texture of the product caused by the drawing effect of the skew rollers is avoided. The drawing illustrates by way of example, a skew rolling mill constructed according to the invention.

Figure 1 is an elevation partly in section of the rolling mill.

Figure 2 is a plan view of Fig. 1.

The two skew rollers *a* and *a'*, of which three or more can be provided with work pieces of large size are adjustably arranged in known manner in a suitable bearing apparatus which for the sake of clearness is not shown in the drawing. Each roller consists of loose rotatable rings 1-7 and an independently rotatable cylindrical part which is either loosely mounted on the roller axle *k* or fastened thereto.

The hollow body *b* to be rolled is fixed on a mandrel *d* and is gripped in a chuck *e*. This fastening can also be effected in a simpler manner, if the rear end of the mandrel is formed angularly and the hollow body pressed thereon.

In the rolling process, the rotatably mounted gripping apparatus *e* as well as the piece under treatment *b* gripped by or pressed on to the mandrel is mounted on the pillar *c* and is set in rotation by the electromotor *f* whereby the piece under treatment *b* is fed between the skew rollers. The chuck carrying pillar *c* is fed forward on the feeding bed *h'* by means of a feeding spindle *h* set into rotation by a special drive, such that the feeding speed is regulated with reference to the angular position and the diameter of the cylindrical part of the slope rollers and corresponding to the stretch ratio of the material.

In so far as tubes of large diameter are to be rolled and correspondingly heavy rollers are provided, the cylindrical parts of the rollers can also be auxiliarily driven as illustrated in a diagrammatic manner for the roller *a'* in Figure 1.

The tube is then rolled down without a remnant from the mandrel. In other cases the skew rollers are radially displaced from the tube, on stopping the drive whereupon the tube which is ready is removed from the mandrel.

The leading out channel 7 serves for taking up the prepared tube.

The advantages of the new skew rolling process consist, in besides a far reaching economy of the material, especially in that both tubes of small diameter, and tubes of very large diameter can be obtained with any especially thin walls, accurate in the desired dimensions as a product ready for sale in a relatively simple and cheap apparatus. The subsequent working of the tube is unnecessary. Corresponding to the smaller strain on the material, the driving force necessary is also considerably smaller. The roller mandrels undergo on account of the steady, uniform rolling only a small strain and can therefore be made of cheap qualities of steel, also with the object of cooling, in certain cases can be formed hollow. The rollers can be made in the usual lathes. Special working machines as are necessary for the production of calibrated rollers, are not required. The otherwise necessary stock of calibrated rollers, tools, mandrels, sleeves and spindles is considerably reduced.

For going over to another tube dimension a change of rolls is not in general necessary rather a change of the mandrel, and an alteration in the roller distance suffices.

I claim:

1. A machine for rolling in a single operation a seamless tube having a thin wall from a thick

hollow body, comprising a cylindrical mandrel of a length equal at least to the length of the thick hollow body, at least two freely rotatable conical rollers arranged askew to the said mandrel and each formed of a number of separate freely rotatable discs, means for rotating the said mandrel with the thick hollow body mounted on the said mandrel and means for introducing the said mandrel together with the said thick body between the said rollers and for causing a relative longitudinal displacement between the said mandrel and said rollers corresponding to the stretching of the said thick body.

2. A machine for rolling in a single operation a seamless tube having a thin wall from a thick hollow body, comprising a cylindrical mandrel of a length equal at least to the length of the thick hollow body, at least two freely rotatable conical rollers arranged askew to the said mandrel, at least two positively driven cylindrical rollers arranged concentrically with and in rear of said conical rollers, means for rotating the mandrel and the hollow body and means for introducing the mandrel together with the said thick body between the said conical rollers and for causing a relative longitudinal displacement between the said mandrel and said conical rollers corresponding to the stretching of the said thick body.

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