March 15, 1932. R. BUCHWALD 1,849,973

ROLLING TUBE

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Fig. 2

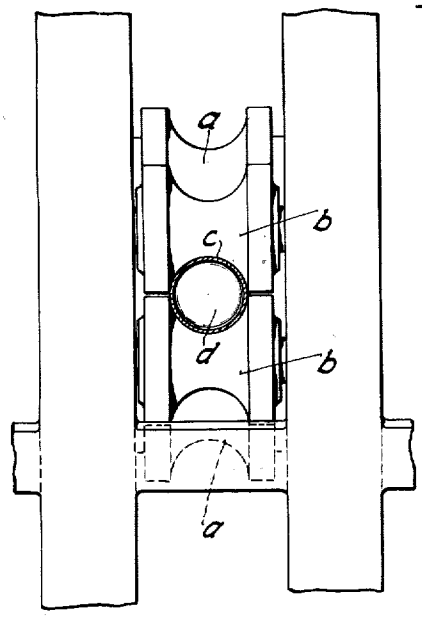


Fig. 1

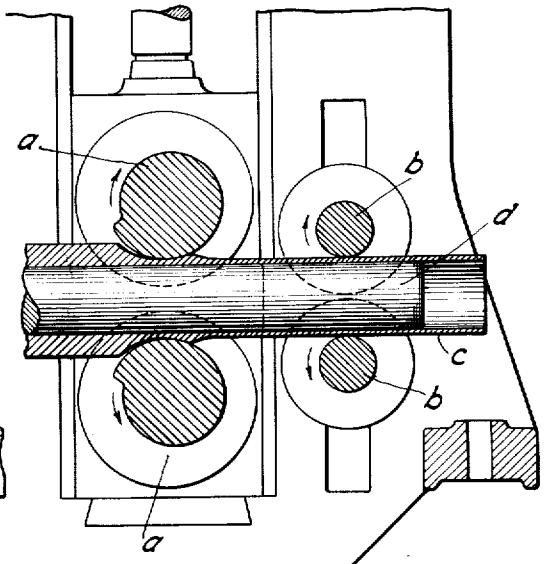
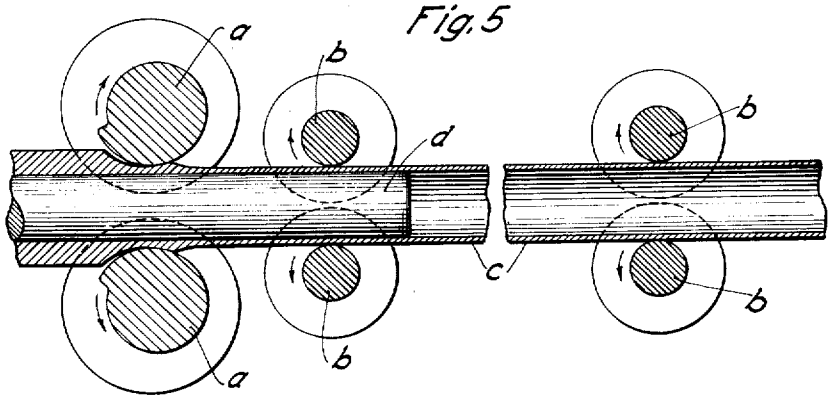


Fig. 5



INVENTOR
Reinhard Buchwald
by Howson and Howson
Attys.

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Fig. 3

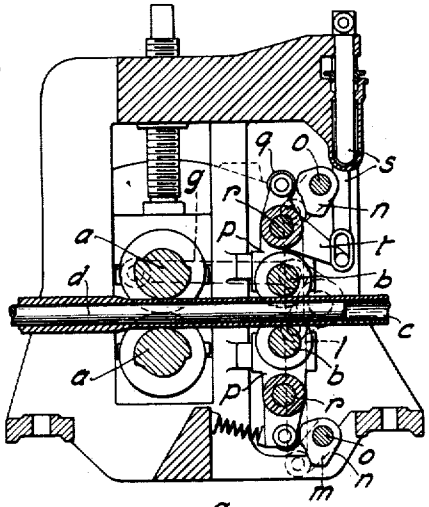
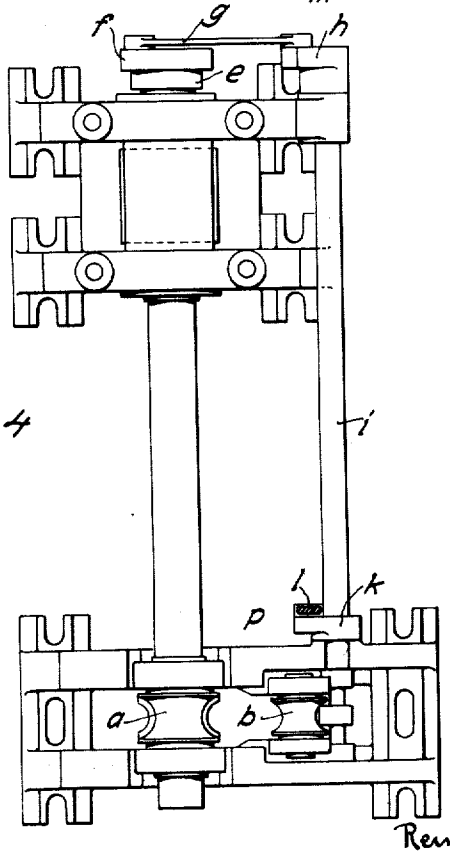


Fig. 4



INVENTOR
Reinhard Buchwald
by Howson and Howson
Attys.

Patented Mar. 15, 1932

1,849,973

UNITED STATES PATENT OFFICE

REINHARD BUCHWALD, OF DUSSELDORF-RATH, GERMANY

ROLLING TUBE

Application filed June 22, 1929, Serial No. 373,040, and in Germany June 26, 1928.

The purpose of the present invention is to provide a simple and practical device by means of which simultaneously with the rolling of a tube and in the same heat the finishing and sizing operation can be carried out.

For the rolling operation use is made of a pilgering mill.

The finishing and sizing rolling mills for pilger-rolled tubes used up to the present time are rolling mills with special power drive arranged separately from the pilger-way, that is to say plants which will involve high initial cost and expensive operation as well as a repeated heating of the tube, irrespective of the large amount of space required for the erection of such plants. A further and important disadvantage with known finishing and sizing rolling mills is to be seen in the fact that the pilger humps are forced inwards.

The present invention consists in that the finishing and sizing rolls actuated by means of rolls are arranged on the pilger housing directly or in the rear thereof in such a manner, that they will act in longitudinal direction on the mandrel, producing at the same time and in the same heat a tube during the step-wise pilger-method, which will possess smooth interior and exterior surfaces.

A mode of execution according to the present invention is shown by way of example in the drawings in which

Figure 1 is a diagrammatic side elevation of the device for carrying out the rolling process according to this invention;

Figure 2 is a rear view.

Figures 3 and 4 show in vertical section and in plan a device according to the invention, in which the individual parts can be made out, and

Figure 5 shows a modification of the arrangement according to Figure 1.

In all the Figures *a* denotes the pilgering rolls operating in well known manner and *b* are the finishing or sizing rolls respectively which are freely rotatable and which will operate as so-called idle rollers, that is to say they are not driven. *c* represents the pilgered tube located upon a pilgering mandrel *d*. The sizing and finishing rolls form a circular closed pass. The rolls are journalled in the pilger housing proper or in the rear thereof, but at any rate rather close, so that the finishing and sizing operation takes place simultaneously and in the same heat as the pilgering process. Said finishing and sizing operation is carried through in such a manner that the rolls will still operate or roll on the mandrel *d*, but the said operation may also be carried out outside of the latter.

In the modification according to Figures 1 and 2 two finishing or sizing rolls *b* are provided, but there may also be employed more than two rolls, as is illustrated in Figure 5.

In that instance one pair of rolls may be used for sizing and the other pair for the finishing operation.

Since a pilgering mill is employed the sizing or finishing rolls must be opened out during the known turning of the tube, that is to say, they must be distanced somewhat.

For that purpose an arrangement may be employed, such as is represented in Figures 3 and 4.

Upon the axle end of the upper roll *a* a crank *f* is mounted, which will reciprocate the lever *h* and the shaft *i* by means of a linking rod *g*. A lever *k* mounted on the said shaft *i* will transmit this motion by means of a rod *l* to the levers *m* and cams *n*, secured to shafts *o* journalled in the frame or housing. The finishing rolls *b* are supported in swinging levers *p*, which in their turn are again mounted on shafts *r*.

During the movement of the shaft *i* the cams *n* will bear upon rollers *q* arranged in the swinging lever *p* (see Figure 3) and lift the rolls *b* from the tube treated.

The material advantage of the arrangement according to the present invention consists in that in contradistinction to known arrangements used up to the present high initial costs as well as the re-heating furnace will be dispensed with. Thus there will be a considerable saving in money, time and space and besides a superior product will be obtained.

I claim:

1. The improvement in the art of rolling

tubes which comprises passing a hollow billet upon a mandrel bar between pilgering rolls and then between freely rotatable finishing and sizing rollers with a circular closed pass arranged near the pilgering rolls in such a manner, that the finishing and sizing rollers roll over the pilgering mandrel.

2. The improvement in the art of rolling tubes which comprises passing a hollow billet upon a mandrel bar between pilgering rolls and then between freely rotatable finishing and sizing rollers with a circular closed pass arranged near the pilgering rolls in such a manner, that the finishing and sizing rollers roll over the pilgering mandrel, turning the tube and holding said finishing and sizing rollers during the turning of the tube.

3. The improvements in the art of rolling tubes which comprises passing a hollow billet upon a mandrel bar between pilgering rolls and then between freely rotatable finishing and sizing rollers with a circular closed pass arranged near the pilgering rolls in such a manner, that the finishing and sizing rollers roll over the pilgering mandrel, turning the tube and opening said finishing and sizing rollers by cam means for the turning of the tube.

In testimony whereof I have signed my name to this specification.

REINHARD BUCHWALD.

CERTIFICATE OF CORRECTION.

Patent No. 1,849,973. **Granted March 15, 1932, to**

REINHARD BUCHWALD.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 17, claim 2, after the word "rollers" insert the word open; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of May, A. D. 1932.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.

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