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SEPARATE YIELDABLE PRESSURE MEANS ON SLIDE OF PIVOTED TYPE OF PIPE BENDER

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1 Claim. (Cl. 153—40)

It is known to bend a pipe by winding it on a rotating bending roller, the pipe being maintained in the groove of the bending roller by two supporting rollers.

It has also been suggested, particularly in the case of thin pipes, to bring the pipe up to the bending roller by passing it through a supporting sleeve secured to the worktable which permits omission of one of the supporting rollers so that the pipe rests only on one roller when it is applied in the groove of the bending roller.

The present invention relates to a supporting sleeve for bending pipes, which is characterized by the fact that the part of the sleeve which is applied against the region of the pipe that becomes the outer region of the bend, instead of being fixed as in the known case, is mobile and can be driven in a translating motion by the pipe itself during the winding of this pipe on the bending roller.

The sliding half-sleeve thus obtained is applied against the pipe up to the entrance of the latter in the groove of the bending roller, and the supporting rollers, instead of being applied against the pipe as in known devices, are applied against said supporting sleeve which, maintained by these rollers, advances in rectilinear direction, while the pipe is wound on the bending roller.

The two supporting rollers provided to apply the mobile sleeve against the pipe, instead of being connected to a single pressure source, are preferably independent of each other, so that the mobile slide can assume during the bending operation, in case the bending stress changes, at the same time as the pipe an oblique position with regard to the usual feeding direction of the pipe.

The invention will best be understood upon consideration of the following detailed description of the illustrative embodiments thereof when read in conjunction with the accompanying drawings in which:

Fig. 1 represents in plan view the device for bending the pipe, the subject of the invention.

Fig. 2 is the section along line II, II of Fig. 1;

Fig. 3 is a view similar to Fig. 1, showing the pipe in the course of bending with the displacement of the mobile supporting sleeve.

The device according to the invention comprises in known manner a bending roller 1 whose groove has a cross section adapted to the cross section of the pipe 3 which is to be bent. This roller comprises a catch 2 which locks the end of the pipe 3. The pipe is brought into the groove of the bending roller by means of a supporting sleeve which consists of two parts, a sliding part 4, and a fixed part 5. Part 5 of the supporting sleeve which is applied against the part of the pipe that becomes the inner region of the final bend, is fixed to the work-

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table. On the other hand, the upper part 4 which is applied against the part of the pipe that becomes the outer or elbow region of the final bend, can slide on the lower part 5 so that it accompanies the pipe 3 during its advance, while it is bent on the roller 1. The supporting rollers 6, 7, instead of being applied directly on the pipe 3, as in the known bending devices, are applied on the slide part of the supporting sleeve as can be seen from the drawing.

A heating device 8 can be provided at the entrance of the pipe on the bending roller 1 to heat the pipe in the region which becomes the inner region of the bend, before it is wound on the roller.

The pipe 3 being engaged by the catch 2 in the position represented in Fig. 1, it is sufficient to turn the bending roller in the direction of the arrow A to effect the winding of the pipe 3 on the roller and to produce the bend, as it can be seen from Fig. 3. During this motion, the slide 4 is displaced by a rectilinear motion in the direction B of the pipe feed and can escape from the supporting rollers 6, 7 at the end of the motion, i. e. when the pipe has been bent by 180 deg. for example. After that, the slide 4 returns to its original position for the treatment of the following pipe.

According to the invention, the two rollers 6, 7 instead of being applied on the slide 4 by a single pressure device acting in the direction of the arrows C, are applied independently. Besides, the axle D of the roller 7 is no longer secured to the worktable so that this roller 7 can in some cases move away slightly, as it can be seen from the dot-dashed lines in Fig. 3. When variations in the resistance offered by the pipe occur during the bending, the necessary maintenance of the pipe in the feeding direction, represented in Fig. 1, can lead to folds. But thanks to the independence of the rollers 6, 7 and under the effect of the resistance variations, the pipe 3 can easily swing so as to move, for example, into the position 3', represented by the dot-dashed lines in Fig. 3. It is accompanied in this motion by the mobile slide 4 which then moves into the position 4', which facilitates instantly the operation by diminishing the resistance to bending. After that the pipe 3 assumes again its normal position in the following moments. This elasticity in the operation of the supporting slide 4 permits obtaining the bends of the pipes without folds.

It is understood that the cross section of the pipe can be cylindrical or oval and that the grooves provided in the bending rollers 1 as well as in the supporting sleeves 4, 5 are designed accordingly.

Another advantage of the mobile supporting slide 4 is that it permits the treatment of pipes 3 which have on the elbow or outer region of the bend, necks or half-bulbs that can be housed conveniently in the interior of the hollow spaces provided in the mobile slide 4, the neck escaping from the hollow space during the bending at the time the region of the pipe holding them assumes its bending radius on the bending roller. It would be impossible to treat straight pipes presenting outgrowths of this type with bending devices where the supporting rollers 6, 7 are applied directly on the pipe.

It goes without saying that minor modifications can be effected on the embodiment without departing from the spirit of the invention.

What I claim is:

In an apparatus for bending tubes having a grooved

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bending roller, means engaging the tube and adapted to draw it around said roller to form a bend therein, a slide member engaging the outer surface of said tube in a position outwardly of said roller and adapted to move with said tube toward said roller, two separate guiding means 5 mounted in spaced relation and contacting said slide member for maintaining and pressing it into engagement with said tube and maintaining said tube in contact with said roller as the tube is drawn around the roller, and means for independently pressing said guiding means toward 10 said slide member, said means yieldably engaging said slide and accommodating its movements with the tube.

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