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54 **Improvements in helically formed tubing.**

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Description

This invention concerns improvements in and relating to helically formed tubing.

It is known to form metal tubing by a process comprising the steps of forming marginal flanges on an elongate sheet metal strip, feeding said strip longitudinally to a forming head whereby said strip becomes wound helically to bring the opposite edges of the strip and the associated flanges into mating engagement, and clinching together the mating flanges of the strip to form a locked seam by means of clinching rollers which comprise an external clinching roller having a groove shaped in cross-section to correspond with the profile of a locked seam to be formed on the external side of the wall of the tubing and an internal support roller having a cylindrical support surface facing said groove of the clinching roller, see for example G.B-A-1599379.

Such helically formed lock-seam tubing has a variety of uses. The tubing is usually of generally cylindrical configuration, although for some purposes it is desired that the tubing be corrugated. Corrugation of lock-seam tubing requires additional manufacturing steps that correspondingly increase the cost of the tubing.

Accordingly an object of the invention is to provide a simple means of forming corrugated, helically wound tubing.

In accordance with the invention this object is achieved by providing the external clinching roller with a further groove into which the other roller extends, whereby the rollers are effective simultaneously to form the locked seam and to displace the seam radially away from the plane of the metal strip in an outward direction, thereby forming an outwardly projecting helical corrugation in the finished tube.

Further preferred features and advantages of the invention will become apparent from the accompanying description of one example of the invention, taken in conjunction with the accompanying drawing and any accompanying Claims.

The single figure of the accompanying drawing is a sectional elevation of the forming head of a machine for the production of helically wound lock-seam tubing, shown in the process of forming such tubing.

Referring to the drawing, the reference numeral 1 illustrates the forming head of a machine for the production of helical lock-seam tubing. The machine is of generally known type including means for feeding a metal strip into the forming head 1, and means for forming on the longitudinal edges of the metal strip flanges that are interlocked with one another in the finished tubing. Such features of the machine will be familiar to one skilled in the art of the production of helically wound lock-seam tubing, and will therefore not be further described in detail.

Suffice it to say that at the point in the machine

at which the finished lock-seam is produced, the machine is provided with a pair of clinching rollers 2 and 3, of which the roller 2 is supported for rotation within the tubing at the point of formation of a closed helix of the metal strip, via a bracket 4 secured to the forming head 1. The roller 3 is mounted externally of the tubing via a further bracket 5 secured to the frame of the machine in a manner not shown.

The external roller 3 has a circumferential groove 6 which, in cooperation with the circumference of roller 2 serves to effect closure and compression of the lock-seam of the tubing substantially in the manner of known machines. However, unlike known machines the groove 6 of roller 3 is located within a recess defined by a further groove 7 of the clinching roller 3. The roller 2 is of correspondingly larger diameter, or is displaced radially relatively to the axis of the formed tubing, so that it extends into the groove 7 of the clinching roller 3.

As a result of the above described construction of rollers 2 and 3, a lock-seam 8 formed on the finished tubing is displaced outwardly so that it lies at the crest of a helical corrugation 9 formed in the finished tubing.

Accordingly, the invention provides for the production of helically corrugated lock-seam tubing wherein the lock-seam and the corrugation are formed simultaneously in a simple manner without the requirement of additional post-forming steps as needed in hitherto known processes.

Claims

1. A process for the formation of helically seamed tubing comprising the steps of forming marginal flanges on an elongate sheet metal strip, feeding said strip longitudinally to a forming head whereby said strip becomes wound helically to bring the opposite edges of the strip and the associated flanges into mating engagement, and clinching together the mating flanges of the strip to form a locked seam by means of clinching rollers which comprise an external clinching roller (3) having a groove (6) shaped in cross-section to correspond with the profile of a locked seam to be formed on the external side of the wall of the tubing and an internal support roller (2), having a cylindrical support surface facing said groove (6) of the clinching roller (2), characterised in that the external roller (3) has a further groove (7) into which the other roller (2) extends whereby the rollers (2,3) are effective simultaneously to form the locked seam and to displace the seam radially away from the plane of the metal strip in an outward direction, thereby forming an outwardly projecting helical corrugation in the finished tube.

2. A machine for the formation of helically wound tubing comprising a forming head (1) associated with

means for feeding thereto an elongate metal strip having marginal flanges, whereby said strip is wound helically to bring said flanges into mating engagement, and clinching rollers (2,3) for clinching together said flanges to form a locked seam, said clinching rollers (2,3) comprising an external clinching roller (3) having a groove (6) shaped in cross-section to correspond with the profile of a locked seam to be formed on the external side of the wall of the tubing and an internal support roller (2), having a cylindrical support surface facing said groove (6) of the clinching roller (2), characterised in that the external roller (3) has a further groove (7) into which the other roller (2) extends whereby the locked seam is radially outwardly displaced during clinching to form an external helical corrugation in the tube.

Patentansprüche

1. Verfahren zur Herstellung von Schraubennahtrohren umfassend die Stufen der Bildung von Randflanschen eines Blechstreifens, der Zuführung dieses Blechstreifens in Längsrichtung zu einem Formkopf, wobei der Streifen schraubenförmig aufgewickelt wird um die gegenüberliegenden Kanten des Streifens und die zugeordneten Flansche in Eingriff miteinander zu bringen sowie das Verbördeln der aneinanderliegenden Flansche des Streifens zur Bildung einer Verriegelungsnaht mit Hilfe von Bördelrollen, die eine äußere Bördelrolle (3) mit einer Nut (6) umfassen, deren Querschnitt mit dem Profil der auf der Außenseite der Wand des Rohrs zu bildenden Verriegelungsnaht entspricht und einer inneren Stützrolle (2) mit einer zylindrischen, der Nut (6) der Bördelrolle (2) gegenüberliegenden Stützfläche, dadurch gekennzeichnet, daß die äußere Rolle (3) eine weitere Nut (7) aufweist, in welche die andere Rolle (2) sich erstreckt, wobei die Rollen (2, 3) so zusammenwirken, daß sie gleichzeitig die Verriegelungsnaht bilden und die Naht radial von der Ebene des Metallstreifens nach außen versetzen, wodurch eine nach außen vorspringende Sicke des fertigen Rohrs gebildet wird.

2. Vorrichtung zur Herstellung von Schraubennahtrohren mit einem Formkopf (1) mit Einrichtungen zum Zuführen eines langgestreckten Blechstreifens mit Randflanschen, wobei der Streifen schraubenförmig aufgewickelt wird um die genannten Flansche in Eingriff miteinander zu bringen, sowie mit Bördelrollen (2, 3) zum Verbördeln der Flansche zur Bildung einer Verschlussnaht, wobei die Bördelrollen (2, 3) eine äußere Bördelrolle (3) mit einer Nut umfassen, deren Querschnitt dem Profil der Verriegelungsnaht entspricht, die auf der Außenseite der Wand des Rohrs gebildet werden soll, sowie eine innere Stützrolle (2) mit einer der Nut (6) der Bördelrolle (3) gegenüberliegenden zylindrischen Abstützfläche, dadurch gekennzeichnet, daß die äußere Rolle (3) eine weitere

Nut (7) aufweist, in welche die andere Rolle (2) sich erstreckt, derart, daß die Verriegelungsnaht beim Verbördeln radial nach außen versetzt wird um eine äußere schraubenförmige Sicke im Rohr zu bilden.

Revendications

1. Procédé pour former un tube à jonction hélicoïdale sertie, comprenant les stades suivants : former des rebords marginaux sur une bande de tôle métallique allongée, amener cette bande dans le sens de sa longueur à une tête de formage, grâce à laquelle la bande est enroulée en hélice pour amener en coopération étroite les bords opposés de la bande et les rebords associés, et sertir ensemble les rebords conjugués de la bande pour former une jonction agrafée sertie au moyen de galets de sertissage, qui comprennent un galet de sertissage extérieur (3) ayant une gorge (6) dont la section transversale correspond au profil de la jonction agrafée sertie à former sur le côté extérieur de la paroi du tube et un galet de support intérieur (2), ayant une surface d'appui cylindrique en vis-à-vis de cette gorge (6) du galet de sertissage (3), caractérisé en ce que le galet extérieur (3) a une autre gorge (7) dans laquelle pénètre l'autre galet (2), d'où il résulte que les galets (2,3) coopèrent ensemble pour, simultanément, former la jonction agrafée sertie et déplacer cette jonction radialement vers l'extérieur en l'éloignant de la bande métallique, formant ainsi une ondulation hélicoïdale saillant vers l'extérieur dans le tube terminé.

2. Machine pour former un tube à jonction hélicoïdale sertie, comprenant une tête de formage (1) associée à des moyens pour lui amener une bande métallique allongée ayant des rebords marginaux, tête grâce à laquelle la bande est enroulée en hélice pour amener en coopération étroite lesdits rebords, et des galets de sertissage (2,3) pour sertir ensemble ces rebords et former une jonction agrafée sertie, ces galets de sertissage (2,3) comprenant un galet de sertissage extérieur (3) ayant une gorge (6) dont la section transversale correspond au profil de la jonction agrafée sertie à former sur le côté extérieur de la paroi du tube et un galet support intérieur (2), ayant une surface d'appui cylindrique en vis-à-vis de cette gorge (6) du galet de sertissage (3), caractérisée en ce que le galet extérieur (3) a une autre gorge (7) dans laquelle pénètre l'autre galet (2), d'où il résulte que la jonction agrafée sertie est déplacée radialement vers l'extérieur pendant le sertissage pour former une ondulation hélicoïdale extérieure dans le tube.

