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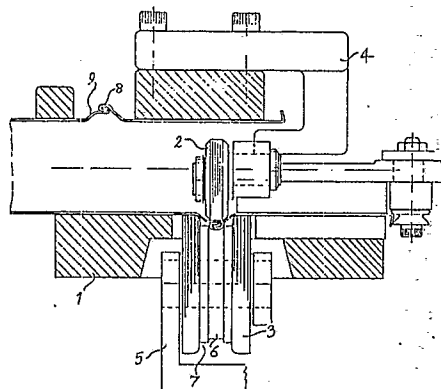
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54 Improvements in helically formed tubing.

57 Corrugated, helically formed lock-seam tubing is formed in a machine wherein clinching rollers (2,3) for closing the lock-seam (8) of the tubing are shaped so that the lock-seam (8) is displaced radially with respect to the circumference of helically wound strip defining the tubing, during the formation of the lock-seam (8), whereby the lock-seam is located at the crest of a helical corrugation (9) formed in the wall of the finished tubing.



Description

IMPROVEMENTS IN HELICALLY FORMED TUBING

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

It is known to form metal tubing by winding helically a strip of sheet metal and joining the marginal edges of adjacent helices of the metal strip by clinching together marginal flanges formed on the strip whereby the flanges are interlocked to form a seam.

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 that a pair of rollers arranged to engage internal and external surfaces of the tubing during forming thereof, in order to effect finishing of the seam in the tubing, are further so shaped and arranged that they serve the additional function of forming a helical corrugation in the wall of the tubing, in the region of the finished seam. The invention accordingly provides a novel tube forming process, a machine for carrying out such process, and an improved corrugated tube helically formed by such a process.

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 whereby the metal strip is held together in the form of a helically wound tube, characterised in that the mating flanges of the strip are clinched together by rollers so shaped and arranged that the rollers are effective simultaneously to form the locked seam and to displace the seam radially away from the plane of the metal strip thereby forming a helical corrugation in the finished tube.

2. A process according to Claim 1, characterised in that the locked seam is formed so that it projects on the external side of the wall of the tubing, and that the seam is radially displaced in an outward direction during clinching to form an outwardly projecting corrugation in the finished tube.

3. 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, characterised in that said clinching rollers (2,3) are so shaped and arranged that they effect radial displacement of said locked seam during clinching thereof whereby the finished tube has a helical

corrugation in the region of said locked seam.

4. A machine according to Claim 3, characterised in that said clinching rollers comprise a clinching roller (3) having a groove (6) shaped in cross-section to correspond with the profile of the locked seam to be formed and a support roller (2), having a cylindrical support surface facing said groove (6) of the clinching roller (2), and that one of said rollers (3) has a further groove (7) into which the other roller (2)

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extends to effect said radial displacement of the locked seam.

5. A machine according to Claim 4, characterised in that the clinching roller (3) is located externally of the path of the helically wound strip defined by said forming head (1) and that said support roller is arranged internally thereof.

6. A machine according to Claim 4 or 5, characterised in that said further groove (7) is provided in the clinching roller (3).

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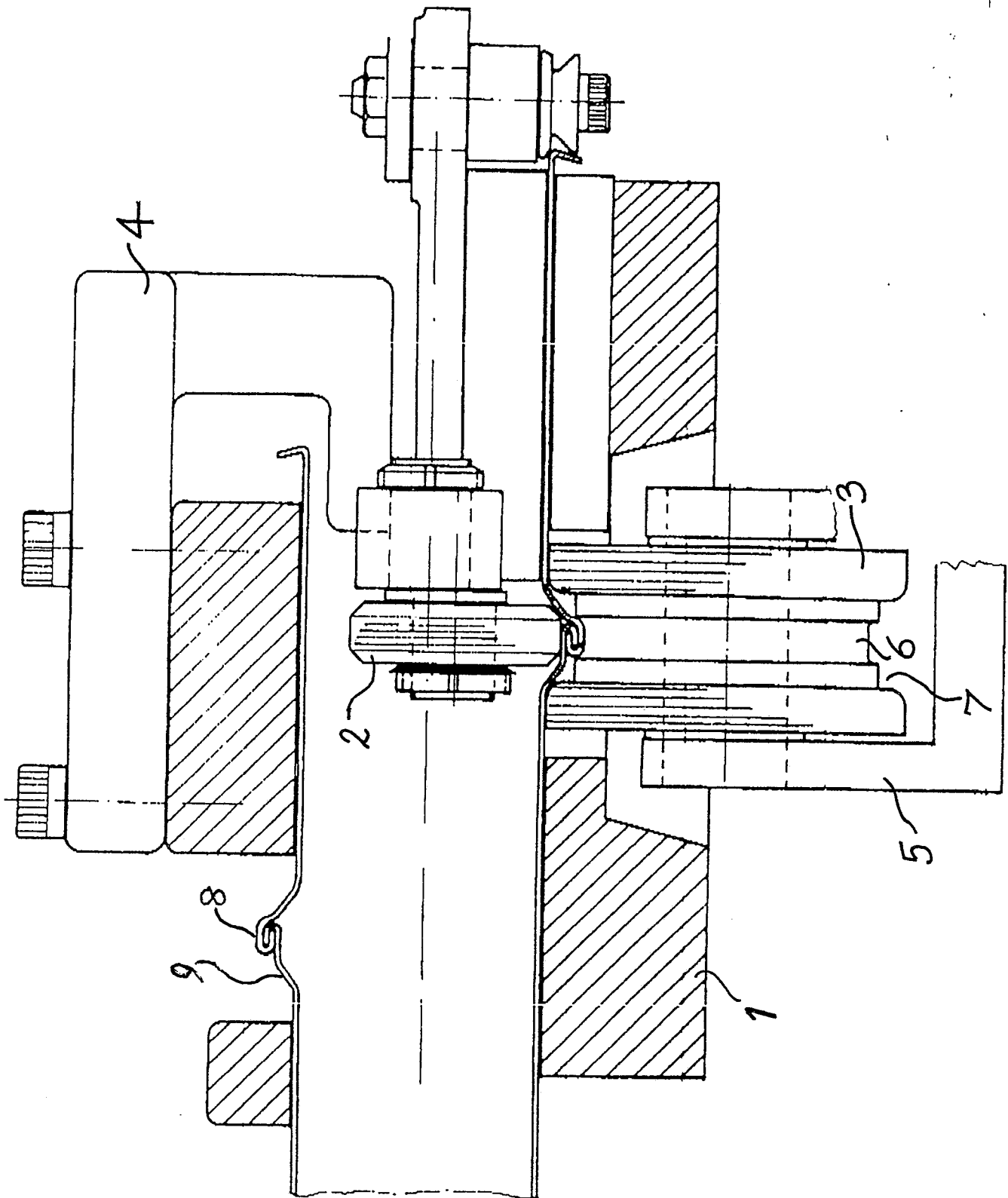
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	DE-C- 57 341 (ZIMMERMANN) * Whole document *	1-6	B 21 C 37/12
A	GB-A-1 599 379 (SPIRO INVESTMENT) * Whole document *	1-6	
P,A	EP-A-0 273 312 (PACIFIC ROLLER DIE CO.) * Abstract; figures 1,2 *	1-6	
			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			B 21 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-08-1989	Examiner THE K.H.
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