

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO SWAGING DIES

(71) We, CCL SYSTEMS LIMITED, of Cabco House, 296—304 Ewell Road, Surbiton, Surrey, a British company, do hereby declare the invention, for which we pray
 5 that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—
 This invention relates to swaging dies for
 10 use in a press for swaging a metal sleeve on to a concrete reinforcing bar or wire rope.
 According to the invention, there is provided for use in a press for swaging a sleeve
 15 on to a concrete reinforcing bar or wire rope, swaging dies comprising a pair of opposed co-acting high strength metal members each provided with a longitudinally extending recess having a ribbed portion upon
 20 which at least two longitudinally extending ribs are upstanding, the ribs being positioned such that when the two metal members are in contact the ribs are equally spaced one from another around the conjoined recesses.
 Each ribbed portion is preferably generally
 25 semi-cylindrical, and may contain two, three or four ribs. The lands between the ribs may be generally arcuate in cross-section. Preferably a semi-frusto-conical portion is
 30 provided at each end of the ribbed portion in the recess, opening outwardly into a semi-cylindrical portion, the outermost edge of which is chamfered.
 The bars or ropes to be joined may have plain or ribbed surfaces. The sleeve is pressed
 35 on to the bars or ropes in a single pressing operation, thus avoiding the two successive pressing operations in two mutually perpendicular directions necessary with some known swaging dies. The ribs on the dies
 40 cause indentations in the swaged sleeve, ensuring an efficient distribution of metal during the swaging operation.
 The swaging dies in accordance with the invention may be used in any suitable swaging
 45 press, but are especially effective when used in a press according to our co-pending Application No. 32600/75 (Serial No. 1,526,221).

An embodiment of the invention is illus-

trated in the accompanying diagrammatic 50 drawings, in which:

Figure 1 is an end elevation of a pair of co-acting swaging dies;

Figure 2 is a longitudinal sectional view 55 of the dies of Figure 1;

Figure 3 is a perspective view showing a sleeve to be swaged to bars by the dies of Figures 1 and 2; and

Figure 4 is a perspective view corresponding to Figure 3, but showing the swaged 60 joint.

Swaging dies 21 comprise a pair of opposed high strength metal die parts 22 each securable in a press, for example such as that described and illustrated in our co- 65 pending Application No. 32600/75 (Serial No. 1,526,221 previously referred to. Each die part has a recess 23 (Figure 2) comprising a substantially central semi-cylindrical portion 24 which communicates at each end 70 with a semi-frusto-conical portion 25, opening into a further semi-cylindrical portion, the extreme end of which, at the side of the die part, is chamfered as at 26.

A die half 27 is constituted by the inner 75 surface of the portion 24 of each die part. Each die half has four ribs 28 spaced equidistantly apart, so that the total die is of octagonal shape. The lands 29 between adjacent ribs 28 are generally arcuate in cross- 80 section, as shown.

The die parts are located in a press, preferably according to the said co-pending Application. As shown in Figure 2, screw 85 holes 30 are provided in the die parts for connecting the die parts to such a press.

Figures 3 and 4 show the press being used to splice two reinforcing bars 31 by means 90 of a splice tube 32. One bar 31 is placed in one end of the tube and then the two parts are swaged together in the press. The second bar is then located in the other end portion of the tube. The connection is made by swaging along the length of the splice tube in successive bites. In each case the metal of the 95 splice is deformed into tight engagement with the bar, with little or no elongation of the splice. As a consequence the number of bites

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necessary to secure a splice to the bars can be reduced to a minimum. The lands 29 between the ribs caused the formation of ribs 33 in the formed connection. In an evaluation a mean tensile strength in excess of that required was achieved with little significant difference between maximum and minimum values.

10 WHAT WE CLAIM IS:—

1. Swaging dies for use in a press for swaging a sleeve on to a concrete reinforcing bar or wire rope, comprising a pair of
15 opposed co-acting high strength metal members each provided with a longitudinally extending recess having a ribbed portion in which at least two longitudinally extending ribs are upstanding, the ribs being positioned
20 such that when the two metal members are in contact the ribs are equally spaced one from another around the conjoined recesses.

2. Swaging dies according to Claim 1, in which each ribbed portion is generally semi-cylindrical.

3. Swaging dies according to Claim 1 or 2, in which three ribs are provided on each ribbed portion.

4. Swaging dies according to Claim 1 or 2, in which four ribs are provided on each
30 ribbed portion.

5. Swaging dies according to any preceding claim, in which the lands between each pair of adjacent ribs are generally arcuate in cross section.

6. Swaging dies according to any preceding claim, in which each recess has a semi-frusto-conical portion at either side of the ribbed portion and opening outwardly
35 thereof.

7. Swaging dies according to Claim 6, in which each semi-frusto-conical portion opens into a semi-cylindrical portion, the outermost edge of which is chamfered.

8. Swaging dies for use in swaging a
40 sleeve on to a concrete reinforcing bar or wire rope, substantially as described with reference to the accompanying drawings.

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6. Swaging dies according to any preceding claim, in which each recess has a semi-frusto-conical portion at either side of the ribbed portion and opening outwardly thereof. 40

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