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(54) **Drawing die for drawing iron and steel rods**

(57) The present invention relates to a drawing die (1) for drawing iron and steel rods having a comparatively large diameter, which comprises a framework body (2), defining a throughgoing opening, housing an upper inlet element (5) and a drawing core (20), which are axially aligned.

The main feature of the invention is that the die (1) further comprises a lower outlet element (30), which can be removably coupled to the framework body (2) and axially engaged with the drawing core (20).

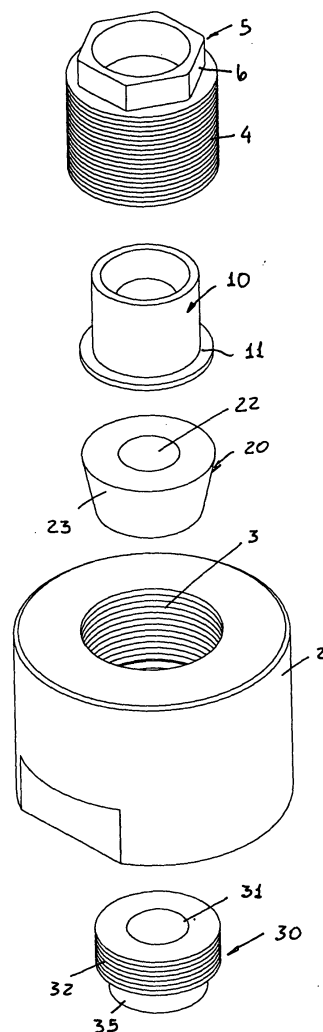


FIG. 1

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a drawing die for drawing iron and steel rods, having a comparatively large diameter.

[0002] As is known, in drawing processes, the iron or steel rod is subjected to a plastic deformation operation, to reduce its diameter to a set size.

[0003] Prior Italian patents IT 1,295,286 and IT 1,295,287 in the name of the same Applicant disclose an improved drawing die, including a drawing core, which can be easily replaced as it is worn by a different size core: said drawing core, in particular, can also be replaced with another similar drawing core for mating it with changing working conditions.

[0004] While this solution has been found as satisfactory for a lot of applications, it has also been found that it would be suitable only for a comparatively small diameter of the rods being drawn.

[0005] Actually, for larger diameters, the drawing core is subjected to excessively high drawing stresses, which cannot be properly compensated for by the framework body, with a consequent possibility of failures.

[0006] Moreover, the use of drawing cores having large diameters, would involve seizure conditions which would render very difficult the replacement of the drawing core.

SUMMARY OF THE INVENTION

[0007] Accordingly, the aim of the present invention is to overcome the above mentioned problems, by providing a drawing die for drawing iron and steel rods having a comparatively large diameter, allowing to properly compensate for the stresses or efforts applied to the drawing core, so as to optimally distribute said efforts, without damaging the die.

[0008] Within the scope of the above mentioned aim, a main object of the present invention is to provide such a drawing die, allowing to easily and quickly replace the drawing core, without generating undesired seizure conditions.

[0009] Another object of the present invention is to provide such a drawing die which, owing to its specifically designed features and constructions, is very reliable and safe in operation.

[0010] Yet another object of the present invention is to provide a drawing die for drawing iron and steel rods, having a comparatively large diameter, which can be easily made from easily commercially available elements and materials and which, moreover, is very competitive from a mere economic standpoint.

[0011] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a drawing die for drawing

iron and steel rods of a comparatively large diameter, said drawing die comprising a framework body defining a throughgoing opening housing herein an upper inlet element and a drawing core, said upper inlet element and drawing core being axially aligned with respect to one another, characterized in that said drawing die comprises moreover a lower outlet element which can be removably coupled to said framework body and axially engaged with said drawing core.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment of a drawing die for drawing iron and steel rods having a comparatively large diameter, and being illustrated, by way of an indicative, but not limitative, example in the accompanying drawings, where:

Figure 1 is an exploded perspective view illustrating the drawing die according to the invention;

Figure 2 is a further exploded view, in a diametral cross-section, of the drawing die;

Figure 3 shows the drawing die and core as cross-sectioned;

and

Figure 4 is a cross sectional view showing the drawing die in an assembled condition thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] With reference to the number references of the above mentioned figures, the drawing die for drawing iron and steel rods of a comparatively large diameter, according to the present invention, which has been generally indicated by the reference number 1, comprises a framework body 2, which defines in its inside a throughgoing opening which, at the top or upper portion thereof, is provided with a female thread 3, in which can be engaged a male thread 4 of an upper inlet element 5, which is provided with an outer polygonal portion 6 to be engaged by a wrench.

[0014] In said upper inlet element, a drawing die, generally indicated by the reference number 10, and including a drawing die flange 11, can be housed.

[0015] Said drawing die, in particular, is axially engaged with the lower end portion of the upper or top inlet element, thereby providing a lead-in feature for the introduction of the rod.

[0016] In an axially aligned relationship, is moreover provided a drawing core 20, having a frustum-of-cone shaped inner bore 22, and comprising, on the outside thereof, with a frustum-of-cone shaped tapering portion 23, engaging with a corresponding tapering recess 24, formed on said throughgoing opening defined by the

framework or supporting body 2.

[0017] The main feature of the invention is that a lower or bottom outlet element, generally indicated by the reference number 30, is moreover provided, which comprises an outlet hole 31 axially aligned with said bore or hole 22 of the drawing core, and including moreover a threaded enlarged portion having a male thread 32 engaging with a recess 33 including a female thread, thereby allowing a removable engagement with the framework body 2 to be easily made.

[0018] The bottom or lower outlet element is axially engaged with the drawing core, thereby cooperating with the latter to resist against axially directed efforts applied by the rods being drawn.

[0019] With the above disclosed arrangement, the efforts or stresses generated during the drawing operation are compensated for over a comparatively broad region, defined by the male thread portion of the lower element, thereby the die can resist against very high pushing forces.

[0020] From the above disclosure it should be apparent that the invention fully achieves the intended aim and objects.

[0021] In particular, it is to be pointed out that the provision of the lower outlet element, facilitating the outward movement of the drawn rod, further allows to easily replace the drawing core, since the latter is safely prevented from being forced and seized.

[0022] For disassembling the above disclosed bottom outlet element, the polygonal end piece 35 could be easily engaged by a suitably designed disassembling tool.

[0023] The invention, as disclosed, is susceptible to several modifications and variations, all of which will come within the scope of the invention.

[0024] Moreover, all the constructional details can be replaced by other technically equivalent elements.

[0025] In practicing the invention, the used materials, as well as the contingent size and shapes, can be any, depending on requirements.

3. A die, according to the preceding claims, **characterized in that** said drawing core has an outer tapering shape, to be engaged with a corresponding tapering recess defined in said throughgoing opening.

4. A die, according to one or more of the preceding claims, **characterized in that** said lower outlet element comprises an enlarged portion having a male thread to be removably engaged with a corresponding recess having a female thread, defined by said framework or supporting body.

5. A die, according to one or more of the preceding claims, **characterized in that** said lower outlet element defines, at the bottom end portion thereof, a polygonal end piece to be engaged by a disassembling tool.

6. A die, according to one or more of the preceding claims, **characterized in that** said bottom outlet element comprises an outlet hole having a diameter larger than that of the outlet hole of said drawing core.

7. A drawing die for drawing iron and steel rods having a comparatively large diameter, according to one or more of the preceding claims, and substantially as broadly disclosed and illustrated and for the intended aim and objects.

Claims

1. A drawing die for drawing iron and steel rods of a comparatively large diameter, said drawing die comprising a framework body defining a throughgoing opening housing herein an upper inlet element and a drawing core, said upper inlet element and drawing core being axially aligned with respect to one another, **characterized in that** said drawing die comprises moreover a lower outlets element which can be removably coupled to said framework body and axially engaged with said drawing core.
2. A die, according to the preceding claim, **characterized in that** said die comprises a drawing die member housed inside said upper inlet element.

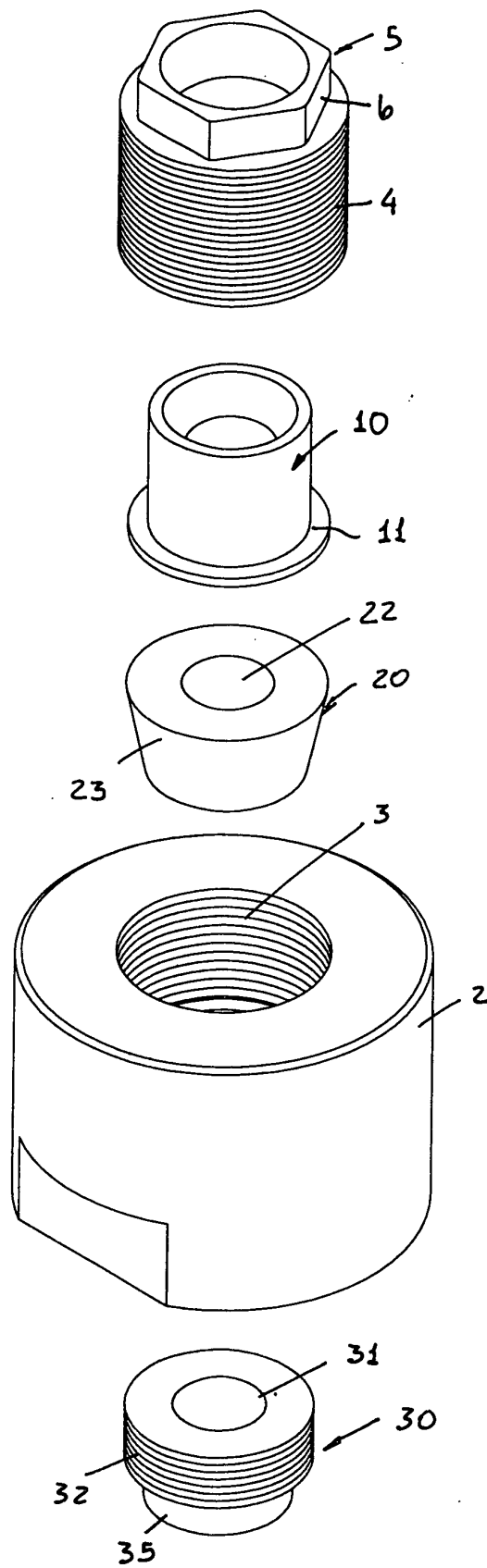


FIG. 1

