

[54] **HYDRAULIC SECTION-STRETCHING MACHINE**

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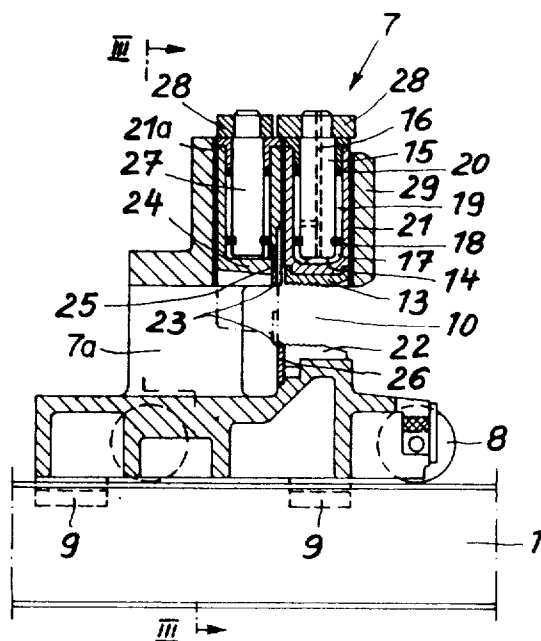
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[57] **ABSTRACT**

A hydraulic section-stretching machine, having a cylinder and piston co-operating with a stretching grip, a longitudinally movable but arrestable counter-grip having clamping jaws operative perpendicularly to the section-stretching axis, the counter-grip being provided with two C-shaped apertures in the same plane, perpendicular to one another, one facing the stretching grip to accommodate the section to be stretched, and the other facing the stretched material to be transported, and a severing means close to the clamping jaws, acting in a vertical plane perpendicular to the stretching axis.

4 Claims, 4 Drawing Figures



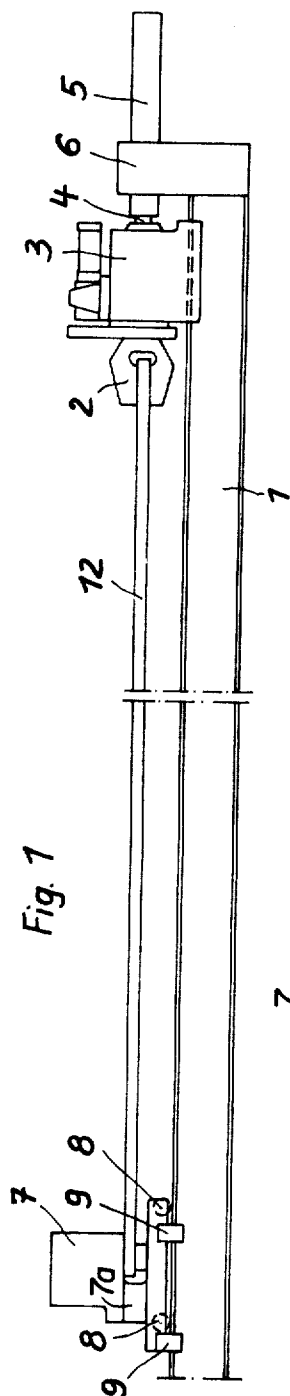


Fig. 1

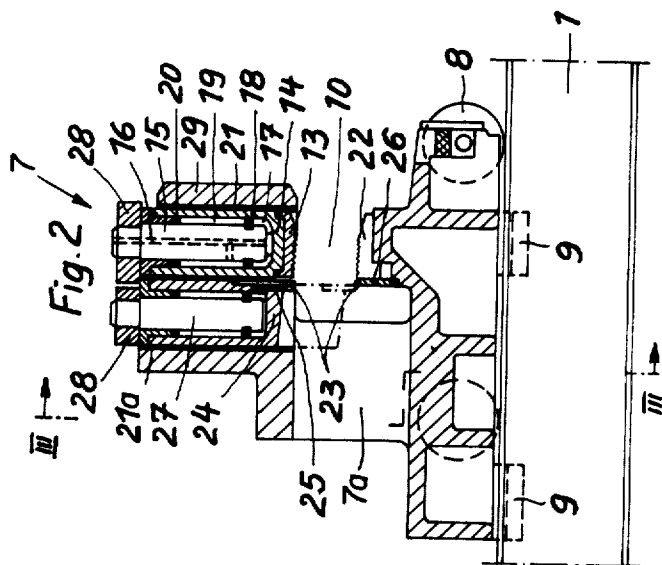


Fig. 2

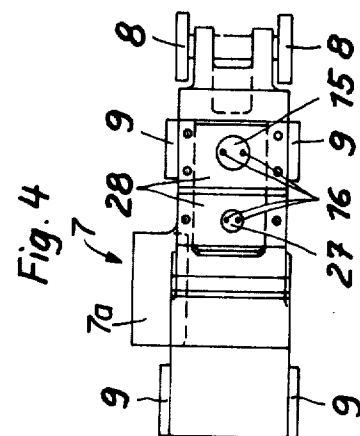


Fig. 3

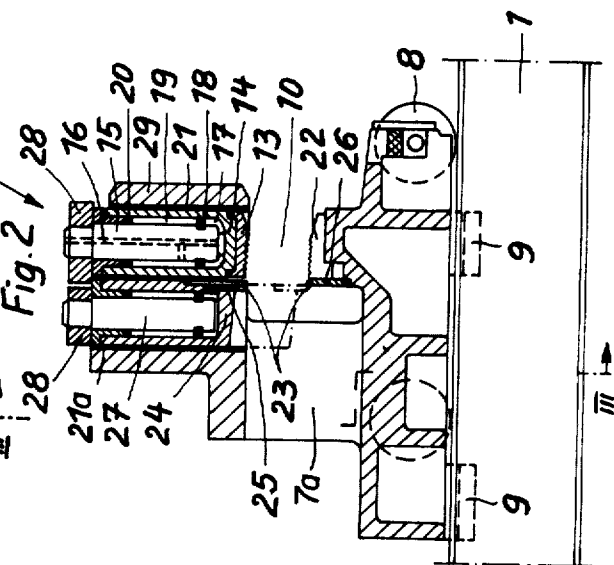


Fig. 4

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HYDRAULIC SECTION-STRETCHING MACHINE

BACKGROUND OF THE INVENTION

This invention relates to a hydraulic section-stretching machine provided with a cylinder and piston co-operating with a stretching grip, and with a longitudinally movable counter-grip capable of being arrested, with the gripping jaws of the counter-grip being operative perpendicularly to the section-stretching axis.

PRIOR ART

It is known, for the racking of sections, to adjust the counter-grip to the particular length of a section, an arresting of the counter-grip upon its underlying support or base-plate being possible, in general, only at definite distances from the stretching grip. Under these circumstances, the uncontrollable differences in length between the sections to be stretched must be taken up by a stroke of the racking piston which is correspondingly increased beyond the normal racking stroke. There is also known a continuous or stepless adjusting and arresting of the counter-grip to the corresponding length of section. In consequence of the differences in length between the sections coming from a metal-extrusion press, the counter-grip must be adjusted to the corresponding length of section for each racking operation.

Even in the case of a two-strand extrusion of sections on metal-extrusion presses, it may happen, for example, that one strand may be as much as 2 meters longer than the other. This involves, at times, a renewed shifting of the counter-grip, and therefore a loss of time. This also applies to sections that have been pressed from metal billets of different initial weights.

SUMMARY OF THE INVENTION

The object of the present invention is to construct a section-stretching machine in such a way that the sections accruing from one size of billet, when extruded through the same die, but partly with different lengths, can be racked, and, if need be, untwisted without displacing the counter-grip. The sections can then be transported to the section-stretching machine, racked and removed from the machine on a live-roller delivery table, in the same direction as the feed, perpendicularly to the stretching axis.

According to the invention, this aim is attained by providing a thrust beam, a stretching grip fixedly mounted on the thrust beam, a cylinder and piston mounted on the thrust beam and cooperating with the stretching grip, a counter-grip longitudinally movable along the thrust beam, the counter-grip and stretching grip defining a stretching axis and cooperating to grip a section to be stretched, and the counter-grip comprising means for arresting the movement of the counter-grip along the thrust beam, a C-shaped support constituted by a vertical portion and upper and lower horizontal portions, a clamping jaw carried by each of the horizontal portions, the horizontal portions and clamping jaws providing a first aperture which is open towards the stretching grip and a second aperture in the same plane but facing at right angles thereto towards the stretched section to be transported, one of the clamping jaws being movable perpendicularly to the stretching axis of a section secured by one end to the stretching grip and clamped towards the other end by the counter-grip, the vertical portion of the C-shaped support being located entirely to one side of the stretching axis, and severing means immediately adjacent to the clamping jaws of the counter-grip, acting in a vertical plane perpendicular to the direction of the stretching axis, with the vertical portion of the C-shaped support being located entirely on that side of the severing means distant from the stretching grip, so that any part of the section which projects outwards beyond the clamping jaws can be severed close beside the clamping jaws by the severing means.

In a further development of the invention, a shearing device with upper and lower blades is provided on the counter-grip as a severing means, and the upper edge of the lower blade and the upper edge of the lower clamping jaw are arranged stationarily at the same level on the counter-grip.

Advantageously, the upper clamping jaw is secured to a clamping cylinder and the upper shear blade is secured to a shearing cylinder which is movable on the counter-grip, the shearing cylinder being slidably guided on the clamping cylinder.

The invention makes it possible to clamp and stretch material of different lengths without loss of time, the pieces of the stretch material that project beyond the severing means being severed either at the time of stretching or immediately thereafter. An advantage here resides in the fact that the upper clamping jaw carries out two functions at the same time, namely first it clamps the stretch material, and secondly, during or after the stretching operation, it serves as a holding-down means for the material to be severed immediately beside it.

The racked stretch material provided in this way in a unitary length can be transported away from the stretching machine without further loss of time without change of direction from the direction of supply to the stretching machine, perpendicularly to the stretching axis, upon a live-roller delivery table.

From an economic point of view, the loss of the severed ends of the casting or section is not so serious as the loss of time which would be involved by the counter-grip being adjusted every time to the appropriate length of the material.

One embodiment of the invention is further explained by way of example with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side view of a section-stretching machine with stretching grip and counter-grip, in which an untwisting means is also provided on the stretching grip;

FIG. 2 shows on a larger scale a longitudinal section through the counter-grip in an axial direction;

FIG. 3 is a view taken along line III—III in FIG. 2, the view looking in the direction of the arrows; and

FIG. 4 is a plan view of the counter-grip.

DETAILED DESCRIPTION OF THE DRAWINGS

In a section-stretching machine as shown in FIG. 1, a thrust beam constructed as a frame 1 of the nature of a joist or double-T girder, which, on the basis of the design, takes up the bending moments arising in the machine during the stretching operation, carries a stretching grip 2, which, coupled to an untwisting means 3 for the sections, co-operates by way of a stretching piston 4, with a stretching cylinder 5. The stretching cylinder 5 is fixedly connected with the frame 1 by way of a bracket 6. The stretching grip 2 slides, with the casing of the untwisting means 3, along the frame 1. Further, there is, upon the frame 1, a counter-grip denoted generally 7, axially displaceable along the frame, on wheels 8, and arrestable on the frame 1 by clamping means 9.

The counter-grip 7 includes a C-shaped support or yoke constituted by a vertical portion 7a and upper and lower horizontal portions 7b and 7c providing a first aperture 10 which is open towards the stretching grip 2 and a second aperture 11 which faces towards stretch material 12 to be transported. An upper clamping jaw 13 is mounted in the horizontal portion 7b of the support and is fixedly connected with a clamping cylinder 14, which, by means of a pressure medium, co-operates with a clamping piston 15 fixedly arranged in the counter-grip 7. By way of bores 16 in the clamping piston 15, the pressure medium can firstly be passed into cylinder space 17, which is separated from cylinder space 19 by packings 18 arranged on the clamping piston 15. The clamping cylinder 14 is thereby pressed downwards. By admitting pressure medium through the bores 16 into the cylinder space 19, which is bounded upwards by packings 20 secured to the clamping cylinder 14, and downwards by the packings 18 arranged on the clamping piston 15, the clamping cylinder 14 is moved upwards, with the upper clamping jaw 13. This clamping cylinder 14 slides in guides 21 provided in the counter-grip 7. The clamping of the stretch material 12 is effected by the upper jaw 13 against a lower clamping jaw 22 fixedly supported on the horizontal portion 7c of the C-shaped support.

Immediately adjacent to the clamping cylinder 14, there is arranged in the upper part of the counter-grip 7 a shearing device 23, which consists of an upper blade 25 secured to a shearing cylinder 24 and a lower blade 26 fixedly arranged on the lower clamping jaw 22. The shearing cylinder 24 co-operates, in the same manner as the clamping cylinder 14, with a shearing piston 27 fixedly arranged in the upper part of the counter-grip 7, and is guided in guides 21a on the clamping cylinder 14 just as the latter is guided in guides 21 in the counter-grip 7. The clamping cylinder 14 and the shearing cylinder 24 are externally of rectangular construction, and their adjacent walls are in sliding contact. In this way, a twisting of the cylinders is prevented, and a reliable guidance of the upper clamping jaw 13 and the upper blade 25 on the one hand against the lower clamping jaw 22 and the lower blade 26 on the other hand is ensured. The clamping piston 15 and the shearing piston 27 are connected, by way of plates 28, with the upper part of the counter-grip 7. By means of a thrust plate 29, the clamping cylinder 14 and the shearing cylinder 24 are adjustable in their guides 21.

The method of working of the combination of clamping means and shearing means in the counter-grip 7 is such that immediately after the clamping and during or after the stretching of the stretch material 12, the part of the stretch material 12 that projects outwards beyond the clamping jaws 13 and 22 since the vertical portion 7a is located entirely to one side of the stretching axis, such projecting material can be severed close beside the clamping jaws by means of the upper and lower blades 25 and 26. In this way, stretch material of different lengths can be economically racked without time-wasting adjustment of the stretching grip, and can be carried away in unit lengths transversely to the stretching machine in the same direction as the advancing.

I claim:

1. A hydraulic section-stretching machine, comprising: a thrust beam, a stretching grip fixedly mounted on the thrust beam, a cylinder and piston mounted on the thrust beam and cooperating with the stretching grip, a counter-grip longitudinally movable along the thrust beam coacting with the stretching grip to grip a section to be stretched, the counter-grip and stretching grip defining a stretching axis, and the counter-grip comprising means for arresting the movement of

the counter-grip along the thrust beam, a C-shaped support constituted by a vertical portion and upper and lower horizontal portions, a clamping jaw mounted in the upper horizontal portion, a clamping jaw mounted in the lower horizontal portion, said horizontal portions and clamping jaws providing a first aperture which is open towards the stretching grip to accommodate the section to be stretched and a second aperture in the same plane but facing at right angles thereto towards the stretched section to be transported, one of the clamping jaws being movable perpendicularly to the stretching axis of a section secured by one end to the stretching grip and clamped towards the other end by the counter-grip, the vertical portion of the C-shaped support being located entirely to one side of the stretching axis, and severing means immediately adjacent to the clamping jaws of the counter-grip, acting in a vertical plane perpendicular to the direction of the stretching axis, with the vertical portion of the C-shaped support being located entirely on that side of the severing means distant from the stretching grip so that any part of the section projecting outwards beyond the clamping jaws can be severed close beside the clamping jaws by the severing means.

2. The hydraulic section-straightening machine as claimed in claim 1, in which the severing means is a shearing device comprising upper and lower shear blades, the upper edge of the lower shear blade being stationarily arranged on the lower horizontal portion of the C-shaped support at the same level as the upper edge of the clamping jaw mounted on the lower horizontal portion.

3. The hydraulic section-straightening machine as claimed in claim 2, further comprising: a clamping cylinder having a wall and a shearing cylinder having a wall of complementary shape to said clamping cylinder wall mounted on the counter-grip, said walls being in slidable contact, the clamping jaw mounted in the upper horizontal portion being secured in fixed relation to this clamping cylinder and the upper shear blade in fixed relation to the said shearing cylinder, the counter-grip being provided with guides parallel to said walls for guiding the shearing cylinder and the clamping cylinder at locations opposite their respective said complementary walls.

4. The hydraulic section-stretching machine as claimed in claim 1, in which the severing means is on that side of the clamping jaws distant from the stretching grip.

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