

Oct. 22, 1963

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3,107,716

GRIPPING HEADS FOR SHEET-STRETCHING MACHINES

Filed Nov. 4, 1960

FIG. 1

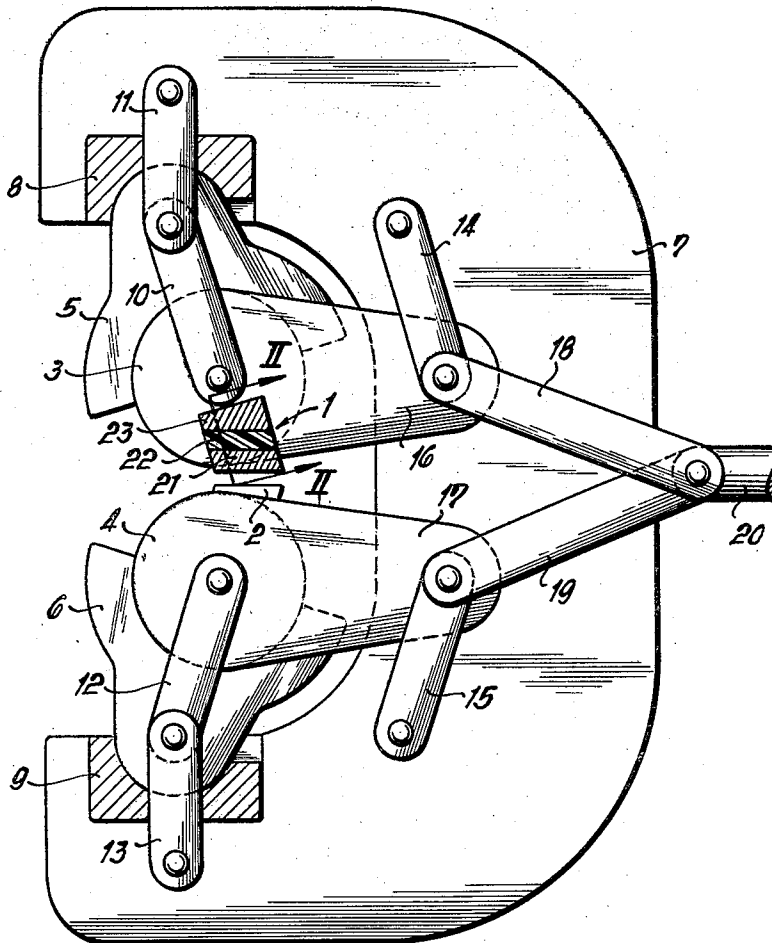
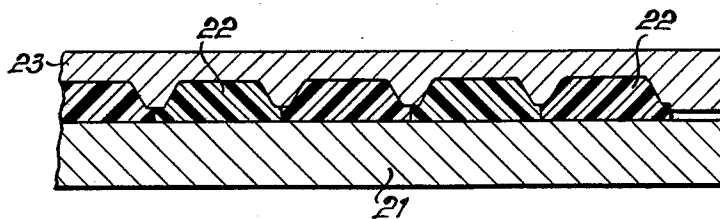


FIG. 2



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GRIPPING HEADS FOR SHEET-STRETCHING MACHINES

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Filed Nov. 4, 1960, Ser. No. 67,238

Claims priority, application Germany Nov. 23, 1959

6 Claims. (Cl. 153—35)

This invention relates to a gripping head for a sheet-stretching machine, with two clamping jaws extending over the breadth of the widest sheet to be stretched.

The object of the invention is to provide satisfactory clamping even of thin sheets, by obviating linear pressure upon the sheet, because linear pressure injures the sheet, and in particular may disconnect thin sheets. The gripping head should moreover be small and should not include parts that are difficult to machine. The invention also seeks to attain a large clamping-jaw opening.

The invention consists in the feature that each clamping jaw is pivotally movable on the gripping-jaw frame by means of parallelogram guides. The invention is illustrated by way of example in the accompanying drawings, in which:

FIGURE 1 shows a gripping head in side elevation, partly in section; and

FIGURE 2 shows on a larger scale a longitudinal section through the upper clamping jaw, on the line II—II in FIGURE 1.

By 1 is denoted the upper clamping jaw of a gripping head, and by 2 the lower clamping jaw. The clamping jaws are inserted in clamping-jaw carriers 3 and 4 respectively. The clamping-jaw carriers 3 and 4 are constructed as shafts, and are rotatably supported in an upper clamping beam 5 and a lower clamping beam 6. The gripping-head frame 7 rotatably accommodates the clamping beams 5 and 6 in bearings 8 and 9.

The upper clamping-jaw carrier 3 is suspended, through the medium of an outer supporting shackle 10, by means of a carrying shackle 11, in the upper part of the gripping head. The lower clamping-jaw carrier 4 is correspondingly held, through the medium of an outer supporting shackle 12, by means of a carrying shackle 13, in the lower part of the gripping-head frame 7. A further shackle in each case, namely an upper inner supporting shackle 14 and a lower inner supporting shackle 15, are pivoted at one end to the gripping-head frame 7, and at the other end to an intermediate shackle 16 or 17 respectively, parallel to a sheet to be clamped. To the inner supporting shackles 14 and 15 are attached pulling shackles 18 and 19, which are together pivoted to a rod 20, which can be pushed to and fro by known means, for instance by a hydraulically actuated piston. The intermediate shackles 16 and 17 connect the clamping-jaw carriers 3 and 4 with the supporting shackles 14 and 15 respectively.

FIGURE 2 shows the special construction of the upper clamping jaw 1. It would obviously be possible to construct the lower clamping jaw in this manner instead. By 21 is here denoted the clamping-jaw rule or arm, extending over the maximum breadth of sheet. Upon it are arched a row of individual resilient pads 22, which are made of synthetic material or india rubber. The pads 22 are let into a pad bed 23. The pad bed 23 is divided into chambers by ribs, so as to throttle, as in a labyrinth pack-

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ing, the propagation of the pressure. This action is desirable when the breadth of the sheet to be stretched is less than that of the clamping jaws. The clamping jaws, with their clamping-jaw carriers, and also the clamping beams, extend over the breadth of the largest sheet to be stretched. The upper supporting shackles 10 and 14, with the intermediate shackle 16, the carrying shackle 11 and the pulling shackle 18 on the one hand, and the lower supporting shackles 12 and 15, with the intermediate shackle 17, the carrying shackle 13 and the pulling shackle 19 on the other hand, are mounted on both sides of the gripping-head frame 7. The actual parallelogram guide consists of the equally long supporting shackles 10 and 14, or 12 and 15, and the intermediate shackle 16 or 17. It results in the clamping jaws always approaching one another parallel, and engaging the sheet to be stretched with flat surface pressure.

What I claim is:

1. A gripping head for a sheet-metal stretching machine, comprising: a gripping-head frame, two clamping beams rockably journaled in the gripping-head frame, two clamping-jaw carriers each rockably journaled in one of the clamping beams, two clamping jaws, each carried by one of the clamping-jaw carriers, and each extending over the entire breadth of the widest sheet to be stretched, two inner supporting shackles, each pivotally mounted by one end on the gripping-head frame, two intermediate shackles, each pivotally connected by one end with the free end of one of the inner supporting shackles and by the other end with an associated clamping-jaw carrier at its axis, the length and inclination of each inner supporting shackle between its pivotal points being equal to the length and inclination of the distance between the axes of the bearings of its associated clamping-jaw carrier in the clamping beam and of the clamping beam in the gripping head, so as to form a parallelogram guide for the associated clamping-jaw, and means for swinging the parallelogram guides so as to grip the sheet firmly between the clamping-jaws and to release it when required.

2. A gripping head as claimed in claim 1, further comprising two outer supporting shackles, each connecting one of the clamping beams, at the axis about which it rocks in the gripping head, with the associated clamping-jaw carrier, at the axis about which it rocks in the clamping beam, so as to maintain the clamping-jaw carrier in bearing contact with the clamping beam when the gripping head is being released.

3. A gripping head as claimed in claim 1, further comprising two carrying shackles, each pivotally mounted by one end on the gripping head, and connected by its other end with one of the clamping beams, so as to maintain the clamping beam in bearing contact with the gripping head when the gripping head is being released.

4. A gripping head as claimed in claim 1, each of the clamping-jaw carriers journaled in one of the clamping beams being constructed as a shaft.

5. A gripping head as claimed in claim 1, further comprising: the means for swinging the parallelogram guides to and fro, and thereby tightening and releasing the grip of the clamping jaws on the sheet to be stretched, including: a common pushing and pulling member, and pushing and pulling shackles each pivoted by one end to one of the intermediate shackles and by the other end to the common pushing and pulling member.

6. A gripping head as claimed in claim 1, at least one of the clamping jaws comprising: a clamping-jaw rule which comes into contact with the sheet to be stretched throughout its length, a pad bed of the same length behind the clamping-jaw rule, and a continuous row of individual resilient pads interposed between the clamping-jaw rule and the pad bed.

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