

[54] **JAW ASSEMBLY FOR BOLT CUTTING DEVICES**

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[58] **Field of Search**..... 30/193, 194, 266, 267, 30/268, 269, 270

[56] **References Cited**

UNITED STATES PATENTS

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FOREIGN PATENTS OR APPLICATIONS

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[57]

ABSTRACT

A bolt cutting device having a pair of pivotally connected jaws and handle-arms for mutually rotating the jaws, said jaws having cutting edges arranged to move toward and away from each other but not beyond each other, and having cutting edges positioned in one and the same plane of rotation, in which said jaws are pivotally mounted about a common pivot bolt, each jaw on its respective side of the jaw pair in the region of the pivot bolt having a support flange overlapping the adjacent jaw; in that the overlapping region of the jaws formed by their support flanges around the pivot bolt has a radially inner contact surface for forming a coacting pair of radially inner guide surfaces and two outer contact surfaces which are located at substantially equal radial distances from the pivot bolt, said two outer contact surfaces being arranged to coact pairwise with the outer contact surfaces on the opposing jaw within the limits of the mutual pivoting movement of the jaws, thereby to form two pairs of radially outer guide surfaces; in that the three pairs of guide surfaces are located in three separate, parallel planes of rotation; in that the radial inner pair of guide surfaces is located in the intermediate plane of said three planes; and in that one of the radially outer contact surfaces on each jaw is located on the support flange and is depressed in relation to the radially inner contact surface.

4 Claims, 3 Drawing Figures

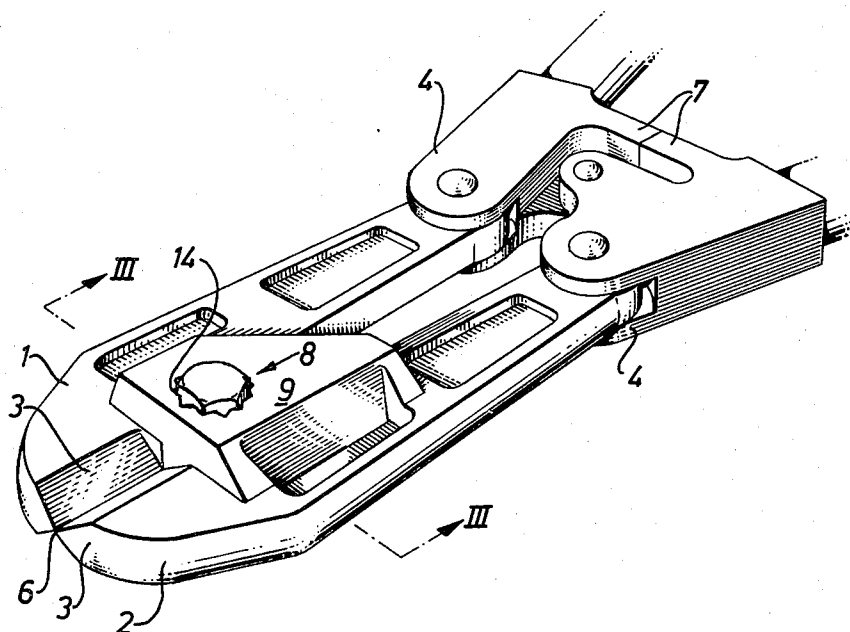


Fig. 1

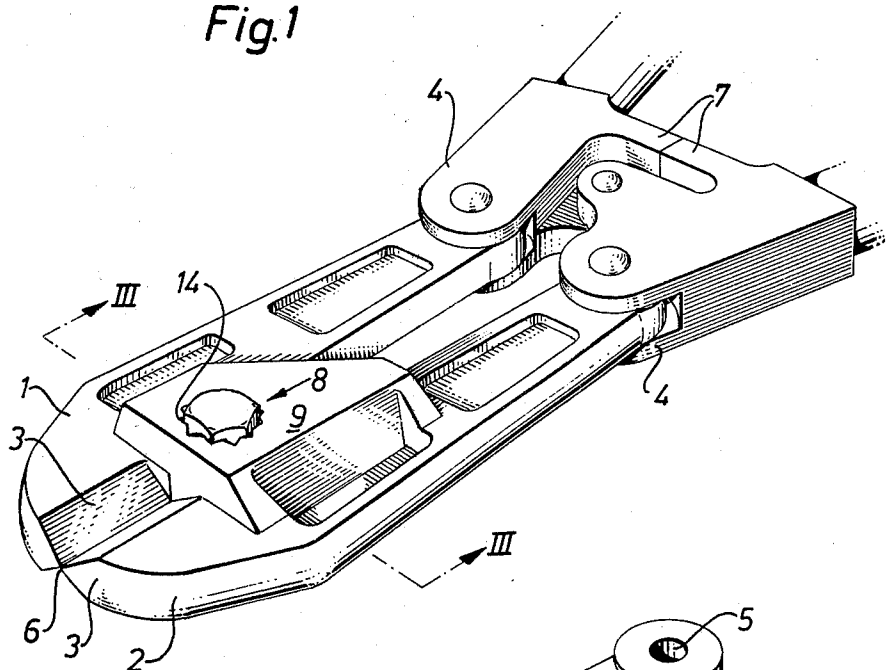


Fig. 2

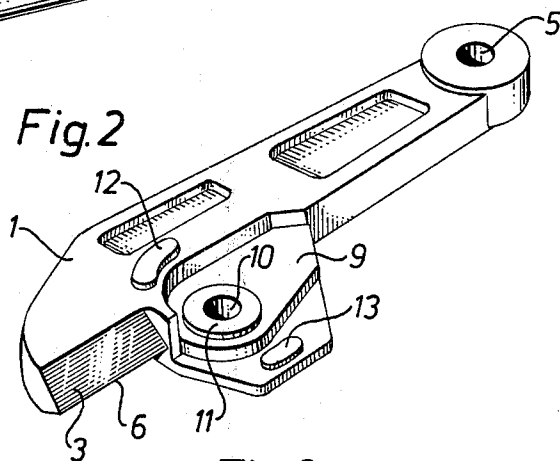
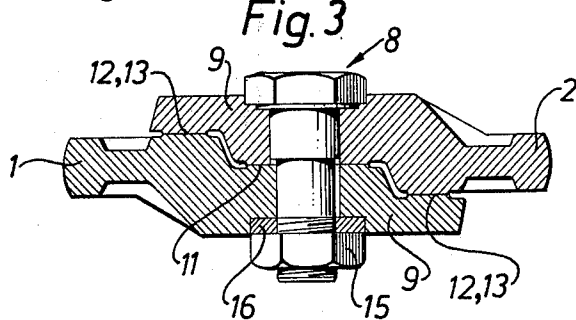


Fig. 3



JAW ASSEMBLY FOR BOLT CUTTING DEVICES

The present invention relates to a jaw assembly for bolt cutting devices, said assembly comprising two jaws which are adapted to be pivotally connected together and each of which has one end thereof adapted for pivotable connection to a respective jaw actuating device, such as a handle-arm, by means of which the jaws of the bolt cutting device can be mutually rotated, and the other ends of which jaws are provided with cutting means, which, upon rotation of the jaws, are arranged to move toward and away from each other but not beyond each other, and the cutting edge lines of which cutting means are positioned in one and the same plane of rotation.

Such a jaw assembly is common with bolt cutting devices, in which devices the operating force applied manually thereto is transmitted via two handle-arms which are connected together and which have the form of double-arm levers. Such a jaw assembly is also found with manual bolt-cutting devices with which said force is transmitted hydraulically, and also with motor-driven bolt cutting devices.

With the conventional jaw assembly, each of the jaws is mounted for rotation around its respective joining pivot pin. The two pivot pins are carried on a pair of cross-pieces, one piece on each flat side of the jaw pair. The jaws are also provided with movement synchronizing engaging means, normally in the form of teeth, on respective mutually opposing edges located between the pivot pins. The jaw actuating devices are normally adjustable, to permit the jaws to be adjusted to the correct position, i.e., so that there is obtained a clearance between the cutting edges of the cutting means in the end limit position of the closing movement of said actuating devices. An example of means which permit such adjustment is the adjustable yoke arranged on each handle-arm of a conventional manually operated bolt clipper. It is known from the Swedish Pat. No. 311,265 to provide each pivot pin with an eccentric, to permit mutual adjustment of the jaws so that the correct clearance is obtained between the cutting edges thereof.

Since the jaw assembly of this kind with the jaws mounted on their respective pivot pins comprises a relatively large number of components, such an assembly is relatively complicated when seen from the aspect of manufacture and assemblage.

An object of the present invention is to provide a simplified joint construction of the jaw assembly, without detracting from the high requirements placed on known cutting devices, such as for example a high degree of mechanical strength so as to be able to withstand the loads to which such devices are subjected when cutting and prizing.

This object is achieved by means of a jaw arrangement constructed in accordance with the invention, which is mainly characterized in that the jaws are pivotally mounted about a single, common pivot means, preferably a pivot bolt; in that each jaw on its respective side of the jaw pair in the region of the pivot means has a support flange which overlaps the adjacent jaw; in that the overlapping region of the jaws formed by their support flanges around the pivot means has on each jaw a radially inner contact surface for forming a co-acting pair of radially inner guide surfaces and two outer contact surfaces which are located at substantially equal radial distances from the pivot means, said two outer contact surfaces being arranged to co-act

pairwise with the outer contact surfaces on the opposing jaw within the limits of the mutual pivoting movement of the jaws, thereby to form two pairs of radially outer guide surfaces; in that the three pairs of guide surfaces are located in three separate, parallel planes of rotation; in that the radial inner pair of guide surfaces is located in the intermediate plane of said three planes; and in that on each jaw one of the radially outer contact surfaces is located on the support flange and is depressed in relation to the radially inner contact surface.

So that the invention will be more readily understood and further features thereof made apparent, an embodiment of the invention will now be described by way of example only with reference to the accompanying drawing, in which:

FIG. 1 is a perspective view of the jaw assembly in an assembled condition and mounted on the ends of the handle-arms of a manual bolt clipper, said handle-arms being only partially shown,

FIG. 2 is a perspective view of one of the jaws shown in FIG. 1,

FIG. 3 is a cross-sectional view through the assembled jaw arrangement of FIG. 1 taken through the lines III — III.

As will be seen from the drawing, each jaw 1, 2 is of integral construction and its front portion, i.e., the portion remote from the respective handle-arm, is provided with a cutting edge 3. The opposite end of the jaw is adapted to be pivotally connected to an actuating means 4, FIG. 1, such as the handlearms of a bolt clipper by means of which the two jaws are activated. The jaws are connected via a hole 5, as seen in FIG. 2. In the assembled condition of the jaws, the cutting edge lines 6 of the cutting edges 3 of said jaws are arranged to lie on one and the same plane of rotation when the jaws are mutually rotated. The illustrated jaws are provided with so-called centre-cut jaws. As is usual with bolt clippers, the cutting edges are adapted to be moved, upon mutual rotation of the jaws, toward and away from each other but not beyond each other, i.e., to execute a non-scissoring movement when cutting the workpiece, for example a bolt or a reinforcing rod. The jaws 1, 2 are provided with distance members 7 which restrict the cutting movement so that the ends 4 of the handle-arms, in which ends the jaws 1 and 2 are pivotally connected, have a pre-determined largest mutual distance corresponding to a position of rotation of the jaws in which the cutting edges 3 are practically closed together, apart from a small gap therebetween which is arranged to prevent damage to the cutting edges.

The jaws 1 and 2 are pivotally mounted about a single pivot means, which with the illustrated embodiment has the form of a pivot bolt 8, such as a hexagonal bolt. The use of a single, common pivot bolt for the two jaws is made possible by the fact that each jaw is provided with a support flange 9, which overlaps the opposing jaw to an extent such that a pivot portion is obtained within which a through-passing hole 10 arranged to accommodate the pivot bolt is provided in each jaw. The two jaws are of substantially identical construction with the support flanges identically located, so that a mutual overlapping is obtained when one of the jaws is turned. A planar, ring-shaped radially inner contact surface 11 is arranged around the hole 10 on each jaw to co-act with a corresponding contact surface on the opposing jaw when the jaws are in an assembled condition. In ad-

dition to this radially inner contact surface 11, each jaw has two radially outer contact surfaces 12 and 13 which are located at a substantially equal radial distance from the hole 10. The contact surface 12 is arranged on the body portion of the jaw while the contact surface 13 is located on the support flange 9. Similar to the radially inner contact surface 11, the two radially outer contact surfaces 12 and 13 are located on the inside of the jaw, i.e., the side which is adapted to face the opposing jaw when the jaws are assembled. In the assembled position of the jaws, the two radially inner contact surfaces 11 on the two jaws abut against each other around their annular seating. Further, the radially outer contact surfaces 12 and 13, which have a limited extension peripherally, are so situated that each surface 12 abuts the surface 13 on the opposing jaw in all mutual positions of rotation within the region of the intended movement between open and closed jaws. Thus, the inner contact surfaces form a pair of inner slide-guide surfaces 11, 11 and the outer contact surfaces form two pairs 12, 13 of outer slide-guide surfaces.

The three pairs of guide surfaces are located in three separate, parallel planes of rotation. The intermediate of these planes is defined by the co-acting radially inner contact surfaces 11. On each jaw the radially outer contact surface 12 located on the body portion of the jaw is arranged on a raised portion relative to the inner contact surface 11, while the other, outer contact surface 13 on the support flange 9 is sunk to a corresponding degree relative to the inner contact surface 11. The two pairs of slide-guide surfaces, each of which forms a contact surface 12 on one jaw and a contact surface 13 on the other jaw, are thus located in respective planes on both sides of the plane formed by the contact surfaces 11. The support flange 9 is relatively thin while the body portion of the jaw is relatively thick, thereby to provide a favourable distribution of material from a mechanical strength point of view and a construction which can be used smoothly and reliably.

It is important with respect to the function of the pivot pin that the contact surfaces 11, 12 and 13 on each jaw accurately fulfil the requirements of localization with respect to the three parallel planes. The contact surfaces are therefore located on support bosses on the jaws 1 and 2 which are normally forged, and, subsequent to an optional machining operation, the measurements of said surfaces are calibrated by hard embossing all of the three bosses simultaneously in a pressing operation.

The pivot bolt 8 is provided with an eccentric which is formed directly in the bolt shank. One of the jaws, 2, is provided with a 12-sided, star-shaped recess 14 which affords a locking means for the head of the hexagonal pivot bolt in the rest position of said bolt. A nut

15 is mounted to the opposite, threaded end of the bolt, the nut being locked in position by means of a washer 16 which is arranged to bite in a machined portion of the bolt shank.

What we claim is:

1. A jaw assembly comprising two jaws which are arranged to be pivotally connected together and each of which have one end thereof adapted for pivotable connection to a respective actuating device of a bolt cutting device, such as a handle-arm, by means of which the jaws of the bolt cutting device can be mutually rotated, and the outer end of which jaws are provided with cutting edges which, upon rotating of the jaws, are arranged to move toward and away from each other but not beyond each other, and the cutting edge lines of which cutting edges are positioned in one and the same plane of rotation, characterized in that the jaws are pivotally mounted about a single, common pivot means, in that each jaw on its respective side of the jaw pair in the region of the pivot means has a support flange which overlaps the adjacent jaw; in that the overlapping region of the jaws formed by their support flanges around the pivot means has on each jaw a radially inner contact surface for forming a co-acting pair of radially inner guide surfaces and two outer contact surfaces which are located at substantially equal radial distances from the pivot means, said two outer contact surfaces being arranged to co-act pairwise with the outer contact surfaces on the opposing jaw within the limits of the mutual pivoting movement of the jaws, thereby to form two pairs of radially outer guide surfaces; in that the three pairs of guide surfaces are located in three separate, parallel planes of rotation; in that the radial inner pair of guide surfaces is located in the intermediate plane of said three planes; and in that on each jaw one of the radially outer contact surfaces is located on the support flange and is depressed in relation to the radially inner contact surface.

2. A jaw arrangement according to claim 1, characterized in that all of said contact surfaces are arranged on bosses located in the jaw material and are calibrated by embossing.

3. A jaw arrangement according to claim 1 characterized in that the radial extension of the contact surfaces is such that the mutual position of the jaws can be adjusted by means of the pivot means, which has the form of an eccentric bolt.

4. A jaw arrangement according to claim 2, characterized in that the radial extension of the contact surfaces is such that the mutual position of the jaws can be adjusted by means of the pivot means, which has the form of an eccentric bolt.

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