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GB 2150478 A GB 2112686 A US 4175734 A
US 3875645 A

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(54) Clamping device for thin panels

(57) A device which will clamp thin panels in close proximity abutment to each other has a thumb-grip 4, a bridge-piece 2, a toggle-bar 3 and a pin 1. The toggle-bar and the pin are able to pass through a narrow joint gap between those panels which are to be clamped. Rotation of the thumb grip 4 along ramps 5 raises the toggle-bar/pin assembly, whereupon the toggle-bar is trapped beneath the panels and the panels are clamped between the toggle-bar and the bridge-piece. The device requires access to one side only of the panelwork in order to fit manipulate and remove it, and may, for example, be used to support repair panels on double-skinned motor vehicle bodies in preparation for butt-weld jointing.

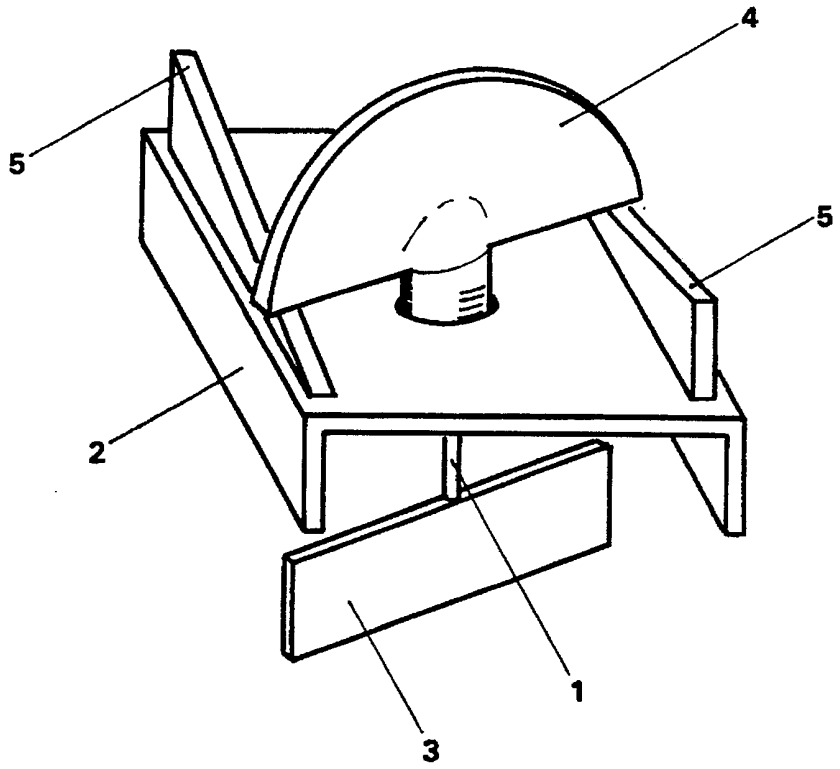

Fig 1

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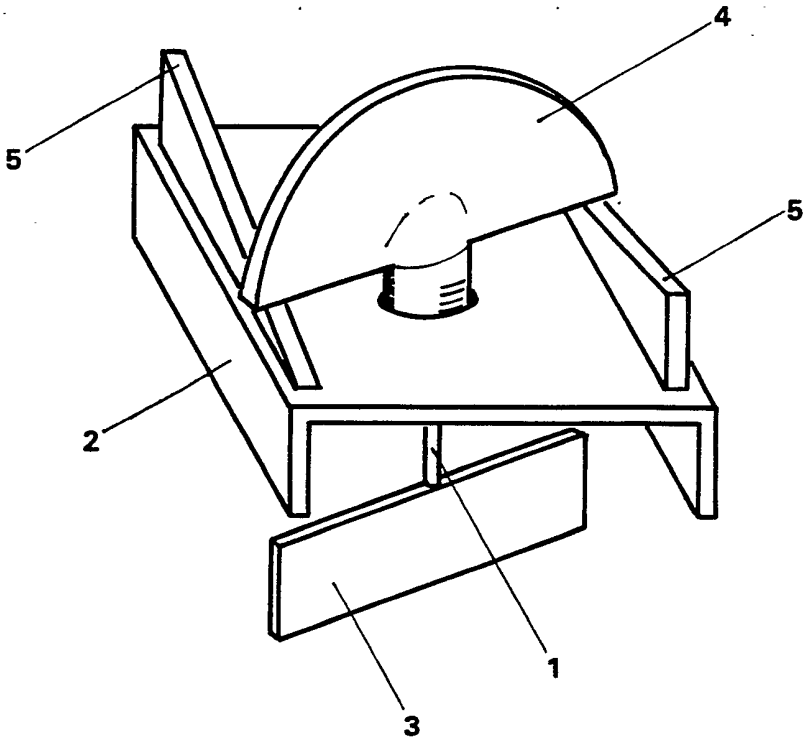

Fig 1

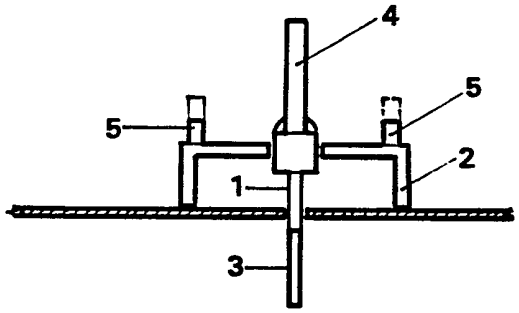

Fig 2

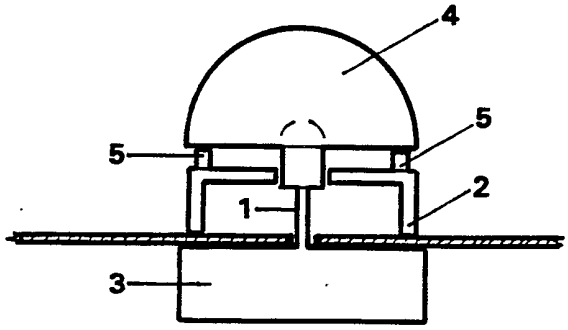

Fig 3

CLAMPING DEVICE FOR THIN PANELS

This invention relates to the support and location of thin sheet materials which need to be held in close abutment to one another, such as those metal repair panels which are used in motor vehicle body repair and which need to be temporarily clamped in place with a narrow joint gap in preparation for butt welding.

Motor vehicle body repair work often involves the making good of a damaged/corroded area which is cut out of the body panel on the vehicle and replaced by welding in a new part panel (known as a repair panel). This method of repair may be chosen instead of full panel replacement for economic reasons or, particularly in the case of older vehicles, because full replacement panels are not available.

Normal procedure is to support the repair panel using temporary fixings, to tack weld the joint at intervals, then to remove the temporary fixings and complete the joint by continuous welding.

For high quality work a butt joint between the repair panel and the original panel is preferred to an overlap joint because the standard of fit and finish will be better, and there is less possibility of corrosion-inducing moisture entering the joint at a later date.

Supporting a repair panel in its correct location prior to butt welding is particularly difficult since the pieces to be joined are not in physical contact - a narrow gap must be maintained to allow proper weld penetration of the joint. This precludes the use of such temporary fixings as screws or rivets, and conventional (jaw type) welding clamps are usually unsatisfactory for the same reason.

Magnetic clamps are sometimes used for this purpose, but they will only work on clean ferrous material and their gripping power is limited. A special device exists which will effectively clamp thin sheet material prior to butt welding, but it requires access to both the front and the rear of the joint in order to use it. Such two-sided access is frequently denied by the boxed sections and other double-skinned sections found in motor vehicle bodywork.

According to the present invention there is provided a device for clamping thin panels of sheet material in close proximity abutment to each other comprising a thumb-grip, a bridge-piece, a toggle-bar/pin assembly, means for rotating the toggle-bar/pin assembly and raising same relative to the bridge-piece, the toggle-bar/pin assembly being capable of passing through a narrow joint gap between the aforesaid panels such that access is required to one side only of the panelwork in order to fit, to manipulate and to remove the device.

A specific embodiment of the invention and a particular usage of it as a temporary support for a motor vehicle body repair panel prior to butt welding of the panel joint will now be described by way of example with reference to the accompanying drawing in which:-

Figure 1 shows, in perspective, the general arrangement of the device;

Figure 2 shows, in section, the device entered into the work;

Figure 3 shows, in section, the device in its clamped position.

Referring to the drawing, the device comprises a pin 1 connecting a thin toggle-bar 3 below a bridge-piece 2 to a thumb-grip 4 above the bridge-piece. The bridge-piece is fitted with a pair of inclined ramps 5. The thumb-grip can rotate within the bridge-piece and, in doing so, rides up the ramps thereby simultaneously rotating the toggle-bar and raising it relative to the bridge-piece. The toggle-bar and pin are sufficiently thin to pass through a narrow joint gap between the panels, and, once inserted, a twisting action applied to the thumb-grip both traps the toggle-bar under the panels and clamps the panels between the toggle-bar and the bridge-piece.

As an example of one particular use of the device, the following steps would be carried out in order to support a motor vehicle body repair panel prior to butt-weld jointing:-

A) The clamp is offered up to the work with the thumb-grip in its lowest position (ie. off the ramps), and the toggle/pin assembly is passed through the joint gap so that the bridge-piece straddles the joint [Figure 2].

B) The thumb-grip is rotated on to the ramps and turned sufficiently to bring the toggle-bar into firm contact with the underside of the panelwork, thus trapping the toggle-bar and clamping the two panels between the toggle-bar and the bridge-piece [Figure 3].

C) Further clamps can be fitted in like manner in order to adequately support the repair panel, allowing tack welds to be made at suitable intervals, whereupon the clamps can be loosened and withdrawn prior to the joint being completed by continuous welding.

CLAIMS

1) A device for clamping thin panels of sheet material in close proximity abutment to each other comprising a thumb-grip, a bridge-piece, a toggle-bar/pin assembly, means for rotating the toggle-bar/pin assembly and raising same relative to the bridge-piece, the toggle-bar/pin assembly being capable of passing through a narrow joint gap between the aforesaid panels such that access is required to one side only of the panelwork in order to fit, to manipulate and to remove the device.

2) A clamping device as claimed in Claim 1 wherein the thumb-grip is free to rotate within the bridge-piece, and the lower end of the thumb-grip which end is the end protruding through the bridge-piece is rigidly connected to the toggle-bar by the pin.

3) A clamping device as claimed in Claim 2 wherein the method of rotating and raising the toggle-bar is by rotating the thumb-grip on to inclined ramps provided upon the bridge-piece.

4) A clamping device substantially as described herein with reference to Figures 1-3 of the accompanying drawing.

Amendments to the claims
have been filed as follows

1) A device for clamping thin panels of sheet material in close proximity abutment to each other such that access is required to one side only of the panelwork in order to fit, to manipulate and to remove the device, which device comprises a thumb-grip, a bridge-piece and a toggle-bar/pin assembly, the toggle-bar/pin assembly being capable of passing through a narrow joint gap between the aforesaid panels, the thumb-grip being free to rotate within the bridge-piece, and the lower end of the thumb-grip which end is the end protruding through the bridge-piece being rigidly connected to the toggle-bar by the pin, wherein the rotation of the thumb-grip on to inclined ramps provided upon the bridge-piece rotates the toggle-bar/pin assembly and raises same relative to the bridge-piece.

2) A clamping device substantially as described herein with reference to Figures 1-3 of the accompanying drawing.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number

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Relevant Technical fields

(i) UK Cl (Edition L) B3R

(ii) Int Cl (Edition 5) B23K

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

D N P BUTTERS

Date of Search

16 FEBRUARY 1993

Documents considered relevant following a search in respect of claims 1-4

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2150478 (C C A)	1
X	GB 2112686 (GRIFFIN)	1, 2
X	US 4175734 (WILLIAMS)	1, 2
X	US 3875645 (GENERAL DYNAMICS)	1, 2

		to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

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