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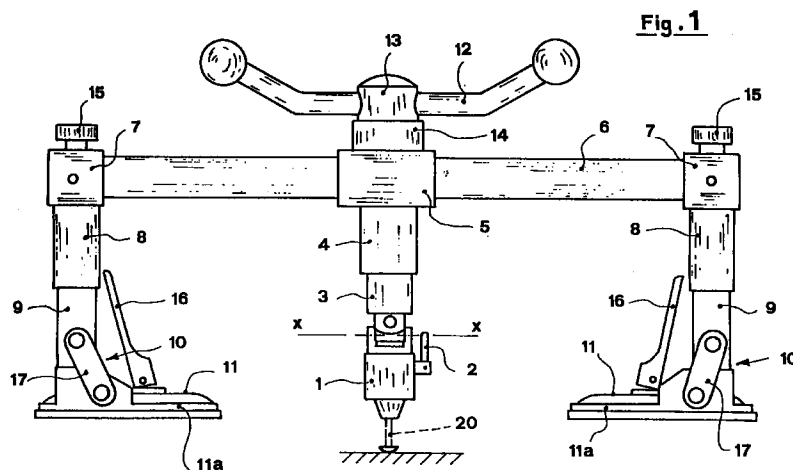
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**(54) Device for straightening dented vehicle body parts**

(57) A device for straightening dented parts of the surface of a vehicle body comprising axial grip means (1) for a metal stem (20) which is temporarily fixed to the dented part, the means being slideably mounted along a guide (6) which is substantially parallel to the surface

and is suitable to be temporarily rigidly coupled to the surface by virtue of fixing means (11). The grip means can be made to slide axially so as to apply a controlled traction or compression force to the surface.



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## Description

The present invention relates to a device for straightening dented parts of a vehicle body.

In order to repair damage of the above-mentioned kind to the body of a vehicle, currently a metal stem is temporarily applied by welding in the lowest point of the dent and then traction is applied with a specific tool which is substantially configured like a caliper and comprises, for example, a chuck head suitable to grip and clamp the stem and a chuck support on which a mass slides which is rigidly coupled to the chuck. By holding the tool with one's hands while acting on the mass, optionally with a beating action, the stem is pulled and the dented surface is gradually lifted until its correct position is restored.

This widespread system, however, is awkward, since the tool must be held in position with one hand while the other hand acts on the sliding mass, and this is not easy to do, requiring considerable experience most of all to adjust the correct traction to be applied.

The aim of the present invention is to provide a device for straightening dented parts of a vehicle body which at the same time allows a less awkward maneuver and a better possibility to control the effects of the action applied to the damaged part of the body.

This aim is achieved with a device according to the present invention for straightening dented parts of a vehicle body, which comprises axial grip means for a metal stem which is temporarily fixed to said dented part and wherein the grip means can slide along a guide which is substantially parallel to the surface of the body, said guide being suitable to be temporarily rigidly coupled to said body by virtue of fixing means, particularly of the sucker type. The stem grip means can slide at right angles to said guide so as to be able to apply a traction or compression force to the surface through said stem.

The invention is now illustrated in greater detail with the following description of an embodiment thereof, given by way of non-limitative example with reference to the accompanying drawings, wherein:

figure 1 is a front elevation view of the device according to the present invention;  
figure 2 is a top plan view of the device of figure 1;  
figure 3 is a side elevation view of the device according to the invention.

With reference to the above figures, the reference numeral 1 designates a chuck or clamp for gripping, by means of a lever 2, a stem 20 which is temporarily welded to the vehicle body part which bears damage in the form of a dent. The chuck or clamp 1 is rigidly coupled to a shaft 3 which is slidingly mounted within a sleeve 4 which protrudes from a sliding block 5 which is slidingly mounted on two parallel cylindrical bars 6 which are connected in pairs, at their ends, by means of

respective supports 7. The chuck 1 is furthermore rotatably connected to the shaft 3 about the axis X-X so that it can be orientated axially. A sleeve 8 protrudes centrally, and on the same side as the mandrel 1, from each one of the supports 7; a stem 9 is slidingly engaged in said sleeve and supports an articulation 10 for a sucker 11. Said articulation, in particular, comprises an arm 17 which is pivoted to the stem 9 and to a backing pad 11a for the sucker 11, so that the sucker can be tilted with respect to the direction of the bars 6.

The sliding of the shaft 3 that supports the chuck 1 at right angles to the guide formed by the cylindrical bars 6 is achieved by means of a handle 12 that protrudes radially from a head 13 which is rigidly coupled to the shaft 3 and is engaged by means of a screw coupling in a collar 14 located on the sliding block 5.

The stems 9 that support the suckers 11 are in turn rigidly coupled to knobs 15 which are engaged by means of a screw coupling in the sleeves 8 through the supports 7. The suckers 11 also comprise respective eccentric levers 16 for making said suckers adhere to the surface or separate therefrom when the straightening operation is complete.

When using the device according to the present invention, first of all the clamp 1 is used to lock the stem, which has been fixed beforehand to the surface to be straightened; then, by acting on the knobs 15, the suckers 11 are placed in contact with said surface, optionally by adjusting their position by means of the articulation 10 whereby the stems 9 are connected. Then, by acting on the levers 16, the suckers 11 are caused to adhere to the surface and the device thus remains locked in the working position. At this point the intended action begins to be applied to the surface to be straightened by rotating the lever handle 12, which draws the shaft 3 into the sleeve 4. By means of the device according to the present invention, the applied traction can be controlled with considerable precision and interrupted exactly when the damaged surface is restored to its original shape, optionally then moving the device to an adjacent point to continue the repair work.

The device according to the present invention can also be used to simultaneously pull a plurality of stems which are fixed in nearby points of the same surface and are mutually connected by means of a suitable tool.

Advantageously, the device according to the invention can be mounted on an arm which protrudes from a wheeled turret, not shown. The turret can be allowed to slide vertically and rotate axially, while the supporting arm protruding therefrom can be allowed to slide and rotate axially so as to allow considerable maneuvering flexibility and easy positioning of the device mounted at its end.

It is also evident that instead of the suckers 11 it is possible to use equivalent fixing means, for example of the magnetic type.

The invention is not limited to the above-described and illustrated embodiment but includes any construc-

tive variation thereof.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

## Claims

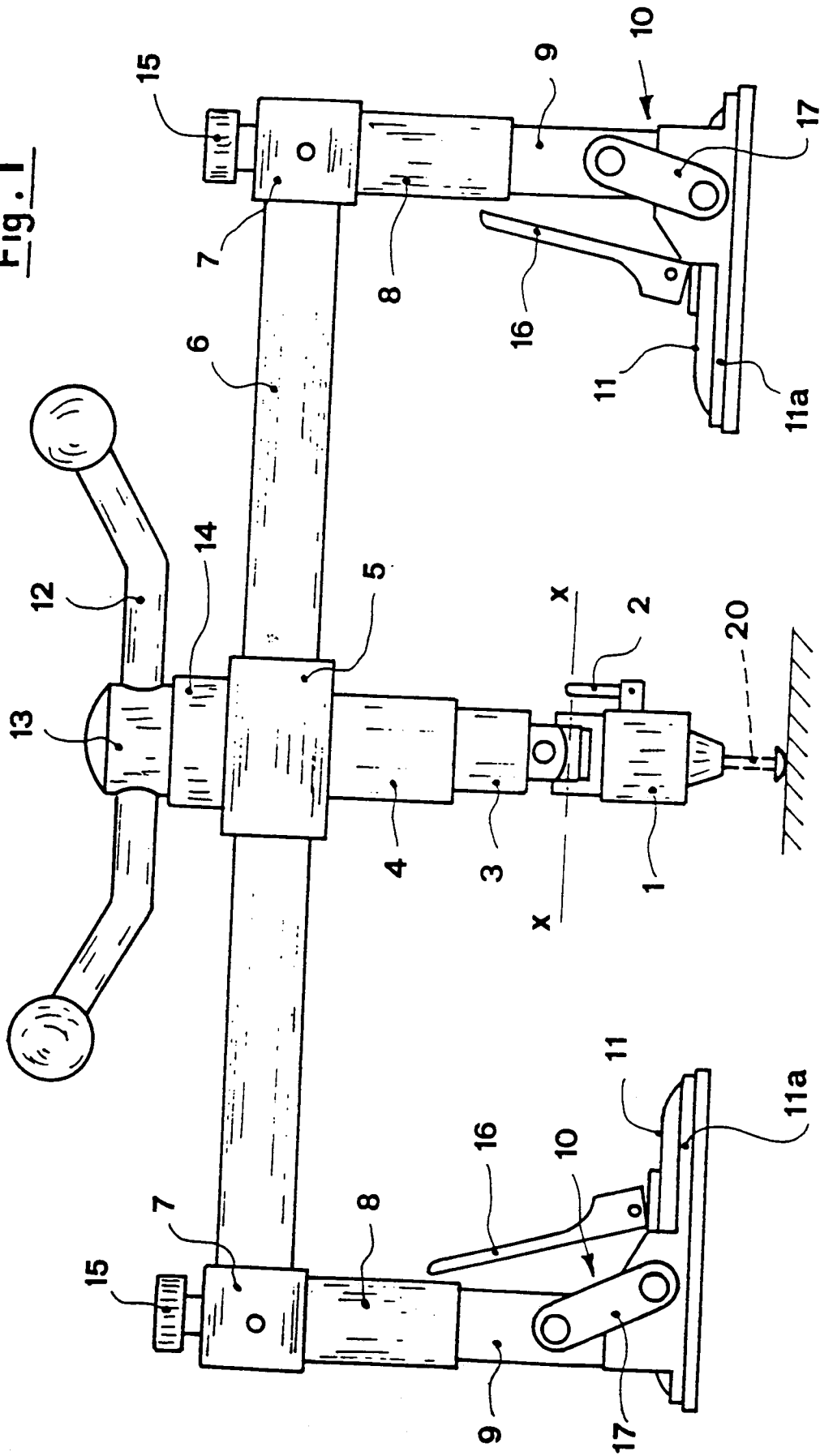
1. A device for straightening dented parts of the surface of a vehicle body, comprising axial grip means for a metal stem which is temporarily fixed to said dented part, characterized in that said grip means are slideably mounted along a guide which is substantially parallel to said surface and is suitable to be temporarily rigidly coupled to said surface by virtue of fixing means, means being provided for producing the axial sliding of said grip means so as to apply a controlled traction or compression force to said surface.
2. A device according to claim 1, characterized in that said grip means are articulately connected to a shaft which is slidingly engaged in a sleeve that protrudes from a sliding block which can slide on said guide, said means for actuating the sliding of said grip means being arranged on said sliding block and being rigidly coupled to said shaft.
3. A device according to the preceding claims, characterized in that the distance between said guide and said fixing means is adjustable.
4. A device according to the preceding claims, characterized in that said fixing means are of the sucker type.
5. A device according to the preceding claims, characterized in that it is mounted at the end of an arm that protrudes from a wheeled turret, said arm and said turret being able to slide and rotate axially.

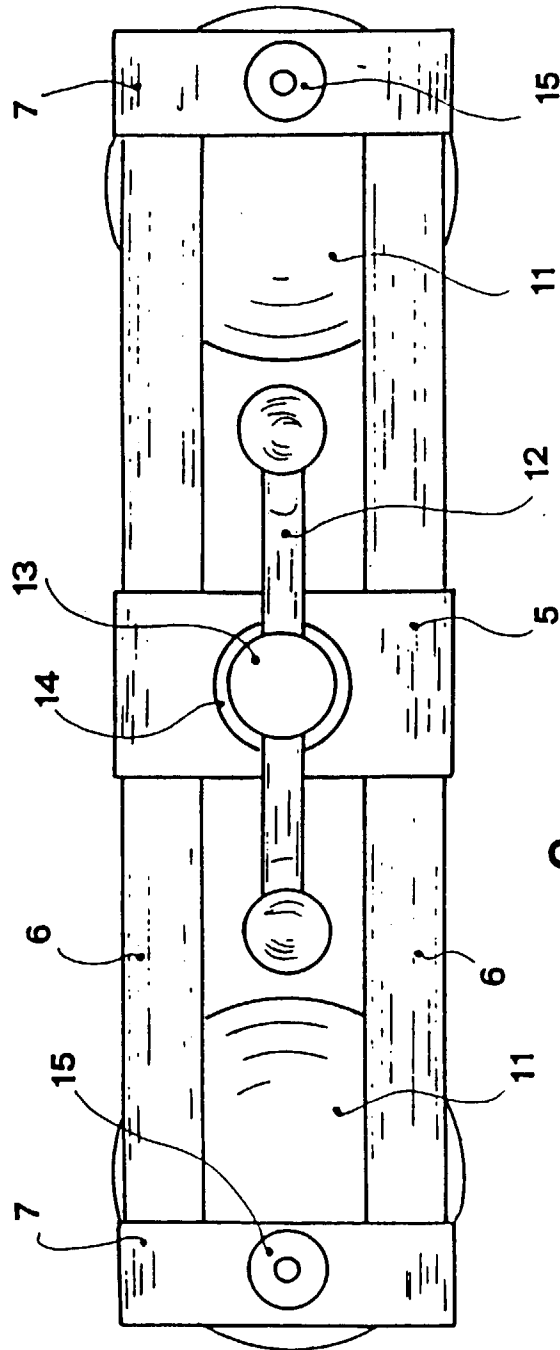
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**Fig. 1**





**Fig. 2**

