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(54) Device for serrating knife blades.

(57) This invention relates to a device for the serration of new knife blades by
means of a grinder (16) with an external cylindrical surface grooved circularly, to be performed on a new blade (12). The device includes a unit (13) designed to rotate/translate and support a sample blade (11) having a serration which interacts with the fixed locator element (15) that is toothed and of the rack-type, and a chuck unit (14) designed to rotate/translate with said sample blade support unit (11) and which supports the new blade (12) to be serrated by said grinder (16).

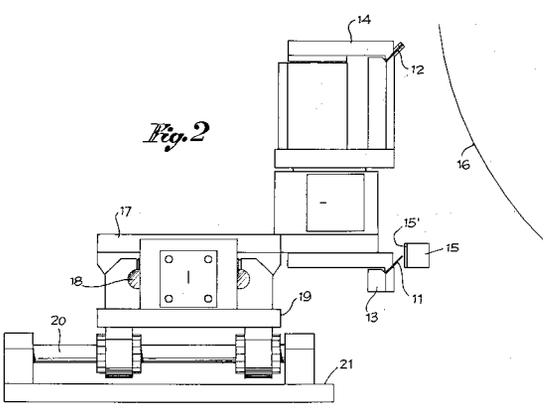

Fig. 2

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This invention relates to an automatic device for the serration of knife blades by means of a grinder.

Knife blades are usually serrated by means of a grinder in which each blade to be serrated is positioned by an operator. According to the state of the art, the peripheral surface of the grinder, view in cross section, must be shaped complementarily to the blade to be serrated. This evidently requires the use of a differently shaped grinder for each type or shape of blade, and means it is difficult to dress the grinders when necessary. The result is increased tooling and running costs for a knife blade serrating unit and the permanent risk of danger to the operator working in contact with the grinder.

The aim of this invention is to overcome these inconveniences by means of a new original solution to the problem of serrating knife blades of different shapes.

In accordance with the present invention there is provided a device for serrating knife blades which uses a grinder substantially with a cylindrical peripheral surface, hence not shaped, although grooved circularly, and a ready-made sample blade to be copied for serrating each new blade.

Thus, the operation of serrating a new knife blade substantially becomes the result of a reproduction, or copying, of a sample blade, the latter being used as a template and interracting with a rack-type toothed locator to govern the movements of a chuck onto which is secured the blade to be serrated in relation to the grinder.

To this end, this invention provides a device for serrating knife blades according to claim 1.

There are thus the advantages of:

- eliminating the need for differently-shaped grinders for each type of blade;
- being able to use grinders that have a simpler structure and are more economical;
- using, with the same serration results, the same grinder for each and every blade shaped, merely by replacing the sample blade;
- increasing the safety of the operator, who can work at a distance from the grinder, thus reducing the risks deriving from the use of abrasive grinders, such as explosion of the grinder, microfragmentation, which is dangerous for the eye, contact with coolants, etc.; and, last but not least,
- of providing an automatic blade loading/unloading system to increase the productivity of the system.

Further details of this invention will become more evident from the description made with reference to the diagrams here attached, in which:

Figure 1 shows a perspective view of the device for serrating knife blades;

Figure 2 is a side view of the device shown in figure 1 with relation to a grinder;

Figures 3 and 4 show a plan view of the device in two different positions during the operation of serrating a blade; and

Figures 5a, 5b, 5c and 5d show, schematically, some phases in sequence of the serrating of a knife blade.

With reference to these diagrams, number 11 refers to a sample blade or the like previously prepared and serrrated, and number 12 refers to an identically shaped knife blade to be serrated in correspondence with the sample blade 11.

That having been stated, the device under study substantially includes a support unit 13 for the sample blade 11 and a chuck 14 to receive the blade to be serrated 12. The two units 13 and 14 are superimposed so that unit 13 carrying the sample blade 11 is below and the chuck 14 is above, and the sample blade 11 and the blade to be serrated 12 are preferably aligned vertically.

Furthermore, the sample blade 11 faces the toothed locator element 15 in the shape of a rack 15' corresponding to the type of serration to be made, whereas the blade to be serrated 12 faces a grinder 16 with a cylindrical surface and is suitably grooved circularly in correspondence with the required serration.

The two units 13,14 are mounted on a first slide 17 and designed to rotate round a common vertical axis.

The first slide 17 moves along guides 18 that are parallel to the axis of the grinder 16 and to the toothed locator element 15. The guides 18 are supported in turn by a second slide 19 running on horizontal lines 20 secured to a stationary plane 21 and at right angles to the guides 18.

The running of the second slide 19 along the guides 20 makes it possible to move the units 13,14 towards and away from the locator element 15 and the grinder 16, respectively, whereas the running of the first slide 17 along the guide 18 makes it possible to translate the units 13,14 parallelly to the axis of the grinder 16, units 13,14 being able to rotate simultaneously around their vertical axes.

The movements of the slides 17, 19 and rotation of the units can be suitably controlled during the work cycle of the device.

In practice, as has been stated above, serration of the new blade 12 is done by reproducing, i.e. copying, the serration of the sample blade 11 with the help of the grinder 16 and thanks to the combined movements of the sample blade 11 and the new blade 12 which are enabled by the horizontally running slides and by rotation of unit 13 supporting

the sample blade 11 and the chuck with the new blade 12.

Such reproduction, or copying, can be performed by rotating the sample blade 11 on the rack-type locator element 15, which is toothed correspondingly. Such rotation of the sample blade 12 corresponds, by interaction with the toothing of the rack element 15, to rotation/translation of the chuck unit 13 in relation to the grinder, so that the new blade 12 is serrated as the sample blade, irrespective of the edge of the blade to be serrated.

Figure 5a shows the loading stage of a blade 12 to be serrated by the grinder 16.

It should be noted that loading can be automatic, by means of an appropriate loading device.

Figure 5b shows approach and rotation of the blade at the start of the grinding operation. Figures 5c and 5d show two other subsequent stages of the grinding of the blade 12, the movement of the blade being controlled by interaction of the sample blade 11 with the rack-type locator element.

It should be noted that the above description has been made with reference to a "sample blade" as an element to copy. This does not, however, exclude possibility of using as a "sample" any item other than a blade with the same shape and serration as the blade to be serrated.

Claims

2. A device according to claim 1, characterized in that the unit (13) supporting the sample blade (11) and the chuck unit (14) are superimposed and mounted to rotate on a first slide (17) that runs horizontally and parallely to the axis of the grinder (16), and in that said first slide (17) runs along a second slide (19) that is supported in turn and runs horizontally on a stationary plane (21) at right angles to the direction of movement of the first slide (17).

3. A device according to claims 1 and 2, in which said units (13, 14) and said slides (17, 19) are equipped with means for operating and controlling their movements.

4. A device according to any preceding claim, in which the unit (13) supporting the sample blade moves in such a way that the sample blade engages the rack-type locator element thus determining the movement of the blade to be serrated on the chuck (14) in relation to the grinder.

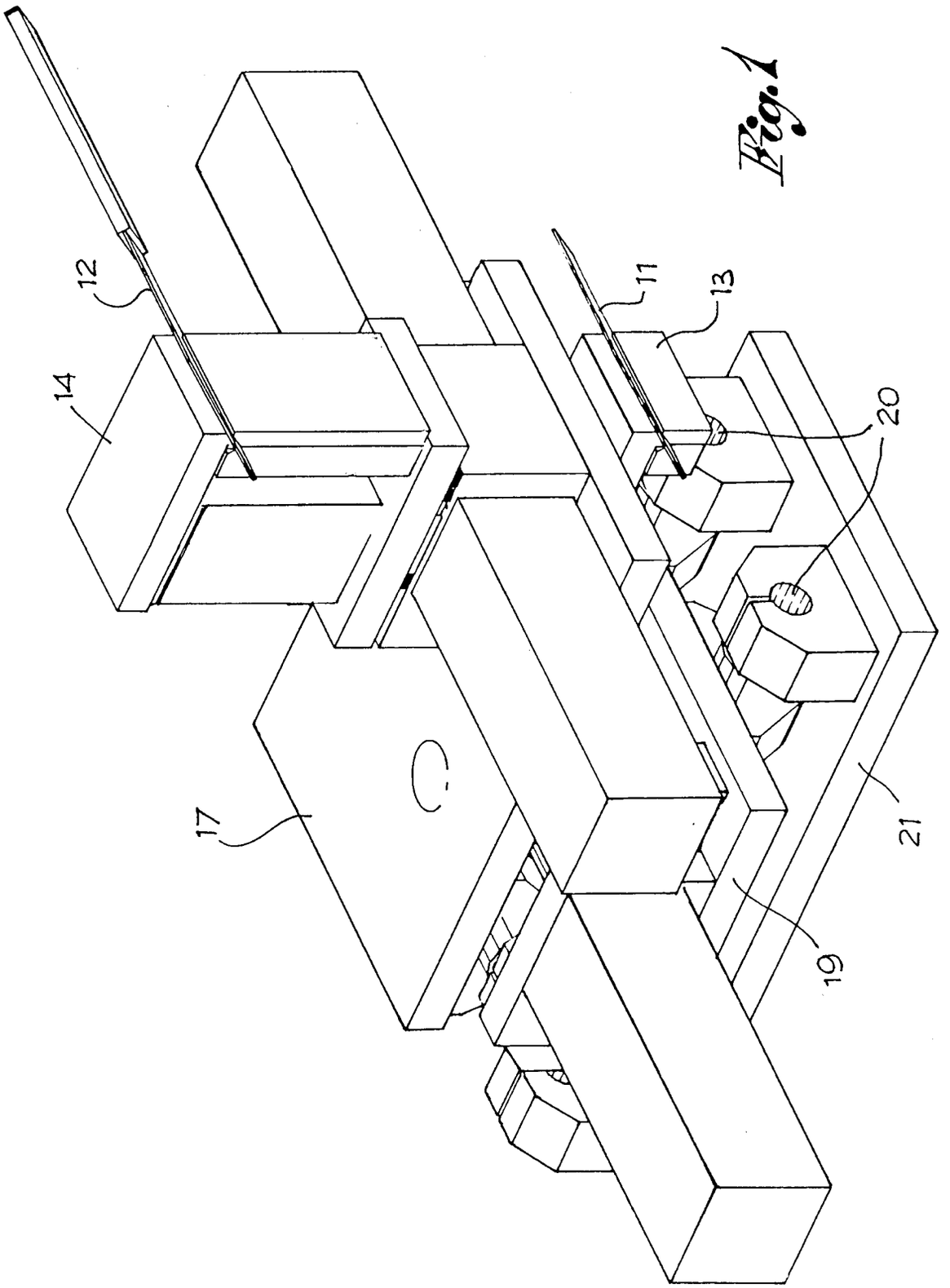

Fig. 1

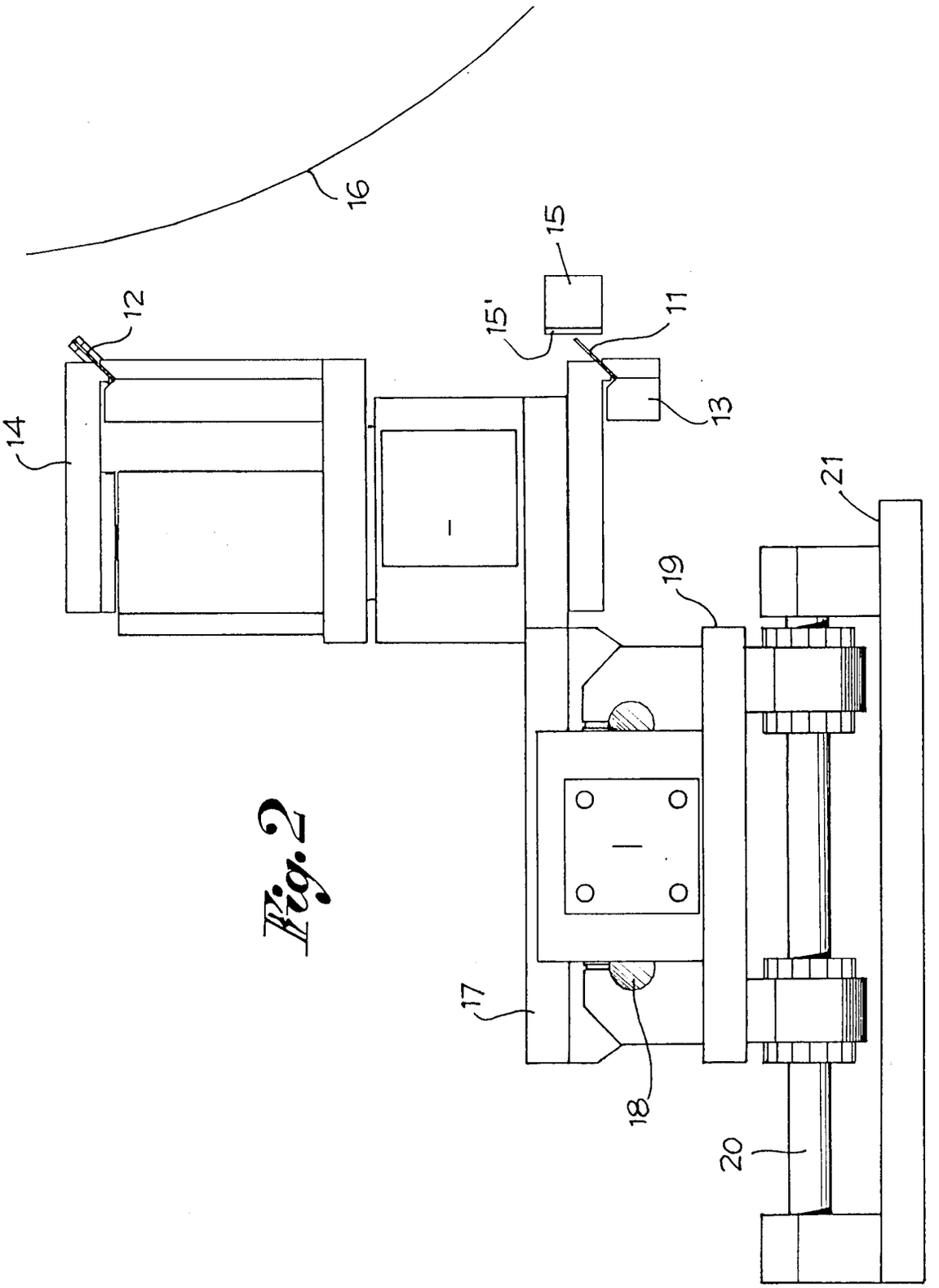

Fig. 2

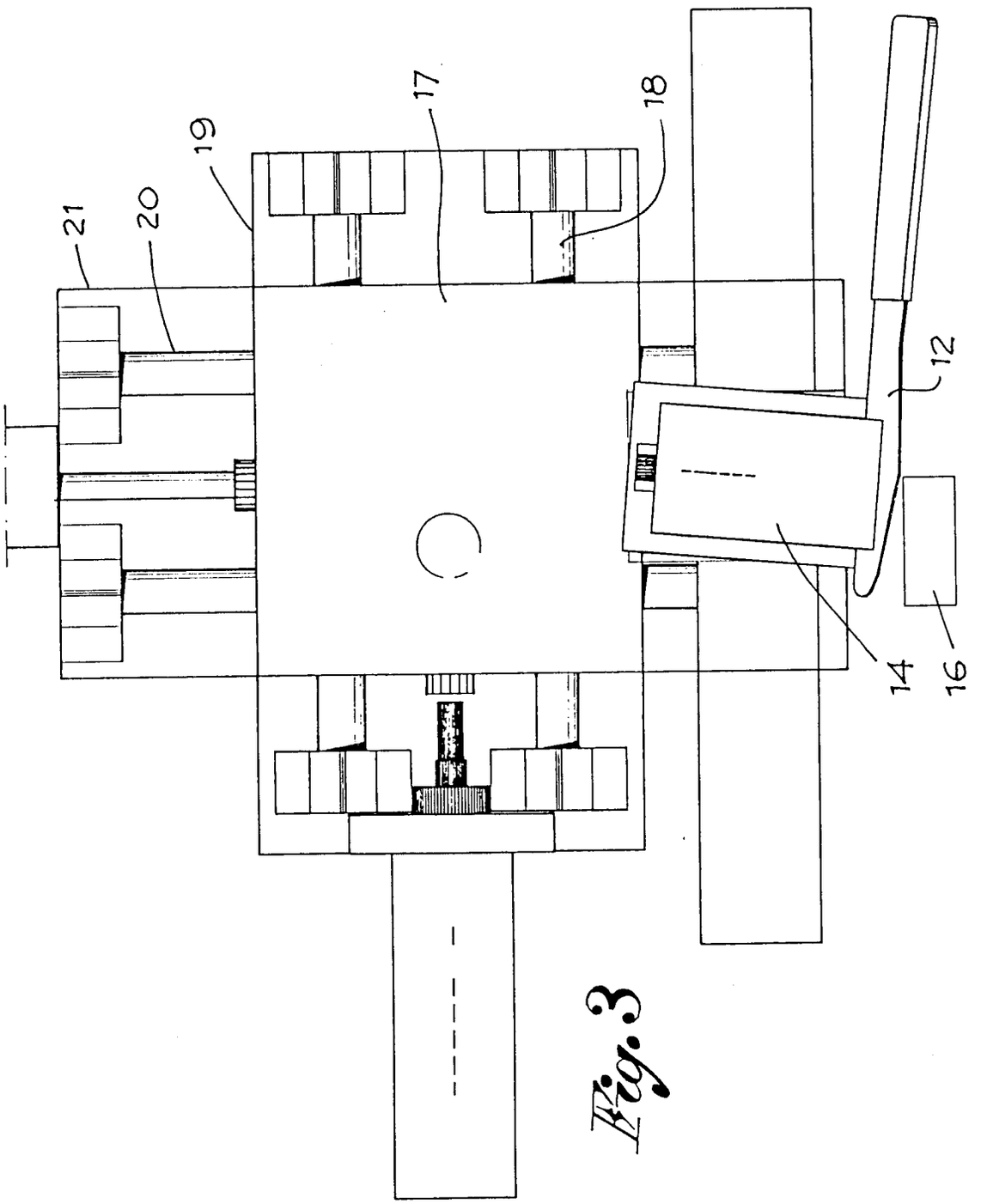

Fig. 3

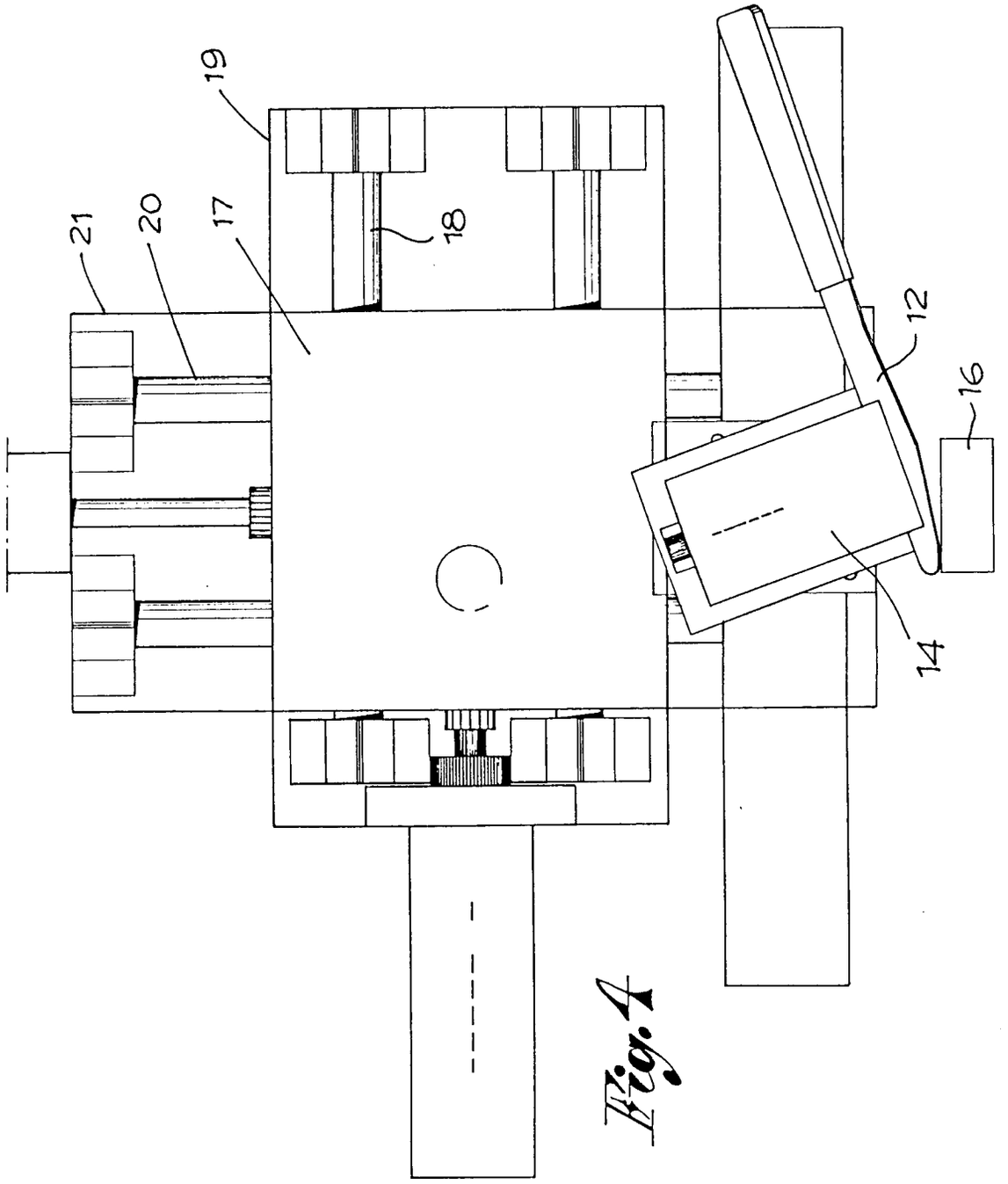

Fig. 4

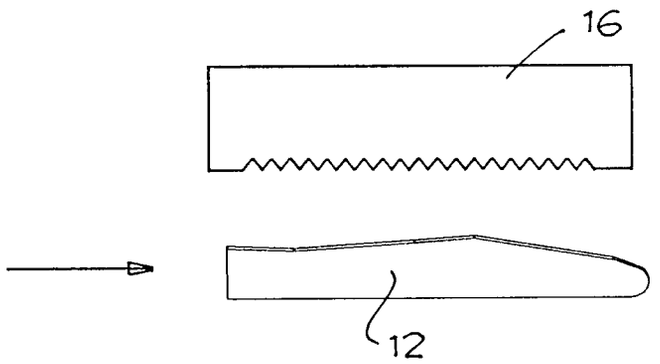

Fig.5a

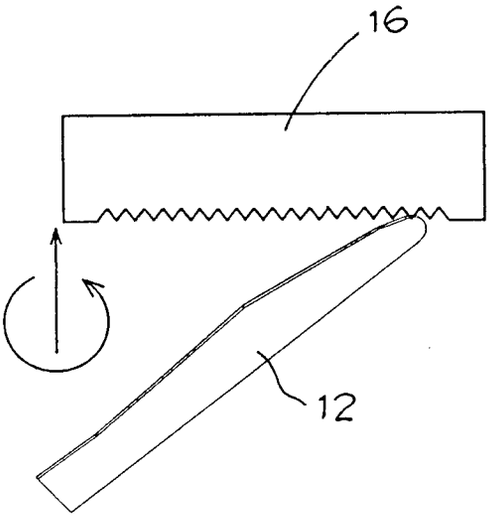

Fig.5b

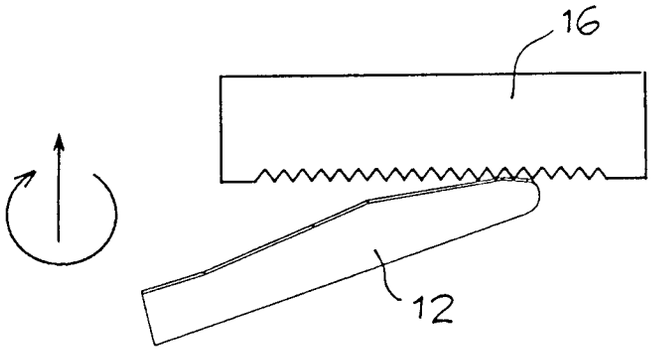

Fig.5c

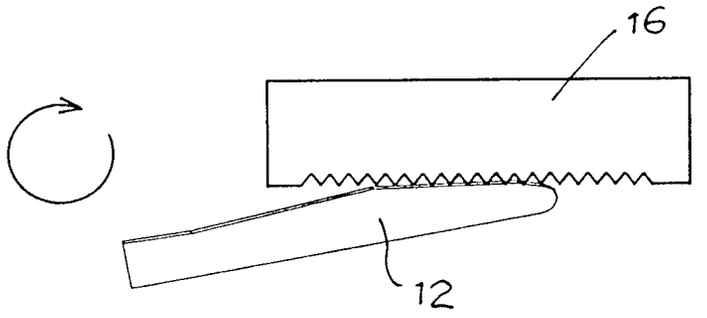

Fig.5d