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S. C. DENTON

3,306,135

DRILL-CHIP GUARD

Filed Aug. 8, 1963

FIG. 1

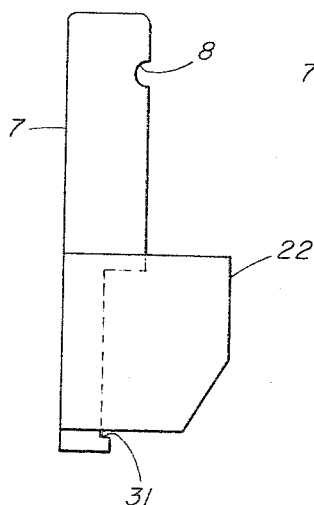


FIG. 3

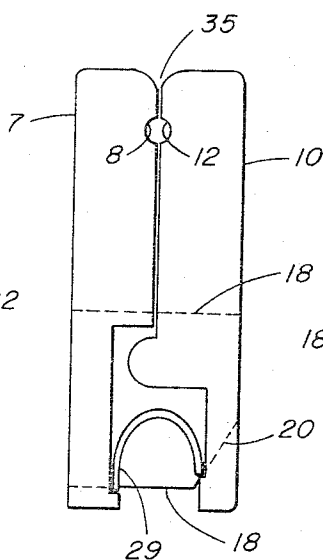


FIG. 2

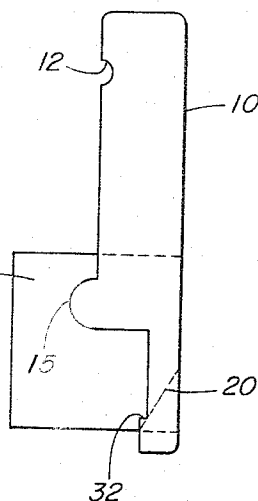
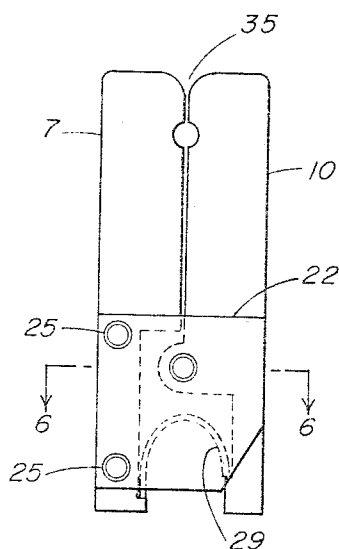


FIG. 4

FIG. 5

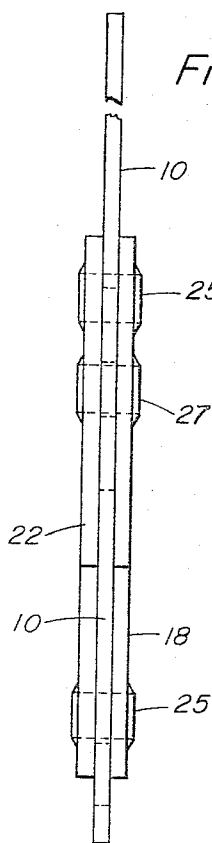
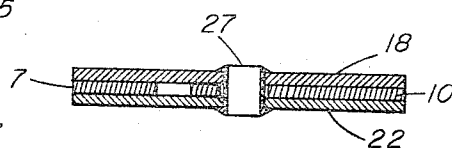


FIG. 6



INVENTOR.

STERLING C. DENTON

BY

Roy Griffith Jones

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3,306,135

DRILL-CHIP GUARD

Sterling C. Denton, 655 Black Oak Ridge Road,
Wayne, N.J. 07470

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This invention relates to a guard adapted to prevent chips, resulting from drilling operations, from entering a device, apparatus or machine where they cause damage.

One use for the guard illustrated in the drawings is to prevent drill chips from entering into a high-precision and expensive motor-generator set used in servo mechanisms, etc., and from damaging the ball bearings as drilling is done on the shaft of the set.

The guard will be found useful in other situations.

The guard as illustrated comprises a pair of flat, coplanar, and coating blades adapted to fit circumferentially around a shaft, which blades function as chip-excluding means, a pair of thin plates over the proximal portions of the faces of the blades, and rigidly fastened to one of the blades, the other blade being pivotally secured to the plates and a bowed or arched flat spring between the plates and under compression to bring the distal portions of the blades toward each other.

The drawings illustrate the invention, and in these:

FIG. 1 is a plan view of one of a protective blade, and a front plate laid on its upper face;

FIG. 2 is a plan view of the other blade laid on a back plate similar to the plate of FIG. 1;

FIG. 3 is a plan view of the blades assembled on a back plate but not secured thereto;

FIG. 4 is a plan view of the completed device, in which the left blade is fixedly riveted to both front and back plates, and in which the right blade is pivotally secured to front and back plates;

FIG. 5 is an enlarged right edge view of FIG. 4; and

FIG. 6 is a cross section on line 6-6 of FIG. 5.

Referring to the drawings for a detailed description, the numeral 7 indicates the thin, elongate, left blade. The inner edge of this blade is straight in its upper or distal portion, except for the semi-circular notch 8, while its proximal portion is cut back from its inner edge for reasons apparent hereinafter. The right blade 10 is of the same thickness, length and width as blade 7, and in the completed device is coplanar therewith and coterminous. The distal portion of the inner edge of blade 10, like that of blade 7, is straight, except for the semi-circular notch 12 formed therein, and the straight portions of the inner edges of the two blades are adapted to meet when closed, with the two notches forming a circular hold to receive crosswise a work piece, as a cylindrical shaft for example. The inner edge of the proximal part of blade 10 is cut back in part, and in part has a rounded extension 15 to provide for a pivoted connection of the blade.

A plate 18 underlies the proximal portions of the assembled blades (FIGS. 5 and 6), except for short terminal parts of the blades as hereinafter mentioned. The plate 18 is of the width of the two blades combined, and is approximately square, except that it is chamfered at

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the lower right corner to form a slanted edge 20. A front plate 22, which is a duplicate of plate 18, is laid on top of the proximal portions of the blades, in alignment with the lower or back plate 18. Both plates are fixedly riveted, adjacent one side, to the blade 7, by rivets 25 (FIGS. 4 and 5), and blade 10 is pivotally attached to both plates by rivet 27 (FIGS. 4, 5 and 6).

After the plates have been riveted to the blades, a flat spring 29 is bowed to compression and is then inserted between the plates and between the blades, from below, the convex side being the upper side, and the spring occupying part of the space provided by cutting back the proximal portions of the blades from their inner edges. The end portions of the compressed spring bear outwardly against the inner sides of the blades, urging the blades together above the pivotal point. The ends of the spring bear against shoulders 31 and 32 formed at the lower ends of blades 7 and 10 respectively, the spring being thereby retained.

To use the guard in the specific case mentioned above, the blades are opened by lateral pressure at their lower ends and placed around the circumference of the shaft at the notches and in contact with an end of the motor-generator set, to prevent chips from entering it when a radial hole is drilled in the shaft of the set and into another component, as a gear, for example, which is to be pinned to the shaft. The guard may also be placed around the shaft by pressing the ends of the blades, at their junction, against the shaft, as at the V35 (FIGS. 3 and 4), which pressure opens the blades.

What is claimed is:

1. A chip guard comprising two elongate coplanar and coating protective blades having in part straight, contacting inner edges when in closed position, and having opposed notches so formed that a work piece therein may be peripherally surrounded by the blades, plates on the proximal portions of both faces of the two blades, both plates fixedly secured to one and the same blade, the other blade pivotally connected to the plates intermediate its ends, and a flat, bowed, compressed spring between the blades exerting pressure to close them at their distal ends, said proximal portions of said blades being spaced a distance sufficient to allow said distal ends to separate an amount at least equal to the maximum distance between said notches when in said closed position.

2. The guard specified in claim 1, in which the proximal end portions of the blades are formed with shoulders to retain said spring at its ends, and in which the blades are rounded at the distal end of their meeting edges to facilitate slipping the guard around a circumferentially circular work piece.

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FRANCIS S. HUSAR, *Primary Examiner*.