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PACKING OF ROTARY CUTTERS

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Fig. 1.

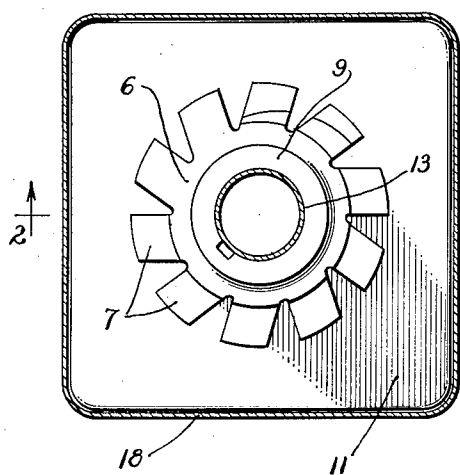


Fig. 2.

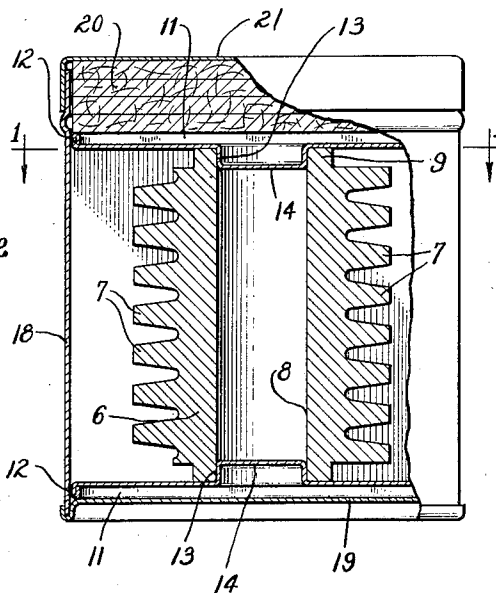


Fig. 3.

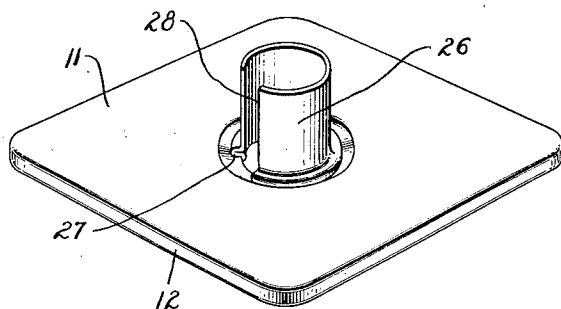
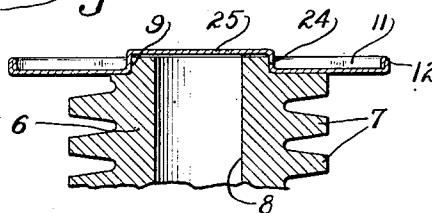


Fig. 4.



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PACKING OF ROTARY CUTTERS

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4 Claims. (Cl. 206—46)

This invention relates to the packing of rotary cutters to protect cutting edges during shipment, handling and storage, and more particularly to the packing of hobs, milling tools, and other cylindrical cutters having an open-ended bore extending axially of the cutter to receive an arbor by which the cutter is supported in service use.

The general object of the invention is to provide a new and improved package for the above purpose which is simple and inexpensive to construct and assemble, which effectually protects the sharpened edges of the cutter during shipment and handling, which avoids the necessity of wrapping the cutter in paper or cloth for shipment thereof, and which is of a permanent character and may be used conveniently by the machinist in storing the cutter throughout the service life of the latter.

A more detailed object is to provide a novel cutter package including spacer members adapted to be attached to opposite ends of a cutter and having edges projecting beyond the sharpened edges of the cutter so as to protect such edges by holding the periphery of the cutter out of contact with the walls of a container in which it is shipped or with a surface upon which the unpacked cutter is placed.

The invention also resides in the novel construction of the spacer members above referred to.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawing, in which

Figure 1 is a plan sectional view of a cutter package embodying the features of the present invention, the section being taken along the line 1—1 of Fig. 2.

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1.

Fig. 3 is a perspective view of a modified form of spacer member.

Fig. 4 is a fragmentary sectional view of another modification.

The cutter shown in the drawing by way of illustration is of the cylindrical type having a body 6 from which projects blades 7, the outer sharpened edges of which are to be protected in accordance with the present invention. Cutters of this type have a bore 8 extending axially thereof to receive the arbor by which the cutter is supported during use. Opposite ends of the cutter are also frequently formed with a relatively short annular shoulder 9 of a diameter slightly larger than the bore 8.

The present invention contemplates the attachment to opposite ends of the cutter of substantially flat space members telescoping with said ends preferably with a snug friction fit and having peripheral edges projecting beyond the sharpened edges of the cutter blades and shaped to conform to that of the container in which the cutter is to be shipped or stored. Herein the members are in the form of plates 11 of sheet metal having a beaded peripheral edge 12 to give strength and smoothness and a flanged central portion adapted to telescope either with the bore 8 or the annular shoulder 9.

In the preferred form shown in Fig. 1, the central flange is adapted to fit snugly within the bore 8 and is indicated by the numeral 13. It may be formed by depressing the central portion of the spacer plate inwardly leaving the inner end of the flange closed by a wall 14 which effectually reinforces the flange. The diameter of the flange is such that the flange will be received in the bore 8 with a snug friction fit. By employing a flange which engages the internal surface of the cutter body, the flange may be made of any desired length and thus adapted to hold the plate 11 effectually against tilting relative to the cutter.

It will be observed that the cutter and the plates 11 attached thereto as above described form in effect a spool of which the cutter constitutes the core, the peripheral or sharpened surface of which is held out of contact with any surface upon which the spool may be placed. For shipment and storage, the spool is intended to be placed in a container preferably made of sheet metal and having a side wall 18 of a square or rectangular cross-sectional shape in order to facilitate packing and storage on the shelves or the like. In packing, the cutter and spacer assembly covered with the proper lubricant is lowered endwise into the container with one plate 11 resting upon the bottom wall 19. Plates 20 of cardboard or other packing material are then laid upon the upper disk 11 after which a cover 21 is placed on the container, the cutter being held against axial movement. By varying the number and thickness of the plates 20, the width of this spacing element may be adjusted as desired.

When the cutter is packed as above described, the peripheral edges of the plates will engage the walls 18 and hold the sharpened edges of the cutter out of contact with the container. Since the plates are square in form and engageable with a substantial length of the side wall 18, the danger of the latter becoming bent outwardly in shipment or rough handling is effectually avoided. The cut-

ter may be removed from the container conveniently by inverting the latter after removal of the cover 21. If the spacer plates are made substantially larger than the smallest sizes of cutters, a relatively wide range of cutter sizes may be accommodated by the same package in as much as the bores 8 are of usually the same diameter in cutters of ordinary sizes.

It will be observed that the package above described is permanent in character and may be used advantageously by the machinist or in the stock room for storing the cutter after the same has been used in a machine tool. The plates 11 alone, when attached to the tool, serve to protect the sharpened edges by effectually holding the latter out of contact with a supporting surface upon which the cutter may be placed.

Instead of constructing the flanged central portion to fit into the bore 8 of the cutter, such portion may fit over and telescope with the annular shoulder 9. For this purpose, the spacer plate may be formed as shown in Fig. 4, the central portion being pressed in an axial direction to form a flange 24 fitting snugly over the shoulder 9 and closed by an integral end plate 25.

If desired, the central flange may be formed from a separate piece of sheet metal as shown in Fig. 3. In this modification, the flange is in the form of a tube 26 having one end projecting through an opening in the plate 11 and secured thereto as by annular flanges 27 clamping the defining edges of the opening between them. To facilitate entry of the flange into the base 8, the tube may be formed with a longitudinal slit 28. Any desired length of tube may be employed and being open at both ends, this form of spacer plate permits the cutter with the spacers thereon to be stored on wall pegs as is done in some machine shops.

The present invention also contemplates that the flanges for holding the cutter in centered position in the shipping container may be formed integral with or permanently attached to the bottom container wall 19 and the cover 21, the plates 11 being thereby omitted. It is preferred, however, to employ separate spacers which later may be used for protecting the cutter after removal from the container.

We claim as our invention:

1. A shipping package for a cylindrical cutter having annular surfaces at opposite ends thereof concentric with the cutter axis, said package comprising a container and a cover therefor with a body of substantially square cross-section adapted to receive said cutter with the axis of the latter perpendicular to the bottom of said container, two plates within the container at opposite ends of said cutter each conforming to the shape of and being slightly smaller than the container with their peripheral edges projecting beyond the sharpened edges of the cutter blades, annu-

lar flanges projecting axially from the centers of said plates and telescoping with said surfaces to provide a snug friction fit, said plates engaging the side wall of said container and acting to hold said cutter substantially centered in the container.

2. Means for protecting a cylindrical rotary cutter having an annular surface at one end thereof concentric with and smaller in diameter than the cutting surface of the cutter, said means comprising a substantially flat sheet metal plate having an outer free peripheral edge projecting beyond said cutting edges when the plate is placed against the end of said cutter, and a flange of relatively short length secured to said plate and adapted to telescope with said annular surface with a snug friction fit whereby to maintain the plate and cutter attached to each other during handling thereof.

3. A shipping package for a cylindrical cutter having annular surfaces at opposite ends thereof concentric with the cutter axis, said package comprising a container and a cover therefor with a body adapted to receive said cutter with the axis of the latter perpendicular to the bottom of the container, an annular shoulder projecting upwardly from said bottom and held against movement laterally of the container, said shoulder interengaging with one of said annular surfaces whereby to position the lower end of the cutter relative to said container, a plate formed separate from said cover and container and adapted, when received in the open end of the latter, to be held thereby against displacement laterally of the cutter, and means rigid with said plate providing an annular shoulder projecting axially from the plate into engagement with said other annular surface whereby to hold the upper end of the cutter against lateral displacement relative to said container.

4. A shipping package for a cylindrical cutter having annular surfaces at opposite ends thereof concentric with the cutter axis, said package comprising a container having spaced end walls one of which is removable from the body which is adapted to receive said cutter with the axis of the latter perpendicular to the bottom of the container, annular shoulders within said body at opposite ends of said cutter rigidly held against movement laterally of the container and interengaging with the respective annular surfaces whereby to position the cutter relative to said container, one of said shoulders being formed on a member structurally separate from said end walls, and adjustable spacing means interposed between said member and the adjacent end wall of the container whereby to hold the cutter against axial movement relative to the container.

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