Aug. 28, 1945. W. J. LANDRY 2,383,929

CUTTER ASSEMBLY FOR CAN OPENERS

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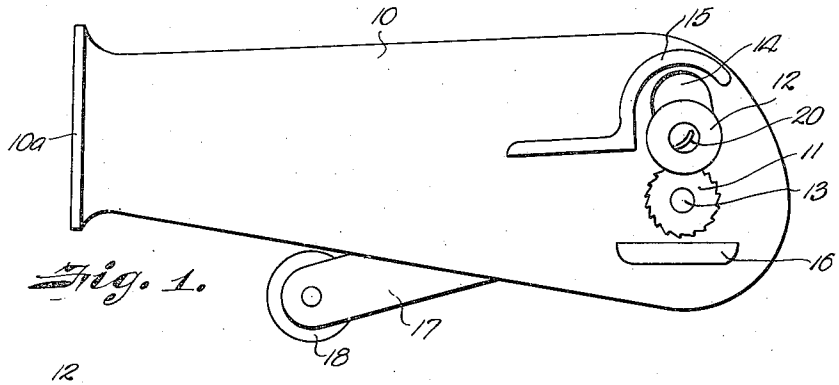
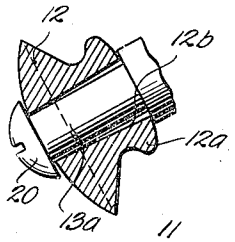


Fig. 1.



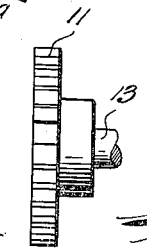


Fig. 2.

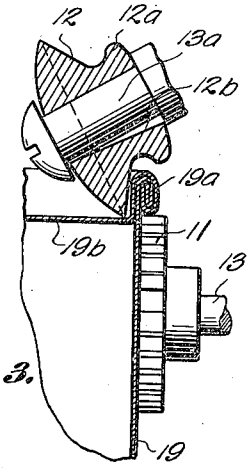


Fig. 3.

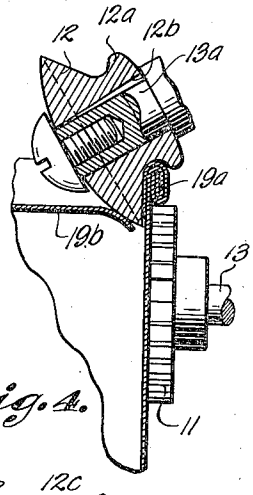


Fig. 4.

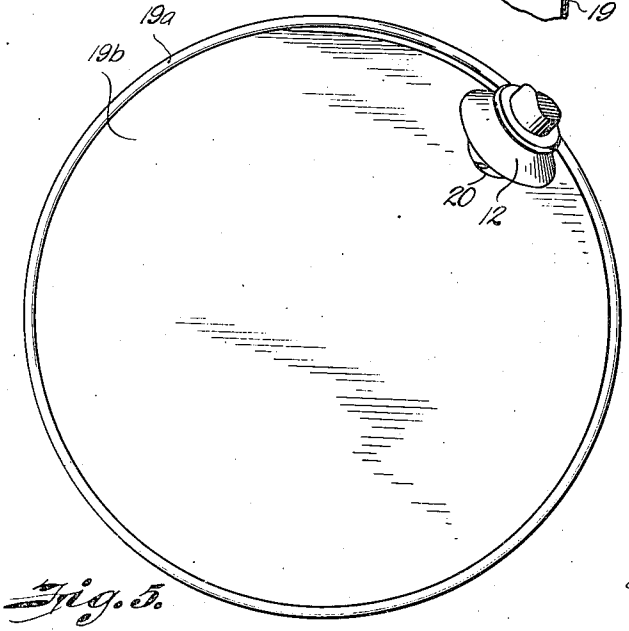


Fig. 5.

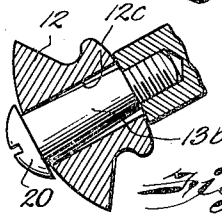


Fig. 6.

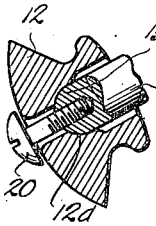


Fig. 7.

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CUTTER ASSEMBLY FOR CAN OPENERS

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6 Claims. (Cl. 30—15)

This invention relates to improvements in cutter assemblies for can openers and refers more particularly to the mounting of the disk cutter in openers employing a coacting feed gear and disk cutter. The disk mounting improves and facilitates the can opening operation and permits the cutter to closely follow the internal contour of the can rim.

Heretofore most can openers of this type have given trouble because the cutter would not closely follow the can rim contour and would produce a ragged or uneven edge during the cutting operation. Also the end of the cut in the can top would fail to meet or coincide with the pierced slit made at the start of the cut. In an attempt to correct these difficulties guides or abutments on the opener adjacent the cutting assembly have been resorted to. Such expedients are designed to tilt the can while it was being opened so the disk cutter is continuously fed slightly toward the flange or rim. Other manufacturers angle the axes of the feed gear and cutter shafts so as to obtain a like result. Typical of the latter is the patent to Olschewski 1,999,370, dated April 30, 1935, for which it is claimed that the edge of the cut metal remaining on the rim of the can is smooth because the cut is made close to the rim of the can and clearance will be provided for the cutter behind the point of cutting.

The present invention corrects the same difficulties by mounting the cutter on its shaft by an oscillating or wobbly bearing which permits the cutter during the opening operation and after the initial slit has been made in the can top to follow the can rim or flange although the radius of the curves in the rim be relatively short.

An additional advantage in the oscillating mounting is that it affords a rugged line bearing for the cutter capable of withstanding pressures to which it is subjected during the opening operation and provides a bearing which assures severance of the can top closely adjacent the rim or flange, eliminating sharp dangerous edges and projecting ledges around the top of the can which makes it difficult to entirely empty the can of its contents.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawing which forms a part of the instant specification and is to be read in conjunction therewith;

Fig. 1 is a diagrammatic view of a can opener showing an embodiment of the cutter assembly;

Fig. 2 is an enlarged detail of the cutter and feed gear separated for insertion of the can rim prior to cutting;

Fig. 3 is an enlarged detail of the cutter and feed gear with the can in position to be cut;

Fig. 4 is a similar view of the assembly shown in Fig. 3 after the edge of the cutter has stabbed the can and during the cutting operation;

Fig. 5 is a view of the can top showing the position of the cutter while the can is being opened;

Fig. 6 is a modified type of oscillating bearing;

Fig. 7 is a second modification of the oscillating bearing.

Referring to the drawing, at 10 is shown a can opener casing which houses the operating mechanism for separating and moving in close proximity feed gear 11 and disk cutter 12. The feed gear is mounted on a shaft 13 and the cutter on a shaft 14. A guard 15 is located above the cutter and a rest 16 below the feed gear, the latter holds the can clear of the lower edge of the feed gear. The base of the opener 10a is affixed to the wall either by a bracket or by screws and the mechanism within the housing is operated by means of a rotating arm 17 at the end of which is a handle 18. The operating mechanism of the can opener for separating and moving together the feed gear and cutter and for rotating the feed gear form no part of the present invention except as it is necessary to produce an operable device. In other words, the invention is applicable to any type of can opener employing a feed gear and disk cutter assembly for opening the top of a can where the cutter severs the top just inside the top flange of the can.

In Figs. 2, 3 and 4 the cutter and feed gear are shown in three positions. In Fig. 2 the gear and cutter are separated which is their position when the rim of the can is placed between them prior to cutting. In Fig. 3 the seam 19a of can 19 is between the cutter and gear with the outside lower edge of the seam or flange resting on the gear and the cutter lowered to a position just before piercing the top of the can. In Fig. 4 the cutter and gear have been brought into closer proximity and are now positioned in cutting relationship. Note that the edge of the cutter has pierced the top 19b of the can immediately adjacent the inside of the top seam so the inside face of the disk cutter lies parallel to the side of the can. The lower edge of the top seam of the can rests upon the feed gear and the top of the seam is engaged by the feed roller 12a formed at the base of the cutter. Rotation of the feed gear while the members are in this posi-

tion causes the serrated edge of the gear to engage the bottom of the can seam rotating the can and revolving the cutter on its shaft due to the frictional engagement of the groove in the cutter roller 12a with the top of the can seam. Rotation of the can and the cutter by the feed gear causes the edge of the cutter to sever the top from the can adjacent the seam.

This procedure for cutting out the top of a can is conventional with can openers employing this type of cutter assembly, but the cutter in openers of this type is usually mounted upon its shaft on a plain bearing, the axis of the cutter coinciding with the axis of the cutter shaft.

The proposed cutter assembly differs from what has gone before by mounting the cutter upon its shaft on an oscillating or wobbly bearing and in Figs. 2, 3 and 4 the oscillating effect is accomplished, by use of a plain cylindrical shaft end 13a and a tapered bearing within the cutter in the form of a truncated cone as shown at 12b. The cutter is held on the shaft by any suitable means such as a round head screw 20. By tapering the bearing hole through the cutter so it fits the shaft at the head and has a limited oscillatory movement at its base, the cutter at all times is supported by a straight line bearing as shown in Fig. 4. This bearing is capable of withstanding any reasonable pressure applied during the can opening operation and the wobbly mounting of the cutter permits the cutter to closely follow irregularities or sharp curves in the seam while severing the can top. The location of the cutter throughout the opening operation is indicated in Fig. 5 where in the opening of a cylindrical can the axis of the cutter automatically assumes a position parallel with any radii of the can as the cutter follows the circular seam. Only irregularities in the seam will cause the cutter to vary from this position. Thus by automatically positioning the cutter by means of the oscillating bearing tangentially with the inner curvature of the can seam, this cutter assembly is distinguished from other assemblies where the disk cutter is held at a slight angle with the inside curvature of the seam. Cutter assemblies of the latter type as previously suggested have the axis of the cutter purposely and rigidly positioned at a slight angle to cut toward the rim of the can and free the trailing edge of the cutter.

The oscillating or wobbling of the cutter on its shaft is shown in Figs. 2, 3 and 4 of the drawing. Prior to performing the can opening operation and when there is no pressure upon the cutter it will normally assume the position shown in Fig. 2, with the base of the cutter having a limited free movement radially upon its shaft. As the cutter is lowered and its cutting edge contacts the can top in the position shown in Fig. 3 the cutter will be canted so that the upper inner surface of the disk bearing will contact the upper surface of the shaft bearing. This is the position of the cutter on its shaft during the piercing operation. When the gear and cutter have been brought together to engage the can seam as in the can top severing position shown in Fig. 4, the cutter will assume a position such as that shown with the lower inner tapered surface of the cutter bearing upon the lower surface of the shaft. As the can and cutter are rotated, this line bearing between the bottom of the shaft and the bottom of the cutter bearing remains in the position shown in Fig. 4.

The modified construction shown in Fig. 6 differs from that shown in Figs. 2 and 4, inclusive, only in that the taper is on the cutter shaft 13b, while the bearing 12c in the cutter is cylindrical in shape, thus providing an oscillating joint identical in operation to that shown in the preceding figures. The second modification shown in Fig. 7 provides a ball and socket joint which permits the oscillatory movement of the cutter, the same as that provided by the preceding bearings. The ball for the joint is formed at 13c at the end of the shaft 13 and the socket 12d is machined in the cutter. In this modification, as before, the cutter is attached to the ball end of the shaft by a screw 20. While but three types of bearings have been shown it is contemplated that other methods for mounting the cutter on the shaft may be devised to obtain the oscillatory or wobbly action of the cutter. Such modifications are contemplated and are within the scope of the present invention.

From the foregoing it will be seen that the invention is one well adapted to attain all of the ends and objects hereinbefore set forth, together with other advantages which are obvious and which are inherent to the structure.

Having thus described my invention, I claim:

1. In a cutter assembly for can openers in which an upper shaft mounting a rotatable disk cutter and a lower shaft mounting a feed gear are separated by the can opener mechanism for insertion of the can rim prior to opening and then brought together in cutting relationship with the can rim therebetween, the improvement which resides in the cutter disk assembly comprising a cylindrical shaft, a cutter disk having a tapered bearing hole mounted thereon whereby the cutter is permitted a limited oscillatory movement about its shaft during the cutting operation to follow closely the internal contour of the can rim.

2. In a cutter assembly for can openers in which an upper shaft mounting a rotatable disk cutter and a lower shaft mounting a feed gear are separated by the can opener mechanism for insertion of the can rim prior to opening and then brought together in cutting relationship with the can rim therebetween, the improvement which resides in the cutter disk assembly comprising a tapered shaft, a cutter disk having a cylindrical bearing hole therethrough mounted on the shaft, said cutter closely fitted to the shaft at the head of the disk cutter and loosely fitted at the base whereby the cutter is permitted a limited oscillatory movement about its shaft during the cutting operation to follow closely the internal contour of the can rim.

3. In a cutter assembly for can openers in which an upper shaft mounting a rotatable disk cutter and a lower shaft mounting a feed gear are separated by the can opener mechanism for insertion of the can rim prior to opening and then brought together in cutting relationship with the can rim therebetween, the improvement which resides in a ball and socket bearing for mounting the disk cutter upon its shaft whereby the cutter is permitted a limited oscillatory movement about its shaft during the cutting operation to follow closely the internal contour of the can rim.

4. In a cutter assembly for can openers in which an upper shaft mounting a rotatable disk cutter and a lower shaft mounting a feed gear are separated by the can opener mechanism for insertion of the can rim prior to opening and then brought together in cutting relationship

with the can rim therebetween, the improvement which resides in an oscillaing or wobbly bearing for mounting a disk cutter upon its shaft, the shaft portion of said bearing having a cylindrical shape, the cutter portion having the shape of a truncated cone whereby the cutter is permitted a limited oscillatory movement on its shaft during the cutting operation to follow closely the internal contour of the can rim.

5. In a cutter assembly for can openers in which an upper shaft mounting a rotatable disk cutter and a lower shaft mounting a feed gear are separated by the can opener mechanism for insertion of the can rim prior to opening and then brought together in cutting relationship with the can rim therebetween, the improvement which resides in an oscillating or wobbly bearing for mounting the disk cutter upon its shaft, the cutter portion of said bearing having a cylindrical shape and the shaft portion having the shape of an inverted truncated cone.

6. In a cutter assembly for can openers in which an upper shaft mounting a rotatable disk cutter and a lower shaft mounting a feed gear are separated by the can opener mechanism for insertion of the can rim prior to opening and then brought together in cutting relationship with the can rim therebetween, the improvement which resides in the cutter disk assembly comprising a shaft, and a cutter disk mounted on the shaft for rotation, the cutter disk being closely fitted to the shaft at the head of the cutter disk and loosely fitted to the shaft at the base of the cutter disk whereby the cutter disk is permitted a limited oscillatory movement upon its shaft during the cutting operation to follow closely the internal contour of the can rim.

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