



This invention relates to a can opener.

A can opener of the type in which the can is opened by cutting through an outer part of the rim joining the lid with the main body of the can has been proposed in several references, in particular US4734986, US4782594, US2255641 US Re27,504, US4251917, US3094776, US2196182, US5121546 and inventor's US Patent No. 5181322 derived from PCT Publication no. W090/05108.

With such a can opener, the rim of the can is held between a drive wheel, which is rotatably connected to a handle for operation by a user, and a cutter wheel. Rotation of the drive wheel causes the drive wheel to move around the rim, with the cutter wheel cutting through the outer part of the rim thus separating the lid from the remainder of the can.

It is a disadvantage of a can opener of the kind disclosed in the aforementioned US Patent 5181322 and the other references that it is necessary to apply considerable force between the cutter wheel and drive wheel when these are engaged with the rim of the can to ensure an adequate cut and to advance the can opener around the can without slippage. This renders the can opener difficult to operate, particularly by those who are not so strong, such as the old or infirm. In inventor's prior US Patent No. 5181322, inventor proposed that the drive wheel be rotatably journaled within a metal sleeve supported by the body of the can opener, with the outer surface of the shaft and the inner surface of the sleeve mating at positions adjacent the ends of the sleeve so as to provide rotational support for the shaft and intermediate those positions a gap being provided between the outer surface of the shaft and the inner surface of the sleeve to avoid contact between the shaft and sleeve so as to reduce frictional forces upon rotation of the shaft relative to the sleeve. However, the inventor found that this did not resolve the problem and the can opener was still difficult to operate.

It is an object of the invention of alleviate this disadvantage and in accordance with the invention there is provided a hand-operated can opener having support means to which a cutter wheel engageable with the rim of a can and a drive wheel adapted to grip the rim on an opposed side to said cutter wheel are rotatably mounted, the drive wheel being connected to a handle for manual rotation of the drive wheel and cutter wheel around the can rim and wherein the spindle is rotatably mounted relative to the support means by means of at least one rolling bearing.

The inventor has found that the use of a rolling bearing, a bearing type not before, to the inventor's knowledge, used or associated with hand-operated kitchen implements provided a substantial reduction in operating difficulty for the can opener.

Preferably the rolling bearing is in the form of a needle roller bearing of length at least equal to its character or may comprise two roller bearings con-

tained in a single housing mounted in the body portion at spaced locations.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a side view of the cutting arrangement of a can opener being an embodiment of the invention.

Figure 2 is a view of an enlarged scale similar to figure 1 showing the cutter and drive wheels engaging the can.

Figure 3a is a cross sectional view of the drive wheel and spindle of figure 1 with figure 3b being a view in the direction a-a of figure 2a.

Figure 4 is a cross sectional view similar to figure 2a illustrating a second embodiment of the invention.

Figure 1 is a view similar to figure 12 of US 5181322 but illustrating an embodiment of the invention.

The full details of the general operation of the present embodiment of a can opener are disclosed in US Patent 5181322. Reference to this Patent is directed and the contents thereof are incorporated herein by reference.

As shown in figure 1, the can opener generally designated 10 comprises a support means formed from a pair of handles which are integrally formed with body portions 12 and 14 respectively. The body portions 12, 14 are pivoted to one another about a spigot 13 which is integral with the body portion 12 and which extends into a corresponding opening 15 in the body portion 14.

A spindle 16 passes through the spigot 13, the spindle being formed at one side with the drive wheel 18 which has on its outer face, serrations, teeth or the like to allow it to grip the inside of a rim 20 of a can 22 (fig 2) so that when rotated, the drive wheel 18 will drive the can opener 10 around the can 22 to be opened.

At the opposed end of the spindle 16 to the drive wheel 18, a crank handle 19 is provided by means of which the wheel 18 may be manually rotated. A washer 21 is provided between the handle 19 and the body portion 12.

Connected to the body portion 14 is an upstanding shaft 29 on which a cutter wheel 30 is idly and rotatably mounted. The cutter wheel 30 comprises a circular cutting edge 32 and an integral circular flange 34. The outer cylindrical face 36 of this is slightly larger diameter than the cutting edge 32 so that the face 36 can bear against an upright sidewall 38 of the can 22.

The cutter wheel 30 is held in place on the shaft 29 by an endcap 40 riveted or screwed to the shaft 29. Between the endcap 40 and the wheel 30 is a washer 42 of a resilient material. Washers 41 are provided on either side of the cutter wheel 30.

The axis 40 of the spindle 16 is offset from the axis 42 of the spigot 13. In this way, when the handles

are moved apart by pivoting the portions 12, 14 about the spigot, the drive wheel 18 is moved away from cutter wheel 30 and so can be placed over the rim of the can to be opened and conversely when the handles are brought together and grasp in the hand of a user, the drive wheel 18 is moved in closer to the cutter wheel 30 and engages the rim of the can guided by flange 34 to the position as shown in figure 2 in which the cutter edge engages the can rim which is held in the nip between cutter wheel 30 and drive wheel 18. Rotation of the handle 19 will cause the drive wheel 18 to grip the inside of the can rim thus forcing the cutter wheel around the rim, cutting the rim open as it goes as described in US Patent 5181322 (W090/05108).

The force necessary to maintain the cutter wheel 30 and drive wheel 18 in mutual contact with the rim 20 generates a radial frictional force between the spindle 16 and the spigot 13. As shown in figures 1 and 3a, in the embodiment of the invention hereindescribed, a rolling bearing 50 is provided between the spindle 16 and body portion 12, the bearing 50 having a housing 52 and a plurality of axially arranged needle rollers 54 running the length of the casing 52, to provide a substantially frictionless bearing arrangement. Preferably, the roller bearing has an axial length at least equal to its radial width and the bearing 50 is of an axial length substantially the same as the width of the region of the body portion 12 in which it is disposed, so as to provide a substantial degree of support.

As shown in figure 4 and in accordance with a second embodiment of the invention, the housing 52 accommodates first and second roller bearings 56, 58 disposed at opposed ends of the casing 52, with a packing member 60 being disposed between the bearings 56, 58.

The inventor has found that the use of a rolling bearing such as the needle roller bearing 50 (a choice of bearing arrangement to the inventor's knowledge never before used with a manually operated kitchen implement) substantially improves the operability of the device

A latitude of modification, change and substitution is intended in the foregoing disclosure and in some instances some features of the invention will be employed without a corresponding use of other features. Accordingly it is appropriate that the appended claims be construed broadly and in a manner consistent with the spirit and scope of the invention herein.

**Claims**

1. A hand operated can opener of the type in which a can is opened by cutting through an outer part of the rim joining the lid with the main body of the can, the opener having support means to which

a cutter wheel engageable with the rim of the can and a drive wheel arranged to grip the rim on an opposed side to said cutter wheel are rotatably mounted, the drive wheel being connected to a handle for manual rotation to drive the drive wheel and cutter wheel around the can rim and wherein the drive wheel is rotatably mounted on the support means by means of at least one rolling bearing.

2. A can opener as claimed in claim 1 wherein the drive wheel is mounted in relation to the support means by means of first and second said rolling bearings.
3. A can opener as claimed in claim 2 wherein the first and second rolling bearings are housed in a single housing.
4. A can opener as claimed in claim 2 or claim 3 wherein a separator is disposed between the first and second rolling bearings.
5. A can opener as claimed in claim 1 wherein the bearing is a roller bearing.
6. A can opener as claimed in claim 6 wherein the or each bearing is a needle roller bearing.
7. A can opener as claimed in claim 6 wherein the bearing is of an axial length at least equal to its diameter.
8. A can opener as claimed in any one of the preceding claims wherein the support means comprises a pair of handle integrally formed with portions pivoted to one another about a spigot, the drive wheel having a spindle passing through the spigot and the bearing being disposed between the spigot and spindle, the spigot having a mounting portion in which the bearing is disposed, the mounting portion defining a cavity extending substantially the width of the body portion and the bearing being disposed in said cavity.



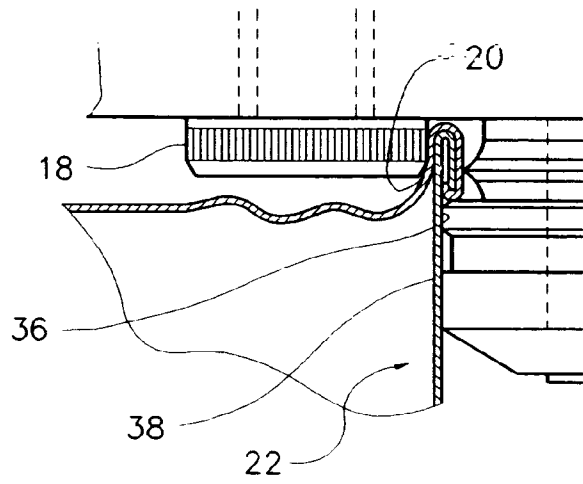


FIG. 2

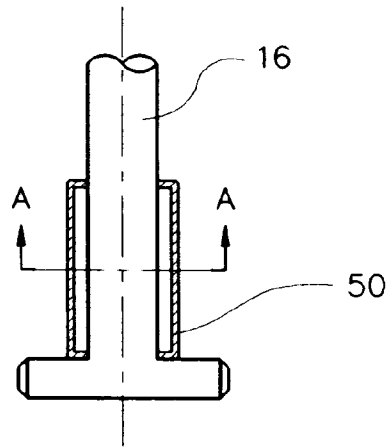


FIG. 3A

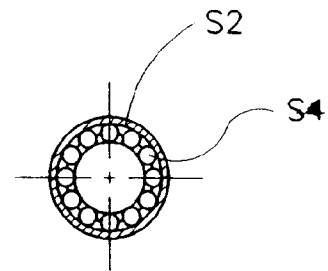


FIG. 3B

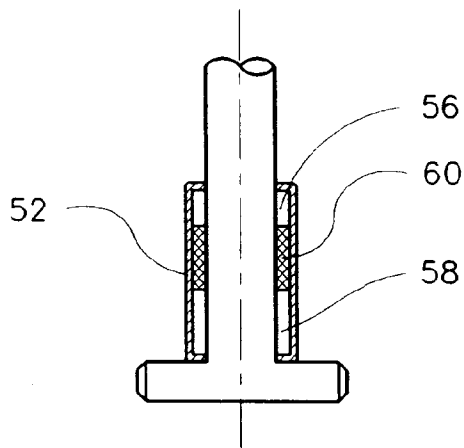


FIG. 4



European Patent  
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EUROPEAN SEARCH REPORT

Application Number

EP 93 30 4404

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-U-9 107 019 (KUNKE) * the whole document * ---	1-5	B67B7/72
Y,D	WO-A-9 005 108 (IBL PRODUCTS COMPANY LTD) * the whole document * ---	1,2,4,5,8	
Y	FR-A-2 064 553 (VEB FEUMA) * page 2, line 33 - line 34; figures 1,3 * -----	1,2,4,5,8	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B67B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 08 SEPTEMBER 1993	Examiner MARTINEZ NAVAR
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