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(54) **Bottle capsule cutter**

(57) Device for circumferentially cutting the protective caps fitted to the necks of bottles, this device (1) essentially comprising a handle (11) connected at one extremity to a forked part forming two branches (12) together forming a circular arc member (13) on the extremities of which are mounted corresponding arcuate members (2) pivoted on suitable pins (3) engaging at points which are at a slight distance from their centres so as to form corresponding short arms (22) facing the said circular arc member (13) and long arms (23) facing outwards, corresponding cutting wheels (4) being mounted on a flat transverse surface of the said arcuate members (2) at their extremities and projecting slightly

from the corresponding internal cylindrical surfaces and arranged in such a way that when the said arcuate members (2) are located in the closed position they (4) are equally spaced from each other and tangential to the minimum operating diameter, suitable edges (21) capable of engaging the extremity of the neck of the bottle in such a way as to support the said device (1) during the operating stage projecting directly towards the interior of the same (2) automatically and simultaneously ensuring proper and constant positioning of the said cutting wheels (4) on the length of the neck of the bottle.

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Description

[0001] This invention relates to a device for circumferentially cutting the end of protecting caps normally fitted to the ends of the necks of bottles.

[0002] It is known that on the extremity of the necks of bottles, particularly those used to contain wine, in addition to the normal stopper (generally of cork or substitutes) normally inserted to seal them, a protective coating is very frequently applied particularly to high quality bottles, usually comprising a metal cap, normally of suitable tinfoil, recently replaced by plastics or other suitable material, which covers the entire external surface of the stopper and also extends for some distance along the corresponding neck. This application, as is known, also performs the function of protecting the area so covered, as well as having a particular aesthetic function.

[0003] It would always be desirable to remove the aforesaid cap or at least the extreme end covering the stopper before removing the stopper, but this operation often proves rather difficult especially if carried out manually with only the help of unsuitable tools such as knives and the like.

[0004] It follows that this operation is frequently avoided and the stopper is extracted without having first removed the corresponding protective cap from the neck of the bottle, which is then merely torn away. This gives rise to a really irregular collar around the opening through which the liquid contained within exits, that is at the extremity of the neck of the bottle, formed by the irregular edges of the cap resulting from its tearing, and this clearly generates particular disadvantages of not only a hygienic but also functional nature.

[0005] In order to overcome these disadvantages various types of devices have been provided through which it is always possible to remove the protective cap by making a circumferential cut rationally, simply and quickly in the vicinity of its extremity in order to obtain a regular and uniform edge. All devices of this type almost always include cutting members such as simple sharpened blades or more often circumferentially sharpened wheels which are normally located in two pairs mounted in corresponding moving supports which are suitably spaced apart so that the part of the cap which has to be cut can be inserted between them. By working manually in this way to bring the said wheels (or sharpened blades) close together, that is so as to press the blades or wheels against the neck of the bottle in the area in which it is intended to make the cut in the corresponding protective cap, and rotating the entire unit on which they are hinged by quite a small amount in opposite directions, a complete circumferential cut is obtained around the cap which leaves a perfectly regular and uniform edge. In the various known forms of such devices the cutting members, that is normally the said blades or wheels applied are in fact usually mounted in pairs on two corresponding arms which are connected together in various ways. In the arrangement preceding use,

these arms are positioned at a suitable distance from each other so that the corresponding cutting members are at some distance from the external surface of the protective cap which they must then engage and cut.

This positioning will be controlled manually if the said arms are interconnected, them usually being freely hinged or pivoting with respect to each other, that is in such a way that they can freely move with respect to each other and in many cases this is instead brought about through the action of moving them apart caused through the inclusion of suitable resilient means or an appropriate overall resilient conformation of the corresponding supporting member.

[0006] All the various devices of the type in question which are known have various disadvantages and limitations in both function and use. Operation is almost always rather complex and difficult, and in most instances does not permit action on the necks of bottles of different sizes, only a few making it possible to operate on the necks of bottles having dimensions which differ only slightly.

[0007] The object of this invention is to overcome the abovementioned disadvantages and limitations and this is achieved through the device in question of which a preferred embodiment is described in detail in order to provide a better understanding of the features and advantages which may be achieved therewith, purely by way of example and without restriction, with reference to the appended drawing in which:

- Figure 1 shows the device to which this invention relates with a view of the side which is inserted onto the extremity of the neck of the bottle on which it has to operate,
- Figure 2 is a lateral view of Figure 1,
- Figure 3 is a view equivalent to Figure 1 which however includes a part which is suitably cut away to reveal the shape and arrangement of some of its internal parts,
- Figure 4 is a cross-section view along the line I-I in Figure 1 which is suitably rotated to show the device engages the end of the neck of a bottle which for clarity is indicated by a dashed line,
- Figure 5 is a cross-section view along the line II-II again in Figure 1, but rotated for the same reasons as in Figure 4 above,
- Figure 6 diagrammatically illustrates the arrangement of the moving members of the device in the position of use in the case where it is used on the necks of bottles of small diameter,
- Figure 7 illustrates use of the device on the necks of bottles having a large diameter in the same way

as in Figure 6,

- Figure 8 is a perspective view of the device showing the same part as in Figure 1, that is the part which is inserted onto the extremity of the neck of the bottle on which it is intended to operate.

[0008] In these figures common references are identified using the same reference numbers, and in Figure 6, in order to clarify the relative position of the circle representing the neck of the bottle and the moving parts of the device, these are shown by a thin line in the stage preceding their use while a thick line indicates their positions when in use.

[0009] With reference therefore to these figures it will be seen that as a whole device 1 comprises a generic handle 11 which terminates at one extremity in a forked portion having two branches 121 which are effectively defined by a circular arc section 13. This circular arc section 13 has an internal diameter which is slightly larger than the diameter of the collar which normally projects from the neck of a conventional bottle close to the extremity thereof and an external diameter which is obviously desirably greater, and has over its entire length a rectangular recess 131 in such a way that lateral branches 12 effectively form corresponding lengths having a "C" cross-section forming corresponding lateral projections 132. The extremities of these lateral projections 132 terminate in corresponding attached semicircular parts 133 at the centre of which they are pivoted on suitable pins 3, two arcuate members 2 having a circular shape and with a transverse rectangular cross-section which is equal to the width of said rectangular recess 131 within which they partly penetrate. These arcuate members 2 then extend over a distance equal to that of the said circular arc distance 13 for which the relative internal and external radiuses of curvature are equivalent to those defined correspondingly by the internal and external diameter of the said circular arc section 13. A protecting edge 21 of small thickness extending over a particular width, whose function will be described below, also extends at right angles from one extremity of the inert circular surfaces of each of the said arcuate members 2 and returns towards the internal surface thereof (2), that is towards their centre of curvature O. It is pointed out that, in respect of what is stated above, the diameter defining the internal radius of the said arcuate members 2 will be approximately 27 mm and the height of the same (2) will instead be approximately 8 mm, this value being determined by the height of the length of the neck of the bottle which extends from the extremity of the said neck to the adjacent edge of the collar normally projecting therefrom, a value which is normally approximately 6 mm and to which must be added the thickness produced by the said projecting edge 21 which in the experimental embodiment to which reference is made was 2 mm.

[0010] As may be clearly seen particularly from Fig-

ures 1 and 3, said arcuate members 2 extend over a distance sufficient to contain cutting wheels 4 close to their respective extremities which are suitably pivoted thereon (2) in such a way that when these (2) are located in the minimum opening position illustrated in Figures 1 and 3 they are equally spaced apart and in practice positioned at the corners of a square centered on the same centre O which is common to the radiuses of curvature of the two (2). Obviously said cutting wheels 4 are applied to flat transverse surfaces opposite to those from which corresponding projecting edges 21 extend, as described above, and also project somewhat (at least the thickness of the cap which has to be cut) from the respective internal circular surfaces of corresponding arcuate members 2. As may be clearly seen particularly in Figures 1, 3, 6 and 7, these arcuate members 2 are not pivoted on the corresponding centres but on a point which is slightly offset therefrom. This consequently results in two arms, specifically a short arm 22 and a long arm 23, the first of which, short arm 22, is located on circular arc section 13 more specifically, as may be clearly seen in particular from Figure 3, in rectangular recess 131 in the latter (13), while the second, long arm 23, extends beyond the semicircularly connected extremities 133 of the two branches 12 of that circular arc section 13. Also the corresponding pivot axes of these arms 22 and 23 on the corresponding extremities of aforesaid branches 12 (that is the axes of pins 3) are slightly offset towards the inside of the corresponding fork forming the said circular arc section 13, in practice, as may be clearly seen from Figures 1 and 3 and diagrammatical figures 6 and 7, they are located at a distance of approximately 5 mm from the transverse axis passing through the centre O which coincides with the cross-section line II-II in Figure 1.

[0011] The aforesaid displacement of the axis of rotation of arcuate members 2 makes it possible, as may particularly be seen in Figure 7, to achieve a slight increase in the opening of the same, that is in the maximum useful operating distance resulting between the corresponding free ends. At this point it is neither useful nor necessary to describe in detail the resulting closer conformation of the external part of the said arms 21 in that this is obvious and can clearly be seen in particular from Figures 1 and 3, and which is not shown in diagrammatical figures 6 and 7, as this is unnecessary for an understanding of them.

[0012] Now that the conformation of the individual constituent members of device 1 in question and their mutual arrangement and composition has been described in detail, the practical use of device 1 will be briefly described.

[0013] By first grasping the handle of device 1 the two arcuate members are positioned with respect to each other by separating or bringing together their free extremities by hand so as to adjust them to the diameter of the neck of the bottle on which it is intended to operate.

[0014] The bold line in Figures 6 and 7 indicate the minimum and maximum diameters at which the device can be operated respectively.

[0015] After said arcuate members 2 have been suitably positioned as described above, device 1 is applied to the extremity of the neck of a corresponding bottle locating it in such a way that the terminal length of that neck penetrates within the internal surfaces of arcuate members 2 and that its terminal surface, that is the extremity sealed by the stopper and covered by the thickness of the protective cap, impacts against the internal surfaces of projecting edges 21 which, as described, extend from corresponding arcuate members 2. This initial arrangement is clearly illustrated in Figure 6, in which arcuate members 2, which are spaced apart as described above, and the circle representing the neck of the bottle on which the operation is being performed are indicated with a thin dashed line. Device 1 is then pressed against the neck of the bottle which, as may be clearly seen in Figure 6, first impacts against the internal extremities of arcuate members 2. Continuing the pressure the neck of the bottle causes rotation of the said arcuate members 2 about the corresponding pins 3 on which they are pivoted, by pressing on those extremities. Consequently these internal extremities with the two corresponding cutting wheels 4 move away from each other and progressively penetrate rectangular recess 131 provided within circular arc section 13. At the same time the free extremities, that is the external extremities of said arcuate members 2, will obviously be pushed towards each other so as to cause corresponding cutting wheels 4 to impact against the neck of the bottle. It follows that, as may be clearly seen in Figure 6, the neck of the bottle is virtually clamped between the four cutting wheels 4. Clearly the intensity of this clamping will increase as the thrust against the neck exerted by the operator on device 1 is increased. At this point it is sufficient to rotate the entire device 1 around the neck of the bottle in opposite directions to ensure that cutting wheels 4 make a complete circumferential cut around the protective cap, the upper part of which is thus detached from the remainder which remains adhering to the neck of the bottle and can finally be removed leaving a perfectly regular and uniform edge.

[0016] From what has been stated it is clear and obvious that the device to which this invention relates, in addition to making it possible to achieve a perfect cut, which can also be achieved with known similar devices, above all makes it possible to operate in a much more convenient, simple, functional and rational manner than when using the same.

[0017] It must also be pointed out that in addition to being capable of being used alone this device may also advantageously be applied as a useful and convenient accessory to other tools, for example, such as is already the case for other similar devices, to stopperscrews of the pocket type.

[0018] In conclusion it should be understood that a

number of variants may be made to the device in question without thereby going beyond the scope of what has been described and claimed below with reference to the appended drawing and therefore beyond the scope of the protection of this industrial property.

Claims

1. Device for circumferentially cutting the protective cap applied to the necks of bottles, this device (1) being **characterised in that** it essentially comprises a handle (11) which is connected at one extremity to a forked portion forming two branches (12) which as a whole form a circular arc member (13) to the extremities of which are fitted corresponding arcuate members (2) pivoted on suitable pins (3) engaging at points at a slight distance from their centres so as to form corresponding short arms (22) facing the said circular arc member (13) and long arms (23) facing outward on a flat transverse surface of the said arcuate members (2) with corresponding cutting wheels (4) being mounted on their extremities and projecting slightly from the corresponding internal cylindrical surfaces and arranged in such a way that when the arcuate members (2) are in the closed position they (4) are equally spaced from each other and are tangential to the minimum operating diameter, from the terminal edge of the internal circular surface coinciding with that defined by the opposite second flat surface, with suitable edges (21) projecting directly towards the interior of the same (2) and capable of engaging the extremity of the neck of the bottle in such a way as to support the said device (1) during the operating stage automatically and simultaneously ensuring proper and constant positioning of the said cutting wheels (4) on the length of the neck of the bottle.
2. Device according to the preceding claim **characterised in that** the said circular arc member (13) extends over a distance which is somewhat less than a semi-circle and has a rectangular transverse cross-section of a "C" shape thus having internally a corresponding recess (131) which is also rectangular and capable of containing the corresponding parts of the said arcuate members (2) pivoted on the extremities thereof (13).
3. Device according to the preceding claims **characterised in that** in order to cut the terminal part of the said protective cap the operator seizes the handle (11) of the said device (1) and after manually performing automatic adjustment of the mutual positioning of the corresponding arcuate members (2) places it on the extremity of the neck of the bottle being operated on in such a way that the terminal part of the latter penetrates between the internal cir-

cular surfaces of the said arcuate members (2) causing the surface of its terminal extremity to impact against the surfaces of their (2) corresponding projecting edges (21), and then pushes the entire device (1) against the neck of the bottle which engaging with the said short arms (22) of the corresponding arcuate members (2) causes those arcuate members (2) to rotate about the corresponding pivoting pins (3) thus causing the corresponding long arms (23) to impact against the said neck of the bottle which is thus clamped between the corresponding four cutting wheels (4), and finally rotates the whole in a conventional way about the said neck of the bottle so that the said cutting wheels (4) produce a uniform circumferential cut about the protective cap thus making it possible for the terminal part of the same to be removed with consequent exposure of the stopper beneath it.

4. Device according to the preceding claims **characterised in that** it may comprise an independent tool or may be advantageously fitted to a suitable extremity of another tool in common use such as preferably a known stopperscrew of the pocket type, the handle of which in this case also constitutes the handle (11) of the device itself (1).

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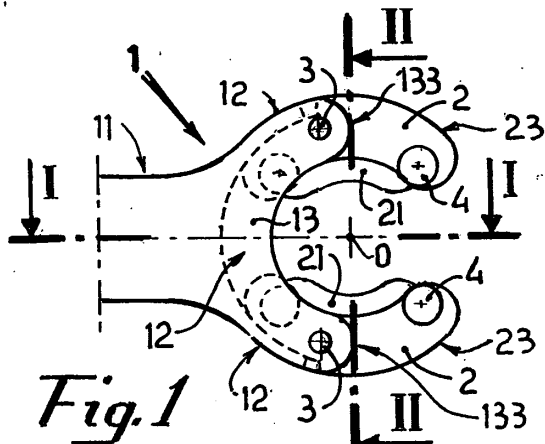


Fig. 1

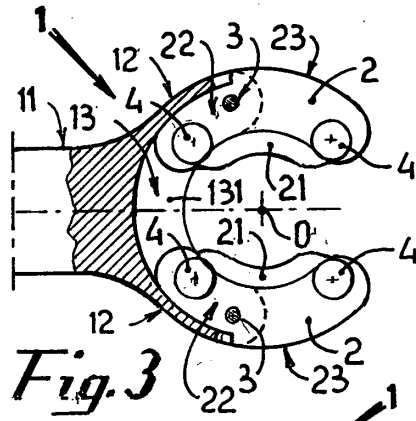


Fig. 3

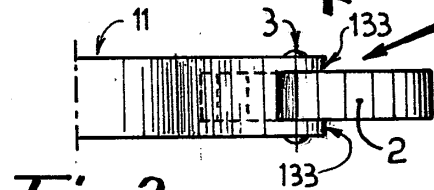


Fig. 2

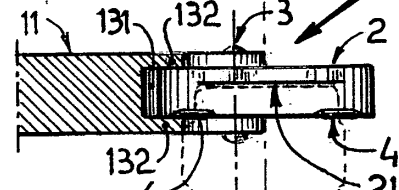


Fig. 4

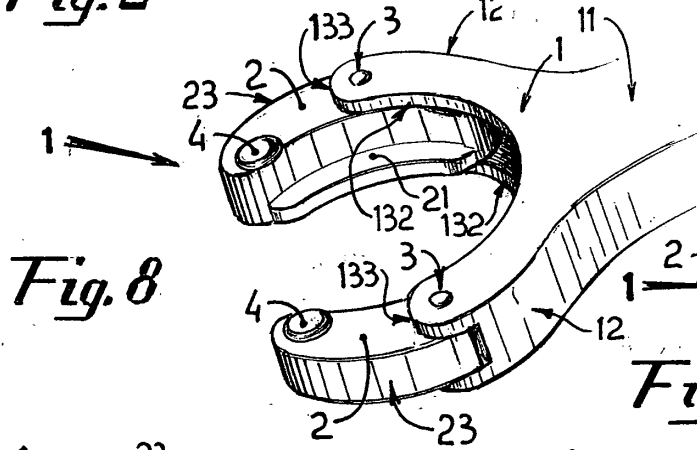


Fig. 8

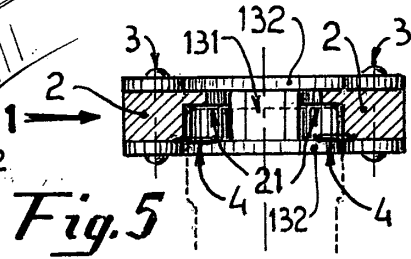


Fig. 5

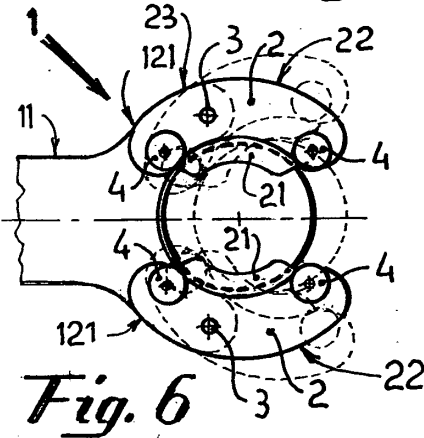


Fig. 6

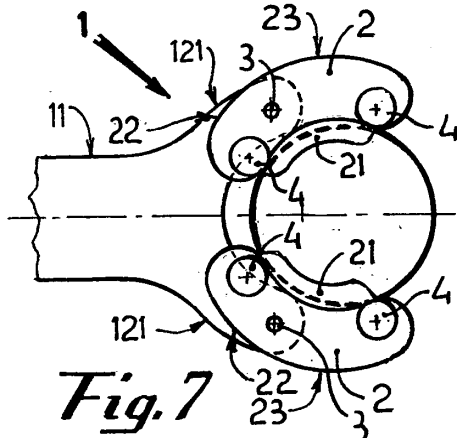


Fig. 7



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EUROPEAN SEARCH REPORT

Application Number
EP 05 07 5470

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		24 May 2005	Martínez Navarro, A.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 05 07 5470

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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