

The opinion in support of the decision being entered today was **not** written for publication and is **not** precedent of the Board.

Paper No. 48

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CONSUMER CAP CORPORATION

Appeal No. 2001-0315
Control No. 90/004,592¹

ON BRIEF

Before FRANKFORT, McQUADE and BAHR, Administrative Patent Judges.

BAHR, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 13, 14 and 16. Claims 11, 12, 15, 17, 19, 22 and 23, the only other claims pending in this proceeding, have been indicated as patentable by the examiner.

¹ Reexamination of U.S. Patent No. 5,553,727, issued September 10, 1996, based on Application 08/430,019, filed April 27, 1995.

Appeal No. 2001-0315
Control No. 90/004,592

BACKGROUND

The appellant's invention relates to a tamper-evident cap. An understanding of the invention can be derived from a reading of independent claim 13, which reads as follows:

13. A tamper-evident cap comprising:

a. a closure member at a first end with a depending annular wall around the periphery of said closure member, said annular wall having an internal surface;

b. a tamper-evident band circumferentially positioned around a second end of said depending annular wall;

c. a first annular ring flange positioned around said [internal surface of said depending annular wall] tamper-evident band; and

d. at least ten threads spaced apart and helically positioned on said internal surface of said annular depending wall between said first annular ring flange and said closure member and each of said threads extending less than 90° around said surface and having a lead-in adjacent said first annular ring flange to permit snapping [on] said cap [to] onto a neck finish.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Ryder	4,756,438	Jul. 12, 1988
Repp et al. (Repp)	5,593,055	Jan. 14, 1997
		(filed Mar. 16, 1994)

The following rejection is before us for review.

Appeal No. 2001-0315
Control No. 90/004,592

Claims 13, 14 and 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ryder in view of Repp.

Reference is made to the brief and reply brief (Paper Nos. 44 and 46) and the answer (Paper No. 45) for the respective positions of the appellant and the examiner with regard to the merits of this rejection.

OPINION

In arriving at our decision on the obviousness issues raised in this appeal, we have given careful consideration to the appellant's specification and claims, the teachings of the applied prior art references, the declaration of Luca Molinaro² dated January 20, 1998 (part of Paper No. 14), and the respective positions articulated by appellant and the examiner. Having reviewed all of the evidence before us, we make the determinations which follow.

We note, at the outset, that appellant's brief states, at page 5, that claims 13, 14 and 16 "stand independently of each other." However, as appellant has chosen to argue the patentability of the claims without regard to any particular

² Mr. Molinaro is the inventor of the patent which is the subject of this reexamination proceeding.

Appeal No. 2001-0315
Control No. 90/004,592

claim, we shall consider each of the appellant's arguments based on representative claim 13, with claims 14 and 16 standing or falling therewith. See In re Wiseman, 596 F.2d 1019, 1021-1022, 201 USPQ 658, 660 (CCPA 1979); In re Burckel, 592 F.2d 1175, 1178-1179, 201 USPQ 67, 70 (CCPA 1979); In re Hellsund, 474 F.2d 1307, 1309-1310, 177 USPQ 170, 172 (CCPA 1973).

Ryder discloses a container 1 having a cylindrical neck 2 with a "two-start thread 4" and an optionally continuous external bead 3 for retaining a tamper-proof ring of a suitable closure. The bead 3 is provided on its underside with a projection 5 in the form of a relatively wide arcuate bulge. The closure 6 comprises a cap portion 7, provided with closure threads 13, and an integrally-molded tamper-evident ring 8 joined to the cap by thin frangible plastic bridges 9 equiangularly spaced around the circumference of the cap. As illustrated in Figure 5, the tamper-evident ring has a radially inwardly extending bead 10 with an upper coaxial surface 10a which is very shallowly inclined to the horizontal and a lower conical surface 10b which is much more steeply inclined to the horizontal and therefore readily rides over

Appeal No. 2001-0315
Control No. 90/004,592

the bead 3 and bulge 5 on the neck 2 of the container as the closure 6 is being screwed onto the neck. As the closure is screwed down by engagement of the closure threads 13 with the neck threads 4, the relatively steeply inclined (shallowly conical) ramp surface 10b on the underside of the bead 10 of the tamper-evident ring 8 rides over the outwardly projecting tamper-evident bead 3 of the neck. The elasticity of the tamper-evident ring is sufficient to allow this movement and to cause the bead to snap back into place underneath the bulge 5 when the cap portion 7 has been screwed fully home. When the cap portion 7 is unscrewed it begins to rise and immediately the part of the inwardly projecting bead 10 of the tamper-evident ring which is directly below the bulge 5 has its part of the upper surface 10a in contact with the bulge 5 exerting a force tending to pull the tamper-evident ring 8 locally away from the cap portion 7. As each frangible bridge 9 comes into register with the bulge 5 upon rotation of the closure 6, the lifting force of the cap portion 7 causes the bridge 9 to break, separating the cap portion from the tamper-evident ring. See column 2, line 18, to column 3, line 32.

Appeal No. 2001-0315
Control No. 90/004,592

Repp discloses a container having a neck and a snap-on, screw-off cap including a cap skirt and a tamper-evident band. The cap and neck are provided with mating threads of such shape that the cap may be applied in a simple downward vertical movement without relative rotation, the cap skirt flexing sufficiently to permit the threads to slip past each other. The interengagement of the threads requires that the closure be unscrewed for removal from the container (column 2, lines 51-58). The container neck 22 is provided with threads 29. The shape of the threads 29 permits the threads on the interior of the cap to slip past and interengage the threads 29 of the neck. Preferably, the thread apex 30 is made with as large a radius as possible, allowing direct axial application of the cap while requiring the cap to be unscrewed and not pulled from the neck (column 4, lines 34-40). The interior of the cap skirt 53 is provided with threads 56 selected to mate with the threads 29 of the neck 22, with the shape of the threads 29 and 56 allowing the threads to slip past one another and then interengage (column 5, lines 17-21). While the illustrated embodiment comprises multilead threads 29 and 56 having seven leads and linear thread density of

Appeal No. 2001-0315
Control No. 90/004,592

approximately 17.5 threads per inch, with each neck thread 29 extending 215° of the neck circumference and each cap thread 56 extending approximately 180° around the cap circumference, Repp points out that "it is to be understood that the length of the threads, number of leads, and thread density may be subject to considerable variation (column 5, lines 32-35).

Repp further teaches that

[i]n order for the closure and container threads to effectively slip past each other during direct axial application, the threads must be finer than those of a threaded closure applied by conventional rotary application. As threads become finer, a greater amount of total thread engagement is often necessary to prevent excessive forward stripping on reapplication. A total thread engagement of approximately 1190° is satisfactory for the embodiment illustrated in FIGS. 1-9 where the multilead threads 56 are formed with a thread density of 17.5 threads per inch, although it is to be understood that the total thread engagement may be increased or decreased as desired. If the thread density is decreased, the total thread engagement required to prevent excessive forward stripping would be less than with the embodiment of FIGS. 1-9. For example, 400° of total thread engagement would be satisfactory for a linear thread density of twelve turns per inch [column 5, lines 37-53].

The closure 6 of Ryder meets the limitations of paragraphs a through c of claim 13, with the cap portion 7, tamper-evident ring 8 and radially inwardly extending bead 10

Appeal No. 2001-0315
Control No. 90/004,592

responding, respectively, to the closure member and depending annular wall, the tamper-evident band and the first annular ring flange recited in the claim. The closure threads 13 do not meet the limitations of paragraph d of claim 13. However, the examiner asserts that "[t]o form the Ryder container neck and closure with any number of threads, i.e., 10 or more, and to extend them less than 90 degrees, given the specific teaching[s] of Repp, would have been obvious to one of ordinary skill in the art" (answer, page 4). According to the examiner, the selection of the number and length of the threads would merely involve the discovery of an optimum value of a result effective variable, which has been held to involve only routine skill in the art.

Appellant (brief, page 6) argues that Ryder is not analogous art with respect to appellant's invention, because Ryder is a screw-on cap and not a snap-on cap. For the reasons which follow, we do not agree with appellant in this regard.

Two criteria have evolved for determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if

Appeal No. 2001-0315
Control No. 90/004,592

the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. In re Clay, 966 F.2d 656, 658-59, 23 USPQ2d 1058, 1060 (Fed. Cir. 1992). See also In re Deminski, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed. Cir. 1986); In re Wood, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979).

We recognize that Ryder is disclosed as being a screw-on, screw-off closure. However, as set forth in column 1, lines 5-8, of appellant's patent, appellant's invention "relates to a neck finish particularly well suited for blow-molded containers and to novel snap-on snap-off caps which are screw-on screw-off and have a tamper-evident locking feature." Moreover, appellant's claims are directed to a "tamper-evident cap." Thus, from our perspective, the field of appellant's invention is tamper-evident caps and corresponding neck finishes for containers, the same field of endeavor in which Ryder is involved. Even accepting that appellant's invention is more particularly directed to a tamper-evident cap having the feature that it may be snapped onto the container, we are satisfied that one of ordinary skill in the art would have

Appeal No. 2001-0315
Control No. 90/004,592

recognized this feature as an improvement over the screw-on screw-off cap, in that it eliminates from the application process the complexity of having to turn the cap relatively to the container, as evidenced by Repp (column 2, lines 26-30), rather than as defining a different field of endeavor. Thus, Ryder qualifies as analogous art under the first established criterion. Moreover, even if Ryder were considered to be from a different field of endeavor than appellant's invention, both appellant's invention and Ryder address the problem of providing a tamper-evident cap which, once applied, cannot be removed from the neck of the container without separation from its tamper-evident ring. Accordingly, Ryder is reasonably pertinent to the problem solved by appellant and, thus, qualifies as analogous art under the second criterion as well.

Appellant also argues that, even if Ryder is analogous art with respect to appellant's invention, it would not have been obvious to one of ordinary skill in the art to combine Ryder with the teachings of Repp, which is a snap-on screw-off cap, because Ryder is a screw-on cap, not a snap-on cap (brief, page 7). In particular, appellant asserts that the

Appeal No. 2001-0315
Control No. 90/004,592

Ryder cap encounters completely different types of forces during installation and removal that would not enable its use with a snap-on closure and that the Ryder tamper-evident band would not remain intact during an initial snap-on installation (brief, pages 7 and 8). Appellant relies on the Molinaro declaration to support appellant's position regarding the infeasibility of applying features from a screw-on cap design to a snap-on cap design (brief, page 8).

Turning first to appellant's argument that the teachings of the references are not combinable because Ryder is directed to a screw-on cap and Repp is directed to a snap-on cap, we note that Repp recognizes that snap-on screw-off structures have several advantages not found with screw-on screw off systems, one of which is the elimination of the need for turning or rotating the cap relative to the container until the closure is fully seated (column 2, lines 26-30). Additionally, in a screw-off arrangement, the frangible connections between the tamper-evident band and the closure must be sufficiently strong to prevent partial separation when the cap is twisted onto the container, thereby leading to the possible result that the consumer will often have difficulty

Appeal No. 2001-0315
Control No. 90/004,592

removing the closure (column 2, lines 30-37). On the other hand, Repp also teaches that having partial to full thread engagement after the application of a closure helps eliminate consumer confusion (column 1, lines 50-53). These teachings of Repp would have suggested to one of ordinary skill in the art modification of the closure and neck threads of Ryder in the manner disclosed by Repp to achieve both the advantages of a snap-on system and the advantages of partial to full thread engagement after a snap-on installation. More specifically, Repp would have instructed one of ordinary skill in the art to select the length, number (and corresponding number of lead-ins) and density of the threads so as to optimize the total thread engagement while still permitting the closure and container threads to slip past each other during direct axial application (column 5, lines 36-53) in order to achieve these advantages. Therefore, while neither Ryder nor Repp expressly discloses the use of at least ten threads each extending less than 90° around the internal surface of the cap as recited in claim 13, we share the examiner's view that the prior art would have suggested to one of ordinary skill in the art the kind of optimization of Ryder's threads necessary to achieve

Appeal No. 2001-0315
Control No. 90/004,592

the particular thread structure recited in claim 13. This accords with the general rule that discovery of optimum values of result effective variables is ordinarily within the skill of the art. See In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980) and In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

The Molinaro declaration (page 4) takes issue with the examiner's position that the specifically claimed number of threads (at least 10) amounts to mere discovery of an optimum value of a result effective variable.³ Specifically, declarant points out that the seven-thread cap disclosed in declarant's earlier U.S. Patent No. 5,307,946 failed to produce better results than those with fewer threads and still required torque to make it leak proof. In contrast, according to declarant, "the cap claimed in the '727 patent [U.S. Patent No. 5,553,727, the subject of this reexamination proceeding]

³ In considering declarant's statement that "I am not aware of any prior art that teaches that the number of threads is a result effective variable," it is important to note that the Molinaro declaration was made prior to the first citation or application of either the Ryder or Repp patent by the examiner. There is no indication in the declaration, which discusses numerous prior art references applied earlier in this reexamination proceeding but no longer applied, that declarant was aware of either the Ryder or Repp patent at the time the declaration was made.

Appeal No. 2001-0315
Control No. 90/004,592

performs exceptionally well and has a significantly growing application in marketplace" (declaration, page 4).

As stated in In re Huang, 100 F.3d 135, 139, 40 USPQ2d 1685, 1688 (Fed. Cir. 1996):

This court and its predecessors have long held, however, that even though applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within the capabilities of one skilled in the art, unless the claimed ranges "produce a new and unexpected result which is different in kind and not merely in degree from the results of the prior art."

Additionally, as stated in In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990):

The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. . . . These cases have consistently held that in such a situation, the applicant must show that the particular range is *critical*, generally by showing that the claimed range achieves unexpected results relative to the prior art range [citations omitted].

In the present case, however, appellant has not established that the claimed number of threads or thread length produces unexpected results. In this regard, while the Molinaro declaration states that the claimed cap "performs exceptionally well," declarant has provided insufficient

Appeal No. 2001-0315
Control No. 90/004,592

details from which it can be established that (1) any improvement in performance was due to the specifically claimed number and length of cap threads, rather than, for example, differences in the shape of the threads or characteristics of either the container neck or cap material⁴ and (2) the improvement constitutes a new and unexpected result which is different in kind and not merely in degree from the results of the prior art.

Moreover, an appellant relying on comparative tests to rebut a prima facie case of obviousness must compare his claimed invention to the closest prior art. In re De Blauwe, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984). We note that the superior results discussed in the Molinaro declaration are with respect to the cap disclosed in appellant's prior patent, not the caps of the prior art (Ryder and Repp) applied by the examiner.

⁴ It is well settled that evidence of nonobviousness must be commensurate in scope with the claims to which it pertains. In re Clemens, 622 F.2d 1029, 1035, 206 USPQ 289, 296 (CCPA 1980); In re Dill, 604 F.2d 1356, 1361, 202 USPQ 805, 808 (CCPA 1979) and In re Tiffin, 448 F.2d 791, 792, 171 USPQ 294, 294 (CCPA 1971). See also In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 778 (Fed. Cir. 1983).

Appeal No. 2001-0315
Control No. 90/004,592

With regard to appellant's argument that a cap encounters different types of forces during installation and removal, depending on whether such installation or removal is of the snap-on (off) type or screw-on (off) type, we appreciate that the selection of a snap-on structure may involve different design considerations as compared with a screw-on structure and that one of ordinary skill in the art would not casually combine structural features of the two types without regard to these considerations (see Molinaro declaration, page 2). However, we find nothing in the teachings of the applied references or in the Molinaro declaration which would suggest that the Ryder closure, and the tamper-evident band in particular, would be incapable of withstanding the forces of a snap-on installation, if modified as taught by Repp, or that it would have been viewed as such by one of ordinary skill in the art at the time of appellant's invention. On the contrary, Repp suggests that the frangible connections of a tamper-evident band may need to be stronger in a screw-on installation than in a snap-on installation (column 2, lines 30-34). Moreover, Ryder's tamper-evident ring 8 is described as being sufficiently elastic to allow movement of the bead 10

Appeal No. 2001-0315
Control No. 90/004,592

on the tamper-evident ring over the outwardly projecting bead 3 on the neck and to cause the bead 10 to snap back into place underneath the bulge 5 when the cap portion has been screwed fully home (column 3, lines 1-7). In light of this description, one of ordinary skill in the art would have expected the tamper-evident ring 8 of Ryder to be sufficiently flexible to withstand the forces of a snap-on installation and would have had a reasonable expectation of success in modifying the threads to permit a snap-on application to achieve the advantages taught by Repp.⁵

Finally, with regard to appellant's argument on page 7 of the brief that Ryder specifically teaches away from a tamper-evident band with ratchets, we note that Ryder (column 1, lines 36-55) points out the disadvantages of a ratchet type tamper-evident ring and prefers the inventive tamper-evident bead arrangement (neck bead 3 and projection/bulge 5 and tamper-evident bead 10) to such a ratchet type arrangement.

⁵ Obviousness does not require absolute predictability. Only a reasonable expectation that the beneficial result will be achieved is necessary to show obviousness. In re Merck & Co., Inc., 800 F.2d 1091, 1097, 378 USPQ 375, 379 (Fed. Cir. 1986).

Appeal No. 2001-0315
Control No. 90/004,592

However, even if appellant is correct that Ryder teaches away from a ratchet type tamper-evident ring, any such teaching away is of no moment in the obviousness consideration at issue, in that the examiner has not proposed that Ryder be modified to incorporate a ratchet type tamper-evident band. That Repp discloses such a tamper-evident band does not, in our opinion, render the teachings of Repp as a whole per se inapplicable to Ryder.

After reviewing all of the evidence before us, including the Molinaro declaration, it is our conclusion that, on balance, the evidence of nonobviousness fails to outweigh the evidence of obviousness discussed above and, accordingly, the subject matter of claim 13 would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103 at the time the appellant's invention was made. See Richardson-Vicks Inc. v. Upjohn Co., 122 F.3d 1476, 1483, 44 USPQ2d 1181, 1187 (Fed. Cir. 1997).

Accordingly, we shall sustain the examiner's rejection of claim 13, as well as claims 14 and 16 which fall therewith, under 35 U.S.C. § 103 as being unpatentable over Ryder in view of Repp.

Appeal No. 2001-0315
Control No. 90/004,592

CONCLUSION

To summarize, the decision of the examiner to reject claims 13, 14 and 16 under 35 U.S.C. § 103 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

CHARLES E. FRANKFORT)	
Administrative Patent Judge)	
)	
)	
)	
)	BOARD OF PATENT
JOHN P. McQUADE)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
JENNIFER D. BAHR)	
Administrative Patent Judge)	

Appeal No. 2001-0315
Control No. 90/004,592

For the patent owner:

THOMAS C. WETTACH
COHEN & GRIGSBY, P.C.
11 STANWIX STREET, 15TH FLOOR
PITTSBURGH, PA 15222

For the requester:

THOMAS J. EDGINGTON
KIRKPATRICK & LOCKHART
1500 OLIVER BUILDING
PITTSBURGH, PA 15222