Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte RONALD K. GROOTERS

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Appeal No. 2000-0908
Application No. 08/763,728

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ON BRIEF

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Before FRANKFORT, STAAB, and McQUADE, *Administrative Patent Judges.*

STAAB, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal from the final rejection of claims 1-5, 7, 9-11 and 15-20, all the claims currently pending in the application.

Appellant's invention pertains to an aortic cannula (claims 1-5, 7, 9, 10 and 15-19) having one or more openings that are oriented such that, in use, blood may be directed

toward the ascending aorta and away from the aortic arch. Appellant's invention also pertains to a method of providing blood to the aorta (claim 11), and a method of cannulization for heart by-pass surgery (claim 20). A further understanding of the invention can be derived from a reading of representative claims 1 and 11, which appear in the appendix to appellant's main brief (Paper No. 14).

The references relied upon by the examiner as evidence of obviousness are:

Fecht	4,795,446	Jan. 03, 1989
Cosgrove et al. (Cosgrove)	5,643,226	Jul. 01, 1997 (filed Oct. 6, 1994)

Claims 1-5, 7, 9-11 and 15-20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Fecht in view of Cosgrove.

Reference is made to appellant's main and reply briefs (Paper Nos. 14 and 18) and to the examiner's answer (Paper No. 17) for the respective positions of appellant and the examiner regarding the merits of this rejection.

Looking first at claim 1, this claim is directed to an

aortic cannula comprising an elongated tube having a terminal end with forward and rearward surfaces, at least one opening in the rearward surface, the forward surface being closed "to prevent blood flow in the direction of the aortic arch," and an inverted cup at the terminal end for deflecting the flow of blood exiting the cannula rearwardly.

Fecht discloses an aortic cannula comprising an elongated tube having a tip, shown in the cross section in Figure 7, comprising a generally elliptical opening 65 provided in a sidewall of the tip. The tip also includes a smoothly curved wall 74 extending between the inner wall of the cannula and the distal end of the opening so that blood flowing distally in lumen 70 flows into the tip, against the smoothly curved wall, and out the opening 65 with minimal turbulence even though there is a substantial change in the direction of the blood flow. Column 3, line 64 through column 4, line 5.

Cosgrove is directed to an aortic cannula designed to overcome the problems associated with high velocity "jet" flow emanating from the distal end of an aortic cannula. As explained by Cosgrove at column 1, lines 23-36, the high

velocity “jet” flow of blood can cause atheromatous material and/or adherent thrombi from the walls of the aorta to dislodge, causing embolisms. Cosgrove’s solution to this problem involves the provision of a cap 30 at the distal end of the cannula to substantially block the axial flow of blood and redirect it in a more radial direction (column 3, lines 41-48). Particularly preferred by Cosgrove is the provision of a land 42 at the distal end 40 of the cannula. The following quote from column 4, line 66 through column 5, line 16, of Cosgrove’s specification illustrates the perceived advantages of diverting the flow of blood to a more radial and less axial direction:

> The blood flow encounters the rounded, blunt distal end **40** of the lumen which redirects the flow axially in the proximal direction. When the axial distal flow encounters the rebounding proximal flow, the bulk of the distal flow is diverted radially outwardly through the outlet openings in a sheet-like cone. Thus, rather than a jetting, axial flow experienced with conventional aortic cannula, the cannula **20** and **20**’ provide a diffused flow that more quickly establishes a stable, more uniform velocity blood flow in the aorta. The flow properties of the blood are such that the cannula creates an “umbrella” flow pattern, as shown in FIGS. **8** and **9**, that more quickly establishes a uniform flow in the aorta.

> The cannulas **20** and **20**’ of this invention thus reduce maximum flow velocity, the variation in flow velocity, and the maximum flow force, while maintaining the overall flow rate. These reductions are believed to be significant in the reduction of thrombo-atheroembolisms, and other possible complications of heart surgery.

In rejecting claim 1 as being unpatentable over Fecht in view of Cosgrove, it is the examiner’s position that Fecht discloses an aortic cannula that corresponds to the aortic cannula called for in the claim except perhaps for a clear disclosure of an inverted cup at the terminal end of the cannula. The examiner considers, however, that it would have been obvious to one of ordinary skill in the art “to modify Fecht by providing the inverted cup of Cosgrove et al. at the terminal end [of Fecht’s cannula] in order to improve the deflection of the blood flow outwardly as shown by Cosgrove et al.” (answer, pages 4-5). Implicit in the rejection is the examiner’s position that the modified cannula of Fecht would correspond structurally to the cannula set forth in claim 1 in all respects.

The positions taken by the examiner in rejecting claim 1 are well founded. In particular, we are in agreement with the examiner’s bottom line position that (1) it would have been

obvious to modify the distal end of Fecht's cannula to direct the flow of blood in a more radial and less axial direction to gain the advantages set forth in Cosgrove (i.e., more diffused blood flow that reduces "jet" flow and thus decreases the chances of thrombi from dislodging from the walls of the aorta), and the examiner's bottom line position that (2) the modified Fecht cannula would result in the subject matter of claim 1.

Concerning (2), appellant argues (main brief, page 7) that Fecht's cannula and manner of use are precisely the opposite of that which is claimed. More specifically, appellant contends that, in contrast to appellant's cannula, Fecht's cannula has an opening in the forward facing surface of the cannula and no opening in the rearward facing surface of the cannula, and that, in use, Fecht's cannula is positioned with the forward (open) sidewall facing the aortic arch and the rearward (closed) sidewall facing the ascending aorta. While we appreciate that Fecht's Figure 1 appears to show the cannula thereof positioned in the aorta with the opening in the tip facing the aortic arch, appellant's argument is not well taken with respect to claims such as

claim 1 that are directed to the cannula *per se*.

It is generally well settled that the particular manner in which a device or article is intended to be used cannot be relied on to distinguish a claimed structure from the prior art. *See In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990); *In re Yanush*, 477 F.2d 958, 959, 177 USPQ 705, 706 (CCPA 1973); *In re Casey*, 370 F.2d 576, 580, 152 USPQ 235, 238 (CCPA 1967). *Also note In re Schreiber,* 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997), and *LaBounty Mfg., Inc. v. United States Int'l Trade Comm'n*, 958 F.2d 1066, 1075, 22 USPQ2d 1025, 1032 (Fed. Cir. 1992). In that the cannula of Fecht reasonably appears to be fully capable of directing blood flow into the ascending aorta and away from the aortic arch, claim 1 does not distinguish over Fecht's cannula on the basis of the intended use recited in the claim. Furthermore, appellant's attempt to distinguish the subject matter of claim 1 over Fecht on the basis of "forward" and "rearward" designations for the closed and open sides, respectively, is misplaced. The structure of appellant's cannula does not undergo a metamorphosis to a new

cannula structure distinct from the cannula structure of Fecht merely because appellant chooses to denominate the open side of the cannula as the "rearward" surface and the closed side of the cannula as the "forward" surface of the cannula's terminal end.

We do *not* agree with appellant's contention on page 3 of the reply brief that "the forward and rearward surfaces of the cannula are defined with respect to the ascending aorta and aortic arch." From our perspective, appellant's article claims do not define any relationship between the cannula and the anatomy of the heart that the cannula of Fecht would be incapable of achieving. We also note appellant's argument on pages 8-9 of the main brief that the examiner has failed to provide the requisite motivation or suggestion for the proposed combination, and that Fecht teaches away from the proposed combination; however, we simply disagree with appellant in this regard. We therefore shall sustain the standing § 103 rejection of claim 1, as well as claims 2-5 that depend therefrom and have not been separately argued.

We shall also sustain the standing § 103 rejection of

claims 7, 9, 10 and 15-19, all of which are directed to the cannula *per se*, as being unpatentable over Fecht in view of Cosgrove. As to claim 7, the claim language calling for "the forward surface being free from openings" does not distinguish over the cannula of Fecht for the reasons discussed above. Concerning claim 15, the modified Fecht cannula would have an "inverted cup" at the end thereof. In the matter of claim 17, the intended use recitation therein calling for an opening "oriented so as to direct blood from the tube outwardly only in the direction of the ascending aorta" does not distinguish over the applied prior art because Fecht's cannula reasonably appears to be capable of functioning as claimed. As to the requirement of claim 16 that the inverted cup has "an apex angle of at least 10E," we agree with the examiner that this feature appears to be met by Cosgrove's distal end 40. See, for example, the inner peripheral wall of Cosgrove's distal end 40 as illustrated in Figure 6B. In any event, in that appellant's specification states on page 4 that an apex angle of between about 10E and about 45E is merely preferred, we consider that an apex angle of at least 10E for the inverted cup, as called for in claim 16, is merely a matter of

engineering design choice and thus does not serve to patentably distinguish the claimed invention over the prior art.[1] *See In re Kuhle*, 526 F.2d 553, 555, 188 USPQ 7, 8-9 (CCPA 1975).

We shall not sustain the standing rejection of method claims 11 and 20 as being unpatentable over Fecht in view of Cosgrove. Claim 11 positively recites the step of preventing blood flow from the cannula in the direction of the aortic arch, and claim 20 positively recites the step of orienting the opening in the terminal end of the cannula away from the aortic arch such that blood is directed only toward the ascending aorta. The examiner has not explained, and it is not apparent to us, where these positively recited steps are taught or suggested by the applied prior art. Accordingly, the standing rejection of these method claims cannot be sustained.

In summary, the rejection of claims 1-5, 7, 9-11 and 15-

[1]Since the range of apex angles covered by claim 16 includes angles in excess of 45E, in the event of further prosecution the examiner may wish to consider whether appellant's original disclosure provides 35 U.S.C. § 112, first paragraph, descriptive support for this limitation.

20 as being unpatentable over Fecht in view of Cosgrove is affirmed with respect to claims 1-5, 7, 9, 10 and 15-19, but is reversed with respect to claims 11 and 20.

The decision of the examiner is affirmed-in-part.

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

AFFIRMED-IN-PART

CHARLES E. FRANKFORT Administrative Patent Judge	)	
LAWRENCE J. STAAB Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JOHN P. McQUADE Administrative Patent Judge	)	

LJS:hh

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