

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 41

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARKUS FLEISCHLI, FELIX STREIFF and ANDREAS WALDER

Appeal No. 1997-0863
Application 08/456,001

ON BRIEF

Before CALVERT, FRANKFORT, and BAHR, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 14 and 22 through 29. Claims 15 and 16 have been objected to by the examiner as being dependent upon a rejected base claim, and have been indicated to be allowable subject to being rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 17 through 21 have been canceled.

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Claims 30 and 31, the only other claims pending in this application, were not rejected by the examiner in the final rejection, however, appellants' brief (Page 2, Paper No. 29, filed September 9, 1996) indicates an assumption that these claims are rejected. The examiner's answer (Paper No. 30, page 4) includes claims 30 and 31 in the rejection under 35 U.S.C. § 102(b). Thus, it is our view, and apparently that of appellants and the examiner, that claims 1 through 14 and 22 through 31 are before us on appeal.

Appellants' invention relates to a static mixer for thoroughly and efficiently mixing two or more fluids of varying viscosities. Claims 1, 9, 14, 25, 26 and 29 are representative of the subject matter on appeal and a copy of those claims is appended to this decision.

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

Fredriksson et al. (Fredriksson) 4,861,165 Aug. 29,
1989

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Miyata
1983 (Japanese Kokai)¹

58-133823

Aug. 9,

Claims 1 through 3, 22 and 25 through 31 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Miyata.

Claims 4 through 14, 23 and 24 stand rejected under 35 U.S.C. § 103 as being unpatentable over Miyata in view of Fredriksson.

Claims 1, 9 and 14 stand rejected under 35 U.S.C. § 112, first paragraph, as being directed to a specification which, as originally filed, does not support the invention as now claimed. More particularly, the examiner urges that claims 1, 9 and 14 all recite "...cross-sectional flow areas... taken generally perpendicular to the direction of flow through said respective mixers...", without support in the specification.²

¹Our understanding of this foreign language document is based on a translation prepared for the U.S. Patent and Trademark Office. A copy of that translation is attached to this decision.

² This is a new ground of rejection added in the examiner's answer and further clarified in the supplemental examiner's answer (Paper No. 36, page 2) as being applicable "specifically to claims 1, 9 and 14." While the examiner has

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Rather than reiterate the examiner's statement of each of the above-noted rejections and the conflicting viewpoints advanced by the examiner and appellants regarding those rejections, we refer to the examiner's answer (Paper No. 30, mailed October 2, 1996) and to the supplemental examiner's answer (Paper No. 36) for the examiner's reasoning in support of the rejections and to the brief (Paper No. 29, filed September 9, 1996) and reply brief (Paper No. 33) for appellants' arguments to the contrary.

OPINION

In arriving at our decision in this appeal, we have carefully considered appellants' specification and claims (both as originally filed and as amended), the applied

urged that this rejection is based on the "make and use" provision of 35 U.S.C. § 112, first paragraph (answer, page 7), it is apparent to us from the explanation of the rejection that it is instead based on lack of written description, and we will so treat the rejection for purposes of this appeal. We further observe that the examiner has not specifically included claims dependent from claims 1, 9 and 14 in the rejection, although they would generally be subject to the same ground of rejection as the independent claim.

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references, and the respective positions of the examiner and appellants regarding the issues before us on appeal. As a consequence of our review, we have made the determinations which follow.

Turning first to the examiner's rejection of claims 1, 9 and 14 under 35 U.S.C. § 112, first paragraph, we note that the test for determining compliance with the written description requirement of the first paragraph of § 112 is whether the disclosure of the application as originally filed reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter. See In re Kaslow, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983). In this regard, it is important to additionally understand that the claimed subject matter does not have to be expressed in ipsis verbis in the specification in order to satisfy the description requirement of §112 (see In re Wertheim, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976)) and that, under appropriate circumstances, the original drawings alone may be sufficient to provide the required

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"written description of the invention." See Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991); In re Wolfensperger, 302 F.2d 950, 956, 133 USPQ 537, 542 (CCPA 1962).

With this as our background, we turn to the examiner's characterization of the recitation in the claims on appeal regarding the cross-sectional flow area of the first and second mixers being "taken generally perpendicular to the direction of flow through said respective mixers...", as being without support in the specification. While the examiner is correct in observing that appellants' original specification does not expressly indicate that the cross-sectional flow areas of the first and second mixers are taken generally perpendicular to the direction of flow through said respective mixers, we find that we are in agreement with appellants' arguments on pages 2 and 3 of the reply brief that these claims only recite that which one skilled in the art would have viewed as being apparent (inherent) from the original disclosure of appellants' application. Accordingly, it is our

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determination that appellants' disclosure as originally filed would have reasonably conveyed to the artisan that the inventors had possession of the now claimed subject matter at the time of filing of the present application. Thus, the examiner's rejection of claims 1, 9 and 14 under 35 U.S.C. 112, first paragraph, as lacking support in the originally filed disclosure will not be sustained.

Next, we turn to the prior art rejection of claims 1 through 3, 22 and 25 through 31 under 35 U.S.C. 102(b) as being anticipated by Miyata. As is by now well settled, an anticipation under 35 U.S.C. 102 is established when a single prior art reference discloses, either expressly or under

principles of inherency, each and every element of a claimed invention. See RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 221 USPQ 385 (Fed. Cir. 1984).

Looking first at independent claim 1, we note that this

claim defines a static laminar mixing device wherein the device includes, inter alia, a first mixer having "a predetermined cross-sectional flow area" and a second mixer "having a cross-sectional flow area that is greater than said cross-sectional flow area of said first mixer." While appellants urge that this relationship is not taught or disclosed in Miyata (brief, pages 9-17), we do not agree. Looking at Figure 7 of Miyata, we note that the cross-sectional flow area of the first mixer (1a) is generally equal to the cross-sectional area of the interior flow channel of that mixer minus the cross-sectional area of the shaft body (10). By comparison, the cross-sectional flow area of the second mixer (1b), at least at the inlet opening (6) and outlet (7), appears to be equal to the cross-sectional area of the interior flow channel of the mixer (1a). Thus, at the inlet opening (6) and outlet (7) of the second mixer, the cross-sectional flow area of the second mixer (1b) is "greater than said cross-sectional flow area of said first mixer." We note in this regard, that claim 1 does not specify any particular location where the cross-sectional flow area of the

second mixer is greater than the cross-sectional flow area of the first mixer, or that the cross-sectional flow area of the second mixer is greater than the cross-sectional flow area of the first mixer along its entire length.

Appellants have additionally urged (brief, page 17) that claim 1 on appeal requires the second mixer to have a plurality of static mixer elements "disposed along a longitudinal axis thereof," and that the second mixer in Miyata lacks such an arrangement because the disks (16, 17) therein are not mixer elements, but diverter plates, and the mixing elements of Miyata (small chambers 15) are arranged not along a longitudinal axis of the second mixer, but laterally thereto, in a radial direction. We also find this argument to be unpersuasive. In the first place, given the redirection of flow created by the unit bodies (14) of the disks (16, 17) as seen in Figures 1 and 7 of Miyata and the creation of flow passageways (19) defined by disks (17), we view the plurality of disks (16, 17) of Miyata as broadly being mixer elements "disposed along a longitudinal axis" of the second mixer.

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Moreover, even if only the small chambers (15) are viewed as the mixer elements in Miyata, we note that sets of the small chambers (15) associated with each pairing of disks (16, 17) can be viewed as being "mixer elements" and that a plurality of such mixer elements are "disposed along a longitudinal axis" of the second mixer (1b), i.e., so that the mixer (1b) of Miyata has six sets of such "mixer elements" disposed along the longitudinal axis thereof. Thus, we do not see that this limitation in claim 1 in any way distinguishes over the mixing device of Miyata.

Given the foregoing, we must agree with the examiner that the static mixing device of appellants' claim 1 on appeal is anticipated by the static mixing device of Miyata. Accordingly, the examiner's rejection of claim 1 under 35 U.S.C. § 102(b) as being anticipated by Miyata is sustained.

Regarding claims 2, 3, 22 and 30 which depend from claim 1, we note that appellants have grouped claims 2, 3 and 22 along with claim 1, while claim 30 has been grouped separately

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(See Paper No. 32). As a result of their grouping with claim 1, we

view claims 2, 3 and 22 as falling with independent claim 1 and will therefore also sustain the examiner's rejection of claims 2, 3 and 22 under 35 U.S.C. § 102(b) as being anticipated by Miyata.

Claim 30 adds the further limitation to claim 1 that the cross-sectional flow area of the second mixer is greater than the cross-sectional flow area of the first mixer "over the entire length of the second mixer." Since we do not find any such disclosure or teaching in Miyata, we will reverse the examiner's rejection of this claim under 35 U.S.C. § 102(b) as being anticipated by Miyata.

Independent claims 25 and 29 are similar to claim 30 in that they each set forth, in slightly different language, that

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the second mixer has a substantially constant cross-sectional flow area over its length which is greater than the cross-sectional flow area of the first mixer. Appellants urge on pages 7 and 8 of their reply brief that Miyata does not disclose, teach or suggest a second mixer with the required constant cross-sectional flow area over the length of the mixer. We agree, and for that reason will not sustain the examiner's rejection of claims 25 and 29 under 35 U.S.C. § 102(b) as being anticipated by Miyata.

The last of the claims rejected by the examiner under 35 U.S.C. § 102(b) as being anticipated by Miyata are claims 26 through 28 and 31. Independent claim 26 defines a static laminar mixing device comprising a first mixer defined by an elongated first tubular conduit that includes a plurality of static mixer elements serially arranged along a longitudinal axis thereof, the first tubular conduit has a given cross-section defining a cross-sectional flow area therethrough, and the static mixer elements of the first mixer are specifically set forth as "extending across the entire cross-sectional flow

area." Claim 26 also requires a second mixer defined in language similar to that mentioned above regarding the first mixer and specifically requires that a cross-sectional flow area for the media through the mixer elements in the second conduit (second mixer) be greater than the cross-sectional flow area for the media through the first conduit (first mixer). On page 17 of the brief and page 10 of the reply brief, appellants assert that Miyata does not have mixing elements which extend across the entire cross-sectional flow area of the conduits as required in claim 26, and for that reason does not anticipate appellants' claimed subject matter. At least with regard to the first mixer (1a) of Miyata, we must agree with appellants that none of the mixer elements of the unit bodies (8a, 8b) extend across the entire cross-sectional flow area of the conduit. Accordingly, Miyata does not disclose or teach, either expressly or under principles of inherency, each and every element of the claimed invention, and for that reason we will not sustain the examiner's rejection of claim 26 under 35 U.S.C. § 102(b) as being anticipated by Miyata.

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Since claims 27, 28 and 31 depend from claim 26 and include all of the limitations thereof, it follows that these claims are likewise not anticipated by Miyata. We also further note that claim 31 adds the requirement that the cross-sectional flow area for the media through the mixer elements in the second conduit is greater than the cross-sectional flow area for the media through the first conduit "over the entire length of the second conduit," a limitation which is also not found in Miyata.

The next rejection for our consideration is that of claims 4 through 14, 23 and 24 under 35 U.S.C. § 103 as being unpatentable over Miyata in view of Fredriksson. In this instance, the examiner has taken the position (answer, page 6) that it would have been obvious to one of ordinary skill in the art

to provide to the admixing means of Miyata a convergent plate, as suggested by Fredriksson et al. in order to provide a means through which the second medium passes through prior to entering the static mixing means.

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Appellants urge (brief, pages 18-20) that one skilled in the art would not consider combining Fredriksson and Miyata as posited by the examiner and that the examiner's attempt to combine these references in such a manner is nothing more than a hindsight reconstruction of the prior art based on the disclosure of the present application. In addition, appellants contend that Fredriksson does not teach or suggest the specific form of admixing device set forth in dependent claim 4 and independent claims 9 and 14 on appeal.

While we are in agreement with appellants' assessment of the examiner's proposed combination of Miyata and Fredriksson, in that we see no teaching or suggestion in these references for carving out only the initial section (i.e., ring member 15 and the first module 21) of the mixer in Fredriksson and attempting to modify the admixing portion (20) of the mixer (1a) of Miyata to include such components, we nonetheless will sustain the examiner's rejection of claims 4 through 13 and 23 on the basis of the combined teachings of Miyata and Fredriksson, but not the rejection of claims 14 and 24 on that

same basis. In this regard, with respect to claims 4 through 13 and 23, we are of the opinion that in light of the collective teachings of Miyata and Fredriksson it would have been obvious to one of ordinary skill in the art to replace the first mixer (1a) of Miyata with the mixer (13) of Fredriksson so as to achieve the intimate mixing and high degree of uniformity in the mixture discussed in Fredriksson (e.g., col. 2, lines 18-37 and col. 4, line 45, et seq.), thereby achieving the desired active premixing discussed in Miyata (translation, page 4) prior to the discharge of the pre-mixed fluids into the main mixer (1b) thereof. In our opinion, the person of ordinary skill in the art would have retained the relative cross-sectional flow areas taught by Miyata by having the mixer from Fredriksson sized to be no larger in cross-section than the mixer (1a) of Miyata.

Contrary to appellants' position, we view the first module (21) of Fredriksson (Fig. 2) as being "a plate transverse to the flow of the first medium and having at least one convergent orifice [24] therein for passage of a first

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medium therethrough" and consider that the duct (19) of Fredriksson constitutes "a duct adjacent said plate for passage of the second medium therefrom into said orifice," as broadly set forth in dependent claim 4 and independent claim 9 on appeal. We reach this conclusion because appellants' own disclosure of the "orifice plate" (24), seen in Figure 2 of the application drawings, includes a cylindrical projecting portion that, at least in-part, defines the convergent orifice in the "plate," and is therefore similar to the cylindrical "plate" or module (21) at the beginning of the mixer in Fredriksson (Fig. 2).

In light of the foregoing, we will sustain the rejection of claims 4 and 9 under 35 U.S.C. § 103 based on the collective teachings of Miyata and Fredriksson. As to claims 5 through 8, 10 through 13 and 23, we note that appellants have presented no separate arguments as to the patentability of these additional dependent claims, and that we, therefore, consider those claims to fall with claims 4 and 9 from which they depend.

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Because our reasoning in affirming the above-noted rejection of claims 4 through 13 and 23 is substantially different than that relied upon by the examiner in the final rejection

(Paper No. 25) and the answer (Paper No. 30), we denominate our affirmance of these claims as a new ground of rejection under 37 CFR 1.196(b).

With regard to independent claim 14, we observe that this claim includes a requirement for "a plate disposed transversely of a first flow of flowable medium, said plate having at least one convergent orifice [24] for passage of the first flow of medium therethrough" and also for "a duct coaxial of said orifice of said plate for expelling a second flow of flowable medium into said convergent orifice for mixing with the first flow downstream of said plate." Again, for the same reasons as set forth above, we view the combination of Miyata and Fredriksson as posited by the

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examiner to be flawed and to constitute merely a hindsight reconstruction of Miyata so as to arrive at appellants' claimed subject matter. Accordingly, the examiner's rejection of independent claim 14 under 35 U.S.C. § 103, and of dependent claim 24, will not be sustained.

Moreover, even with our own understanding of the collective teachings of these applied references and their combination as we have articulated above, we view the subject matter of appellants' claim 14, and claim 24 which depends therefrom, as being unobvious. Nothing in Miyata or Fredriksson teaches or suggests a duct for the introduction of the second flow of flowable medium wherein the duct is "coaxial of said orifice of said plate for expelling a second flow of flowable medium into said convergent orifice for mixing with the first flow downstream of said plate," as is seen in Figure 2 of the application drawings (duct 22) and as set forth in claim 14 on appeal. In this regard, we observe that the second flow of flowable medium (air) enters the distributor chamber (17) of Fredriksson from the duct (19)

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tangentially thereto and is mixed or swirled together with the first flowable medium in chamber (17) before its entry into the converging orifice (24). Unlike the examiner, we do not view the distributor chamber (17) of Fredriksson as being readable on the "duct" required in appellants' claim 14.

In light of the foregoing, the decision of the examiner rejecting claims 1, 9 and 14 under 35 U.S.C. § 112, first paragraph, is reversed. The examiner's decision rejecting claims 1 through 3, 22 and 25 through 31 under 35 U.S.C. 102(b) based on Miyata is affirmed as to claims 1 through 3 and 22, but is reversed as to claims 25 through 31. The decision of the examiner rejecting claims 4 through 14, 23 and 24 under 35 U.S.C. § 103 as being unpatentable over Miyata in view of Fredriksson, is affirmed as to claims 4 through 13 and 23, but reversed as to claims 14 and 24. As we noted above, our affirmance of the rejection of claims 4 through 13 and 23 based on the collective teachings of Miyata and Fredriksson is denominated as a new ground of rejection under 37 CFR 1.196(b), since our rationale is substantially different than

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that relied upon by the examiner in the final rejection and the answer.

In addition to affirming the examiner's rejection of one or more claims, this decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b) (amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63,122 (Oct. 21, 1997)). 37 CFR § 1.196(b) provides, "A new ground of rejection shall not be considered final for purposes of judicial review."

Regarding any affirmed rejection, 37 CFR § 1.197(b) provides:

(b) Appellant may file a single request for rehearing within two months from the date of the original decision
37 CFR § 1.196(b) also provides that the appellants,

WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of proceedings (37

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CFR § 1.197(c)) as to the rejected claims:

(1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .

(2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

Should the appellants elect to prosecute further before the Primary Examiner pursuant to 37 CFR § 1.196(b)(1), in order to preserve the right to seek review under 35 U.S.C. §§ 141 or 145 with respect to the affirmed rejections, the effective date of the affirmance is deferred until conclusion of the prosecution before the examiner unless, as a mere incident to the limited prosecution, the affirmed rejections are overcome.

If the appellants elect prosecution before the examiner

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and this does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejections, including any timely request for reconsideration thereof.

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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; 37 CFR § 1.196(b)

IAN A. CALVERT)	
Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
CHARLES E. FRANKFORT)	
Administrative Patent Judge)	APPEALS AND
)	
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)	
JENNIFER D. BAHR)	
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APPENDIX

1. A static laminar mixing device comprising

a first mixer having a predetermined cross-sectional flow area, an inlet for receiving at least a first flow of high viscosity medium, and plurality of static mixer elements disposed along a longitudinal axis thereof for mixing media of different viscosities together;

an admixing device for introducing a second flow of low viscosity medium into said inlet of said first mixer; and

a second mixer connected with said first mixer for receiving media therefrom, said second mixer having a cross-sectional flow area that is greater than said cross-sectional flow area of said first mixer, wherein said cross-sectional flow areas of said first and second mixers are taken generally perpendicular to the direction of flow through said respective mixers, said second mixer including a plurality of static mixer elements disposed along a longitudinal axis thereof for receiving and mixing the media of different viscosities together.

9. A static laminar mixing device comprising

a first mixer having an inlet for receiving at least a first flow of high viscosity medium and a plurality of static mixer elements disposed along a longitudinal axis thereof for mixing media of different viscosities together, said first mixer having a predetermined cross-sectional flow area;

an admixing device for introducing a second flow of low

viscosity medium into said inlet of said first mixer, said admixing device including a plate transverse to the flow of the first medium and having at least one convergent orifice therein for passage of the first medium therethrough into said first mixer and a duct adjacent said plate for passage of the second medium therefrom into said orifice; and

a second mixer connected with said first mixer for receiving media therefrom, said second mixer having a cross-sectional flow area that is greater than said cross-sectional flow areas of said first mixer, wherein said cross-sectional flow area of said first and second mixers are taken generally perpendicular to the direction of flow through said respective mixers, said second mixer including a plurality of static mixer elements disposed along a longitudinal axis thereof for receiving and mixing the media of different viscosities.

14. A static laminar mixing device comprising

a plate disposed transversely of a first flow of flowable medium, said plate having at least one convergent orifice for passage of the first flow of medium therethrough;

a duct coaxial of said orifice of said plate for expelling a second flow of flowable medium into said convergent orifice for mixing with the first flow downstream of said plate;

a first mixer having a predetermined cross-sectional flow area, an inlet for receiving said first and second flows, and a plurality of static mixer elements disposed along a longitudinal axis thereof; and

a second mixer connected with said first mixer for receiving media therefrom, said second mixer having a cross-sectional flow area that is greater than said cross-sectional flow area of said first mixer, wherein said cross-sectional

flow areas of said first and second mixers are taken generally perpendicular to the direction of flow through said respective mixers, said second mixer including a plurality of static mixer elements disposed along a longitudinal axis thereof.

25. A static laminar mixing device comprising

a first mixer having a predetermined cross-sectional flow area, an inlet for a flow of a high viscosity medium and a plurality of static mixer elements located along a longitudinal axis of the first mixer;

an admixing device for introducing a flow of a low viscosity medium into the first mixer; and

a second mixer in flow communication with a downstream end of the first mixer for receiving the flows from the first mixer, the second mixer having a substantially constant, cross-sectional flow area over its length which is greater than the cross-sectional flow area of the first mixer, the second mixer including a plurality of static mixer elements serially arranged between an inlet and an outlet of the second mixer for mixing the received media.

26. A static laminar mixing device comprising

a first mixer defined by an elongated first tubular conduit having an inlet, an outlet and a plurality of static mixer elements serially arranged along a longitudinal axis of the first tubular conduit for mixing media having different viscosities, the first tubular conduit having a given cross-section defining a cross-sectional flow area therethrough, the static mixer elements extending across the entire cross-sectional flow area;

an admixing device for introducing a second flow of a low viscosity medium into the first tubular conduit; and

a second mixer defined by an elongated, second tubular conduit having an inlet in flow communication with the outlet of the first tubular conduit, an outlet and a cross-section which is greater than the given cross-section, and a plurality of static mixer elements arranged longitudinally over a length of the second conduit and extending across the entire cross-sectional area of the second conduit so that a cross-sectional flow area for the media through the mixer elements in the second conduit is greater than the cross-sectional flow area for the media through the first conduit.

29. A static laminar mixing device comprising first and second tubular mixing conduits joined end-to-end for axially flowing fluid media to be admixed from an inlet of the first conduit to an outlet of the second conduit, the first and second conduits having first and second cross-sectional flow areas bounded by interior wall surfaces of the respective conduits which are substantially constant over respective lengths for the conduits, the second cross-sectional flow area being greater than the first cross-sectional flow area, a plurality of first and second static mixing elements serially arranged over the lengths of the first and second conduits, respectively, each static mixing element extending transversely to the axes of the conduits over the entire cross-sectional flow area of the respective conduits; and means for introducing the fluid media to be mixed into the first housing upstream of the second housing.³

³We understand the "first housing" and the "second housing" to be the first conduit and the second conduit as recited earlier in the claim. This issue is deserving of correction during any further prosecution of the application before the examiner.