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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SHERRI M. NELSON, DAVID W. EASTEP
and TIMOTHY A. REGAN

Appeal 2019–002614
Application 14/509,821
Technology Center 1700

BEFORE JEFFREY B. ROBERTSON, JAMES C. HOUSEL, and
JANE E. INGLESE, *Administrative Patent Judges*.

ROBERTSON, *Administrative Patent Judge*.

DECISION ON APPEAL¹
STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant appeals from the Examiner’s decision to reject claims 32–52.² Appeal Br. 1. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ This Decision includes citations to the following documents: Specification filed October 8, 2014 (“Spec.”); Non-Final Office Action mailed February 9, 2018 (“Non-Final Act.”); Appeal Brief filed July 25, 2018 (“Appeal Br.”); and Examiner’s Answer mailed December 13, 2018 (“Ans.”).

² We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Ticona LLC. Appeal Br. 1.

CLAIMED SUBJECT MATTER

Appellant states the invention relates to a profile and a method for forming a pultruded hollow profile including a consolidated ribbon containing continuous fibers embedded within a first thermoplastic matrix, the profile also containing a plurality of long fibers. Spec. ¶¶ 4, 5. Claim 32, reproduced below, is illustrative of the claimed subject matter (Appeal Br. 8, Claims Appendix):

32. A method for forming a hollow profile that extends in a longitudinal direction, the method comprising:
- impregnating a plurality of continuous fibers with a thermoplastic matrix within an extrusion device;
 - consolidating the impregnated fibers to form a first ribbon in which the continuous fibers are oriented in the longitudinal direction;
 - pultruding the first ribbon and a plurality of long fibers through a die to form the hollow profile, wherein the long fibers are provided to the die separately from the first ribbon such that the pultruding step occurs after the consolidating step.

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Zhou et al. (hereinafter “Zhou”)	US 2007/0125301 A1	June 7, 2007
Shirai et al. (hereinafter “Shirai”)	US 5,534,210	July 9, 1996
Yokota et al. (hereinafter “Yokota”)	US 5,266,139	November 30, 1993
Tong	US 5,174,844	December 29, 1992
Edwards	US 2007/0243368 A1	October 18, 2007

REJECTIONS

1. The Examiner rejected claims 32–34 and 37–43 under 35 U.S.C. § 103 as obvious over Zhou and Shirai.
 2. The Examiner rejected claim 35 under 35 U.S.C. § 103 as obvious over Zhou, Shirai, and Yokota.
 3. The Examiner rejected claim 36 under 35 U.S.C. § 103 as obvious over Zhou, Shirai, and Tong.
 4. The Examiner rejected claims 44–52 under 35 U.S.C. § 103 as obvious over Zhou, Shirai, and Edwards.
- Non-Final Act. 3–9.

Rejection 1

Appellant does not present separate arguments with respect to the claims. Appeal Br. 6. We select claim 32 as representative for disposition of this rejection. 37 C.F.R. § 41.37(c)(1)(iv).

OPINION

The Examiner's Rejection

The Examiner found Zhou discloses a method of forming a hollow profile that extends in a longitudinal direction according to claim 32 including impregnating continuous fibers with resin, consolidating the fibers in ribbon form, and pultruding the ribbon with second long discrete fibers in a second resin matrix, with the exception that Zhou discloses impregnating the plurality of continuous fibers with a thermoplastic matrix in a resin tank, rather than an extruder as recited in claim 32. Non-Final Act. 3–4. The Examiner found Shirai discloses an extruder where impregnation takes place in a cross-head die by pulling the fibers from a pultruding unit and resins

being supplied from an extruder as a thermoplastic resin melt. *Id.* at 4. The Examiner determined it would have been obvious to substitute the extruder in Shirai in place of the tank disclosed in Zhou as the source of the resin material that would allow uniform impregnation. *Id.*

Appellant's Contentions

Appellant argues Zhou discloses the second thermoplastic resin including the long fibers is combined with wetted filaments and thermoplastic resin before any consolidation to form a ribbon, which is the opposite of the method disclosed in claim 32. Appeal Br. 4–6. Appellant contends also Zhou does not disclose a pultruding step that is separate from and after a consolidating step as required by independent claim 32. *Id.* at 6.

Issue

The dispositive issue is:

Has Appellant identified reversible error in the Examiner's determination that Zhou discloses consolidating the impregnated fibers to form a first ribbon and providing long fibers separately from the first ribbon such that the pultruding step occurs after the consolidating step as recited in claim 32?

Discussion

We are not persuaded by Appellant's argument that Zhou fails to disclose consolidating impregnated fibers into a first ribbon and separately providing a plurality of long fibers through a die. Zhou discloses continuous fibers (filaments 1) are wetted with a first thermoplastic resin (14) and fed

into filament channels (16) in a cross head die (18), where the wetted filaments are then brought into contact with a second thermoplastic resin (22) containing long filaments. Zhou ¶¶ 22, 75, Fig. 1. In this regard, the Examiner found the impregnated fibers (1, 14) are consolidated into ribbon form in the entrance area of cross head die (18) prior to combining with the second thermoplastic resin (22) in the exit region of cross head die (18). Non-Final Act. 3; *see also* Ans. 6; and Zhou Fig. 2A.

We agree with and adopt the Examiner’s position, as it is sufficiently supported by the record. In addition to Figure 2A, Zhou discloses the filament channels (16) are configured to receive “one or more of the filaments 1 or bundles of filaments,” such that multiple wetted filaments come together and thus are consolidated in the filament channels (16) as they enter cross head die (18). Zhou ¶ 41. Moreover, Figure 5A of Zhou depicts the inlet flow of second thermoplastic resin (22) at the distal end (62) of the filament channels (16), which further supports the Examiner’s position that the long fibers contained within second thermoplastic resin (22) are provided to the die separately and after the impregnated fibers are consolidated to form a first ribbon. Zhou ¶ 44. For these reasons, Appellant’s argument is not persuasive.

We are unpersuaded by Appellant’s additional argument that there is no disclosure of a pultruding step separately from and after a consolidating step. Appeal Br. 6. To the extent Appellant’s argument is based on the lack of a consolidating step, we are not persuaded for the reasons discussed above. As to the disclosure of a pultruding step, Appellant has not addressed the Examiner’s findings that Zhou discloses a pultruding step near the exit of cross head die (18) to form the hollow profile via pulling section (44). Non-

Final Act. 3 (citing Zhou ¶ 23, Fig. 1). Accordingly, we are not persuaded by Appellant’s argument.

Therefore, we affirm the Examiner’s rejection of claims 32–34 and 37–43 as obvious over Zhou and Shirai.

Rejections 2–4

Regarding claims 35, 36, and 44–52, dependent from claim 32 and the subject of Rejections 2–4, Appellant does not separately argue these rejections, but rather relies on the arguments set forth for claim 32. Appeal Br. 6. Accordingly, we affirm the Examiner’s rejections for similar reasons as discussed above with respect to Rejection 1.

CONCLUSION

The Examiner’s rejections of claims 32–52 under 35 U.S.C. § 103(a) are affirmed.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
32–34, 37–43	103	Zhou, Shirai	32–34, 37–43	
35	103	Zhou, Shirai, Yokota	35	
36	103	Zhou, Shirai, Tong	36	
44–52	103	Zhou, Shirai, Edwards	44–52	

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Overall Outcome			32–52	
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TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED