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14/306,289	06/17/2014	SIMON PETER SCOTT	176467.01	4213
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OLIFF PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850			HICKS, ANGELISA	
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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* SIMON PETER SCOTT and CHRISTOPHER SUTCLIFFE

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Appeal 2019-005715  
Application 14/306,289  
Technology Center 3700

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Before EDWARD A. BROWN, CHARLES N. GREENHUT, and  
LEE L. STEPINA, *Administrative Patent Judges*.

STEPINA, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>1</sup> appeals from the Examiner's decision to reject claims 26–29, 31–36, 38–41, and 43–53.<sup>2</sup> We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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<sup>1</sup> We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies Renishaw, PLC as the real party in interest. Appeal Br. 1.

<sup>2</sup> A telephonic hearing was conducted on August 18, 2020.

CLAIMED SUBJECT MATTER

The claims are directed to systems for, and methods of, changing a particle filter used in an additive manufacturing process.

Claim 26, reproduced below with emphasis added, is illustrative of the claimed subject matter.

26. An additive manufacturing apparatus comprising:
- a build chamber,
  - a module for providing a focused energy beam for consolidating layer-by-layer powder material in the build chamber to build an article,
  - a gas flow circuit for passing a flow of gas through the build chamber during the manufacturing process, and
  - a filter assembly, the filter assembly comprising:
    - a filter housing having a gas inlet and a gas outlet both said gas inlet and said gas outlet being detachably coupled to the gas flow circuit such that the filter assembly is removably-mountable to the additive manufacturing apparatus,
    - a particulate filter element located within the filter housing between the gas inlet and the gas outlet and configured to filter at least one of volatile and explosive powder from the gas of the gas flow circuit,
    - a first valve actuatable to seal the gas inlet, and
    - a second valve actuatable to seal the gas outlet,
- wherein the filter housing is configured to allow liquid into the filter housing to flood the filter housing for entrapping the at least one of volatile and explosive powder held against the particulate filter element once the filter assembly has been removed from the additive manufacturing apparatus and is openable for removal of the particulate filter element, against which the at least one of volatile and explosive powder has been entrapped by the liquid, from the filter housing after flooding of the filter housing.*

Appeal Br. A-1 (Claims App.).

## REFERENCES

The prior art relied upon by the Examiner is:

<b>Name</b>	<b>Reference</b>	<b>Date</b>
Livoti	US 2,343,871	Mar. 14, 1944
Cornell	US 3,258,391	June 28, 1966
Cathcart	US 5,766,486	June 16, 1998
Jaikaran	US 5,772,879	June 30, 1998
Abe	US 2006/0192322 A1	Aug. 31, 2006
Pang	US 2009/0293988 A1	Dec. 3, 2009

Appellant submits a declaration by Chris Sutcliffe, hereinafter, the “Sutcliffe Declaration.”

## REJECTIONS

I. Claims 26–28, 32, 33, 35, 36, 38–41, and 43–47 are rejected under 35 U.S.C. § 103(a) as unpatentable over Jaikaran, Abe, and Cornell.

II. Claims 29 is rejected under 35 U.S.C. § 103(a) as unpatentable over Jaikaran, Abe, Cornell, and Cathcart.

III. Claims 31 and 34 are rejected under 35 U.S.C. § 103(a) as unpatentable over Jaikaran, Abe, Cornell, and Livoti.

IV. Claims 48–53 are rejected under 35 U.S.C. § 103(a) as unpatentable over Jaikaran, Abe, Cornell, and Pang.

OPINION

*Rejection I – Jaikaran, Abe, and Cornell*

*(Claims 26–28, 32, 33, 35, 36, 38–41, and 43–47)*

*Claims 26–28, 32, 33, 35, and 36*

The Examiner finds that Jaikaran discloses many of the elements recited in independent claim 26 related to the recited filter housing, but does not disclose (i) structure for the use of its filter housing in additive manufacturing and (ii) that the filter housing is configured to allow liquid into the filter housing to flood the filter housing for entrapping the at least one of volatile and explosive powder held against the particulate filter element once the filter assembly has been removed from the additive manufacturing apparatus. Final Act. 4–5. The Examiner relies on the teachings of Abe to remedy the deficiencies relating to limitation (i) above and relies on the teachings of Cornell to remedy the deficiencies relating to limitation (ii). *Id.* at 5–7. Specifically, with respect to Cornell, the Examiner finds “Cornell . . . teaches flooding or backwashing a filter that filters caustic materials, where caustic is volatile . . . in order to dilute the causticity of the material.” *Id.* at 6 (citing Cornell 4:72–75, 5:1–3, 25–26).

The Examiner reasons it would have been obvious “to modify the manner in which the filter is cleaned [in] Jaikaran with a flooding method as taught by Cornell . . . in order to dilute the causticity of the material.” *Id.* The Examiner concludes that Jaikaran, modified based on the teachings of Jaikaran as proposed, would result in structure configured in a way corresponding to limitation (ii). *Id.*

Appellant argues that Cornell’s disclosed washing process has nothing to do with entrapping volatile powder against a particular filter element, and, instead, Cornell uses its washing step to recover “white liquor” in a solid

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calcium carbonate cake Cornell uses for its process. Appeal Br. 19–20. Appellant argues “neither Jaikaran nor Abe is concerned with causticity.” *Id.* at 19. Thus, Appellant contends, any problem addressed by Cornell’s washing step is not present in the additive manufacturing industry, and, therefore, Cornell’s washing step does not provide any benefit to the structure resulting from the proposed combination of the teachings of Abe and Jaikaran. *Id.* at 20. The Sutcliffe Declaration echoes Appellant’s argument, stating

Cornell merely describes a washing step where water is applied across the entire surface of the solid cake in order to wash all of the cake and is passed through a filter cake. One of ordinary skill in the additive manufacturing would not understand this to correspond to allowing liquid into the filter housing to “flood” the filter housing for “entrapping” at least one of volatile and explosive powder, as claimed. As described in the specification, according to embodiments, a capsule is filled with water, and the water is retained within the capsule until a point later in time. *See, e.g.*, ¶¶[0009] and [0011]. It is clear that covering a solid with a liquid and drawing the liquid through the solid, such as is disclosed in Cornell, would not lead one of ordinary skill in the art of additive manufacturing to fill a filter cartridge with water.

Sutcliffe Declaration ¶ 23.

In response, the Examiner finds both of Jaikaran and Clark “deal with the removal of unwanted particulate.” Ans. 3. Further, the Examiner states, “Jaikaran discloses the housing and filter and is silent about a specific fluid to be filtered. Cornell deals with the handling of a specific fluid to be filtered (a caustic material). Therefore, the Jaikaran/Cornell combination results is a filter housing (Jaikaran) that is flooded (Cornell) in order to reduce causticity within the filter housing (Cornell). As a result, there is a reason to combine.” *Id.* at 3–4. The Examiner states, “[i]t is not beyond the

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veil of possibility to a person having ordinary skill in the art at the time of the invention to utilize a caustic material during this process.” *Id.* at 4. The Examiner also finds that Abe disclose the use of iron powder, and this material can be combined with oxygen to produce ferrous oxide, which, the Examiner finds, is highly flammable. *Id.* Thus, according to the Examiner, a person of ordinary skill in the art would have had a reason to eliminate a material (ferrous oxide) in the apparatus described by Abe. *Id.*

In reply, Appellant reiterates that neither Abe nor Jaikaran is concerned with causticity of material. Reply Br. 5. Appellant states that a determination of whether something is “beyond the veil of possibility” is not the proper inquiry for determining obviousness. *Id.* Appellant also argues that Cornell is unrelated to the problem of oxidation of particles when they are exposed to air. *Id.*

Appellant has the better position. Neither Jaikaran nor Abe is concerned with neutralizing volatile (or caustic) particles. Further, as stated by Appellant, Cornell is concerned with recovery of white liquor in a paper-making process, and this process is unrelated to (i) additive manufacturing processes, (ii) entrapment of particles on a filter, and (iii) dilution of caustic materials on a filter. It appears that the benefit of “diluting the causticity” of material in the filter comes only from Appellant’s disclosure. In this regard, the Examiner’s finding that a person of ordinary skill in the art might use caustic material while practicing the process disclosed by Abe, i.e., that this occurrence “is not beyond the veil of possibility” (Ans. 4) amounts to speculation and, therefore, does not buttress the Examiner’s reasoning. Accordingly, we agree with Appellant that the Examiner’s rationale for providing structure in the combination of Jaikaran and Abe’s teachings to “flood” the filter housing based on the teachings of Cornell (*see* Final Act.

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6) is not supported by rational underpinnings and is, instead, based on impermissible hindsight. Therefore, we do not sustain the rejection of claim 26, and claims 27, 28, 32, 33, 35, and 36 depending therefrom, as unpatentable over Jaikaran, Abe, and Cornell.

*Claims 38–41 and 43–47*

The Examiner relies on substantially the same findings of fact and reasoning regarding Cornell in the rejection of claims 38–41 and 43–47. *See* Final Act. 8–12. Accordingly, for the same reasons, we do not sustain the rejection of these claims as unpatentable over Jaikaran, Abe, and Cornell.

*Rejections II–IV–Jaikaran, Abe, Cornell, Cathcart, Livoti, and Pang*

*(Claims 29, 31, 34, 48–53)*

The Examiner does not use the teachings of Cathcart, Livoti, and Pang in any manner that would remedy the deficiency discussed above regarding Rejection I. Accordingly, for the same reasons, we do not sustain Rejections II–IV.

## CONCLUSION

The Examiner's rejections are reversed.

## DECISION SUMMARY

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
26–28, 32, 33, 35, 36, 38–41, 43–47	103(a)	Jaikaran, Abe, Cornell		26–28, 32, 33, 35, 36, 38–41, 43–47
29	103(a)	Jaikaran, Abe, Cornell, Cathcart		29
31, 34	103(a)	Jaikaran, Abe, Cornell, Livoti		31, 34
48–53	103(a)	Jaikaran, Abe, Cornell, Pang		48–53
<b>Overall Outcome</b>				26–29, 31–36, 38–41, 43–53

REVERSED