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BakerHostetler / Facebook Cira Centre 12th Floor 2929 Arch Street Philadelphia, PA 19104-2891			WHITAKER, ANDREW B	
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* IDO WAKRAT, TAO CUI BAECKLUND,  
JUAN FELIPE COIROLO TESTA, and DMITRY KOTEROV

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Appeal 2020-002802  
Application 15/476,725  
Technology Center 3600

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Before ST. JOHN COURTENAY III, LARRY J. HUME, and  
PHILLIP A. BENNETT, *Administrative Patent Judges*.

BENNETT, *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 1, 5–11, and 15–20, which are all of the claims pending in this application. Claims 2–4 and 12–14 have been cancelled. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

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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(a). Appellant identifies the real party in interest as Facebook, Inc. Appeal Br. 2.

### CLAIMED SUBJECT MATTER

The claims are directed to customizing content items by filtering a matrix of temporal values. Spec. ¶ 1. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A method comprising:

receiving, by a processor of an online system from a third party system, (i) a matrix of temporal values for a plurality of lodgings, each temporal value of the matrix of temporal values corresponding to at least a start date and an end date and (ii) one or more parameters describing the plurality of lodgings;

determining, by the processor of the online system, a target start date and a target end date for a user of the online system responsive to at least one action performed by the user;

determining, by the processor of the online system, a subset of temporal values by filtering the matrix of temporal values for temporal values having a corresponding start date and corresponding end date matching the target start date and the target end date, respectively;

determining, by the processor of the online system, a subset of lodgings of the plurality of lodgings, wherein each lodging of the subset of lodgings corresponds to at least one of the subset of temporal values;

retrieving, from a data store of the online system, actions performed by the user on the online system or the third party system;

for each lodging of the subset of lodgings, generating, by the processor of the online system, a likelihood that the user will select the lodging by:

extracting feature vectors from the retrieved actions performed by the user and the corresponding one or more parameters of the lodging for a machine learning model trained by:

deriving feature vectors from various content items and from actions performed by a plurality of other users of the online system with the content items, and

training the machine learning model by using the derived feature vectors, and

inputting the extracted feature vectors into the machine learning model, the machine learning model outputting the likelihood that the user will select the lodging;

selecting, by the processor of the online system, a lodging of the plurality of lodgings based on the generated likelihoods; and

providing a content item for presentation on a client device of the user, wherein the content item includes the corresponding temporal value of the subset of temporal values of the selected lodging.

Appeal Br. 17–18 (Claims App.).

#### REFERENCES

The prior art relied upon by the Examiner as evidence is:

Name	Reference	Date
Krishnareddy et al.	US 2013/0006777 A1	Jan. 3, 2013
Fishberg	US 2016/0225108 A1	Aug. 4, 2016
Zhang et al.	US 2017/0048664 A1	Feb. 16, 2017

#### REJECTIONS<sup>2</sup>

Claims 1, 5, 7–11, 15, and 17–20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Fishberg and Zhang. Final Act. 8.

Claims 6 and 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Fishberg, Zhang and Krishnareddy. Final Act. 13.

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<sup>2</sup> The Examiner has withdrawn the rejection of claims 1, 5–11, and 15–20 under 35 U.S.C. § 101. Ans. 3.

## ISSUE

Issue: Has the Examiner erred in finding Fishberg and Zhang teach or suggest:

for each lodging of the subset of lodgings, generating, by the processor of the online system, a likelihood that the user will select the lodging by:

extracting feature vectors from the retrieved actions performed by the user and the corresponding one or more parameters of the lodging for a machine learning model trained by:

*deriving feature vectors from various content items and from actions performed by a plurality of other users of the online system with the content items, and training the machine learning model by using the derived feature vectors,*

as recited in claim 1?

## ANALYSIS

The Examiner rejects claim 1 as obvious over Fishberg and Zhang. The Examiner finds that Fishberg teaches most of the limitations of claim 1, but states that

[Fishberg] does not expressly teach *for each lodging of the subset of lodgings, generating, by the processor of the online system, a likelihood that the user will select the lodging by: extracting feature vectors from the retrieved actions performed by the user and the corresponding one or more parameters of the lodging for a machine learning model trained by: deriving feature vectors from various content items and from actions performed by a plurality of other users of the online system with the content items, and training the machine learning model by using the derived feature vectors, and inputting the extracted feature vectors into the machine learning model, the machine learning model outputting the likelihood that the user will select the lodging; selecting, by the processor of the online system, a lodging of the plurality of lodgings based on the generated likelihoods.*

Final Act. 10. The Examiner cites Zhang to address this deficiency. *Id.* at 10–11 (citing Zhang ¶¶ 51–59, 80–81).

Appellant asserts that Zhang’s teachings are deficient because:

[T]he claimed machine learning model is also different from the coefficient taught in Zhang because the claimed model is trained based on feature vectors derived from various content items. This allows for a more robust model for use in the particular application that relates to serving the most temporally-relevant content about lodgings to users. Zhang does not teach or suggest the step of (or the sub-steps under) generating a likelihood of a user selecting a lodging by using a machine learning model trained based on ‘feature vectors from various content items and from actions performed by a plurality of other users of the online system with the content items,’ as recited in claim 1.

Appeal Br. 15. Furthermore, Appellant argues “[t]he machine learning model in claim 1 is trained based on feature vectors derived from various content items and actions performed by other users with the content items. In contrast, Zhang's models are generated merely based on the target user’s information (e.g., the user looking for lodgings) but not based on other users’ information and other content items and actions on those other items.” Appeal Br. 14 (emphasis omitted).

We are not persuaded by Appellant’s arguments because we agree with the Examiner that Zhang teaches or at least suggests the disputed limitations. We emphasize that the standard for determining whether a claim is obvious is “an expansive and flexible approach.” *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 415 (2007). Zhang’s vector or model that is created based on collected information of what may be of interest to the user (¶ 59) combined with Zhang’s social networking system 160 determining coefficients using machine-learning algorithms trained on historical actions and past user responses, or *data farmed from users* by

exposing them to various options and measuring responses (Zhang ¶ 81), teaches or at least suggests the limitation “*deriving feature vectors from various content items and from actions performed by a plurality of other users of the online system with the content items, and training the machine learning model by using the derived feature vectors.*” That is, we find Zhang’s users teach or at least suggest “a plurality of other users” as the source of “various content items” as recited in the disputed limitation of claim 1. We agree with the Examiner that in light of the teachings of Zhang, a person of ordinary skill in the art would have found it obvious to derive feature vectors from actions performed by a plurality of other users of the online system with the content items. Ans. 4–5.

We, therefore, disagree with Appellant’s argument that the cited references fail to teach or otherwise the disputed limitation and we sustain the rejection of claim 1. Appellant does not present separate arguments on independent claim 11 or dependent claims 5, 7–10, 14, 15, and 17–20. Arguments not made are waived. Accordingly, we affirm the Examiner’s obviousness rejection of claims 5, 7–10, 14, 15, and 17–20.

Appellant does not present arguments on the Examiner’s obviousness rejection of claims 6 and 16 over the combination of Fishberg, Zhang, and Krishnareddy and we affirm the Examiner’s rejection of these claims also.

## CONCLUSION

We affirm the Examiner’s rejections under 35 U.S.C. § 103.

DECISION SUMMARY

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Reference(s)/Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 5, 7-11, 15, 17-20	103	Fishberg, Zhang	1, 5, 7-11, 15, 17-20	
6, 16	103	Fishberg, Zhang, Krishnareddy	6, 16	
<b>Overall Outcome</b>			1, 5-11, 15-20	

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)(1)(iv). *See* 37 C.F.R. § 41.50(f).

AFFIRMED